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Urban Relational Spaces: Spatiotemporal Patterns of Everyday Life

HABILITATION THESIS

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Preface

The habilitation thesis is organized into two main parts. Part 1 provides an introductory contextualization of the specific research issues concerning spatiotemporal routines and their roles in shaping the production and representation of urban space. The introduction to Part 1 outlines the broadly formulated research questions framing the aims and thematic orientation of the individual papers included in this habilitation thesis. Subsequent sections of this part present the theoretical foundations, methodological approaches, and fields of application relevant to the study. Attention is paid here to the discussion of the phenomenon of everyday urban life, from a geographical perspective of relational space and time. Urban everyday timespaces are approached primarily through the lens of mobilities and stabilized rhythms of routine practices. This section also explores the representation of ordinary urban realities both at the level of individual networks of relationships and within broader planning schemes and urban policies. The concluding chapters of Part 1 describe selected methodological tools, procedures and resources relevant to operationalizing theoretical concepts presented, while also considering possible future directions for research on everyday urban life.

Part 2 comprises an overview and brief characterization of the eleven papers included in the supplements to the habilitation thesis. This section is structured in three thematic blocks, with each block introducing and briefly discussing papers that share a common research perspective, conceptualization of the problem, and, to some extent, methodological framework. The first block includes three papers that draw largely on commuting flow analysis to investigate daily urban systems within various relational configurations of settlement space. The subsequent section summarizes five texts linked by a focus on the role of time and temporality in forming networks of urban daily relations and rhythms. The final section of Part 2 features three texts that primarily use qualitative methodologies to capture the perception, imagination, and representation of lived timespace.

The majority of the papers are closely aligned with the scientific activities of Time, Rhythms and Mobility Research Group at the Department of Geography, Masaryk University. Concurrently, these papers reflect the research topics addressed by various basic research or applied projects funded by the Czech Science Foundation (*Transformations in Czech urban and regional system: from hierarchial organization to polycentric settlement* 2013–2015; *Geography of urban rhythms* 2014–2015; *Mapping everydayness: representation of routine spaces* 2017–2018; *Spatial injustice of automobility technologies* 2017–2019; *Compact and polycentric urban forms: Conflicting spatial imaginations? 2020–2022*), Technology Agency of the Czech Republic (*Modelling the daily dynamics of the number of people present in urban space 2021–2022*) or by European Spatial Planning Observation Network ESPON (*POLYCE* 2010–2012; *TOWN* 2012–2014).

PART 1

1. Introduction

1.1 Framing Themes

This thesis explores several general themes and broader research concepts that run through all the texts included. Rather than being self-contained theoretical fields, these themes form an interlinked ontological and epistemological scheme that integrates disparate research questions and discourses into a coherent framework. The central research areas, as referenced in the thesis title – everyday life and relational (time)space – provide a broad backdrop to the specific topics addressed in the research papers. The term *everyday life* is employed here to designate a complex continuum of practices pertaining to specific material arrangements, specific places and specific times. These practices are often synchronized and synchorized into collective patterns, co-defining the spatiotemporal scale and rhythms of the lived world. Given its fluid and multidimensional nature, the everyday life is not treated here as straightforward theoretical concept. Instead, it is approached more pragmatically, functioning as a conceptual guideline that directs the geographic inquiry towards mundane, repetitive and habitual processes and practices.

Everyday life is undoubtedly a relational phenomenon. The ordinary routines represent the place-path arrays (Schatzki, 2010b) that are internally linked through various types of relations, which are articulated more or less clearly in/via geographic space. Everydayness is constituted by sequences of places and performances, which are orchestrated by the relations between humans, material artefacts and collectively shared rhythms. Examples include the home-work nexus, materialized in various forms of commuting, or banal, repetitive activities such as picking up children from school or shopping in a hypermarket. These routines require coordination with other individuals, schedules and opening hours. The conceptualization of space and time as relational, non-substantival entities offers a novel opportunity to transcend the constraints of traditional Euclidean geometry and to capture the multiplicity of perceived, lived and planned spaces. However, as Harvey (1996) or Jones (2009) have observed, a caution is required when translating the abstract theory of relational thinking into the analysis of concrete cases of spatiotemporal organisation. A key challenge in this respect is the vagueness and excessive emphasis on flows and fluidity. Given these limitations, this thesis adheres to the so-called realistic reading of relational space. The presented knowledge about space is primarily based on facts '*about material bodies and the way they are related*' (Jones, 2009, 496), with less emphasis on facts '*about ... patterns of sensory experience*' (ibid.). The relational approach is employed in order to focus more on relationships and processes than on objects and forms (Graham and Healey, 1999).

There is considerable variation in everyday practices, which may be either intimate or public, personal or collective, private or public, symbolic or material, purely bodily or technologically mediated. The texts incorporated in the thesis are primarily concerned with those repetitive practices, which are collective and shared by the *series* of individuals (Ellegård, 1999) and which have the power to produce stabilized (or even institutionalized) timespaces. The research therefore focuses on visible and tangible aggregations, i.e. materialized patterns and rhythms that act as spatial and temporal infrastructures of everyday life (Dourish and Bell, 2007). This research scope differs only in the case of the two texts (papers 9 and 10), which examine individual routine timespaces and the internal logic of their arrangements.

1.2 Research Questions

As stated in the preface, the core of this thesis comprises a collection of eleven research papers. Each paper constitutes a distinct and internally cohesive study, presenting unique research insights, aims, and questions. Despite their diversity, these papers are unified under several overarching research perspectives, forming an internally consistent whole. Three broad lines of inquiry underpin the individual studies – these lines can be interpreted as general research questions framing longer-term research trajectory.

The first line of inquiry focuses on the spatiality of everyday routines. Here, the term spatiality refers to the synchronic organization of embodied activities and movements, to their '*coexistence within the structure*' (Laclau in Massey, 2005, 43). This understanding of everyday relational space is primarily informed by an analysis of job commuting flows, which are treated as a somewhat simplified approximation of the complex relations that shape urban system. These flows produce non-isotropic relational space – represented by specific configurations of interlinked places, that are contextualized as local labour systems, complex micro-regions or functional urban areas. Specific research questions examine the geographic extent, magnitude (number of inhabitants or jobs) and internal structure (centralities, hierarchies) of those configurations. There are more general issues underlying and framing these particular questions. What is the scale of everyday routine? What processes and activities produce the scalar level of everyday life? What are the typical spatial patterns of individual daily movements? What kinds of centralities can be identified and defined within the networks of relational space?

The second research line is aligned with Felski's assertion that '*everyday life is above all a temporal term*' (Felski, 1999, 18). This research addresses two pivotal elements of everyday temporality: repetition and timing. The ontological relevance of categories such as, for example, neighbourhood, city centre or functional urban region is largely contingent upon the repetitive nature of numerous everyday practices. It is the cyclicality of these practices – not their singularity – that enables the routinization and materialization of everydayness in space and time. In this context, timing refers to the intricate interrelationships between practices, places and times, or, in other words, to the specific synchronisation and synchorisation strategies that underpin these interactions. Repetitive and semiregularly timed practices represent an important spatiotemporal infrastructure of everyday life which is not easy to be conceptualized and analytically grasped. Concepts of pacemakers (Parkes and Thrift, 1979; Hägestrand, 1982), rhythmanalysis (Lefebvre, 2004), chronotope (Bakhtin, 1981; Crang, 2001) and chronopolis (Laguerre, 2004; Osman and Mulíček, 2017) have been employed to explore questions surrounding the production of urban places. Central to this inquiry are questions such as: What roles do rhythm, timing, and repetition play in the materialization and organization of diverse urban spatiotemporal ensembles? What are the mechanisms and modalities of spatiotemporal negotiation and coordination?

The third line of inquiry examines the situatedness and embeddedness of everyday routines within broader social contexts. The individual practices occur within an experiential timespace, which is shaped by various factors, including habitual codes, appropriated mundane technologies and shared narratives. These factors have a significant impact on the ways in which space and time are perceived by individuals, represented within their spatiotemporal tactics and eventually become institutionalized in the form of policies, plans and regulations. The research focus is therefore primarily concerned with the issues of spatiotemporal reasoning and representation. In the relevant research texts included in the thesis, these themes are explored in diverse contexts with regard to the actors involved (wheelchairs users, older adults) and the scale of analysis (individual activity spaces, regional and national planning spaces). At a broader level, the research questions seek to investigate how the experiential timespace is translated into embodied routines and movements, how normative narratives are transformed in the contexts of everyday life, how

the scale of everydayness is produced, and what representations of timespace are associated with various actors and socio-technical ensembles.

In conclusion, this brief overview of the research questions highlights common denominators across the papers included in the thesis. These can be broadly categorized as follows: the production of semi-permanent perceived, represented and materialized structures in/of space and time; the repetitive and regular nature of movement, communication and dislocation processes; and the role these processes play in linking specific places, times, actors and artefacts into distinct spatiotemporal ensembles.

2. Everyday Life: A Geographical Perspective

2.1 Approaching Everydayness

As several scholars have noted, the everyday has been a frequent subject of research interest since the nineteenth century (Crook, 1998; Felski, 1999). At the same time, the everyday has always been difficult to conceptualize, given its inherently multidimensional and interdisciplinary nature. Multidimensionality refers to the fact that there can be hardly found activities and practices without any relation to everyday life (Burkitt, 2004). Interdisciplinarity points to the long-standing exploration of everyday life not only within the realms of philosophy and sociology but also from the perspectives of disciplines such as history, geography, and cultural and technology studies (Gardiner, 2000; van Loon 2002). The range of approaches to analysing everyday practices, whether corporeal, material or virtual, is thus vast, with each emphasizing different aspects of repetitiveness, routinization, normativity, totality and domestication.

The geographical research perspective addresses primarily the spatialized and temporalized context of everyday practices (Schatzki, 2010b). This involves more than simply localizing practices in space and time. Spatialization and temporalization refer to mutually constitutive relationship between space, time and everyday practice (Dourish and Bell, 2007). These terms highlight the reciprocal relations between the structure of timespace, coordinated practices and their collectively shared meanings. Schatzki, in this respect, defines practices as '*organized spatial-temporal manifolds of human activity*' that are orchestrated through shared '*understandings, rules, and normative teleologies*' (Schatzki2010a, 129). While individual lives also contain non-organized, exceptional, or singular activities, geographical approaches to the everyday primarily concern themselves with the spatiotemporal structures that emerge from repetitive collective practices. The numerous cycles of synchorized and synchronized activities delineate a stable frame of reference to which individual everyday tactics can be compared, and which can be tied to specific periods of linear historic time.

Repetitiveness appears to be a defining feature of everyday life. According to Anderson (2016), the essence of the everyday becomes most visible when some form of emergency interrupts the atmosphere of mundane repetition. Czech philosopher Karel Kosík states that '*everyday is above all the organizing of peoples' individual lives into every day: the replicability of their life functions is fixed in ... the time schedule of every day*' (Kosík, 1966, 53). Kosík emphasises here the stable pattern of the countless cycles of working, acting and living. This pattern functions as a referential infrastructure (Dourish and Bell, 2007), a taken-for-granted world in which the individual biographies unfold. However, the repetitiveness of everyday is not monolithic. Cyclicity should not be confused with circularity (Šrubař, 2001). As Kosík (1966), Adam (1990) or Felski (1999) demonstrate, the recurrence of routine everyday activities interplay in many ways with the perceived linearity of individual life histories (such as aging) as well as with the development of *longue durée* societal or sociotechnical structures. In other words, everyday life encompasses multiple temporalities, and while repetitiveness is a crucial organizing principle, it is not the only one.

The daily life of contemporary societies is, to a greater or lesser extent, a collective phenomenon. As Schatzki observes, '*individual human existence...is not merely being-in-the-world but being-in-the-world with others*' (Schatzki, 2010b, 47). However, co-presence with others can take various forms. Employing Sartrian terminology, individuals can be members of specific *series* or specific *group* of humans (Sartre, 2004). In the case of seriality, it is typically a practice or a common interest that unites individuals into distinct collective structures (see Figure 1). For instance, the practice of commuting forms collectives of people regularly moving between home and work,

driving cars or standing at the bus stops. Similarly, practices such as watching TV, shopping or travelling produce ensembles of relatively isolated and anonymous individuals that have little in common except the particular interest linked usually to particular time or space (Ellegård, 1999). By contrast, Sartrian groups consist of members who know one another, are interlinked by reciprocal relations and collectively involved in a more complex project (see Figure 1). Examples include families, work groups, or sports clubs, which are internally interdependent collectives, in which individuals assume specific roles. In reality, however, there is no clear dividing line between series and groups. Members of both categories usually share intersubjective meanings and symbolisms that are frequently taken for granted within a given spatiotemporal or social order (Michael, 2006).

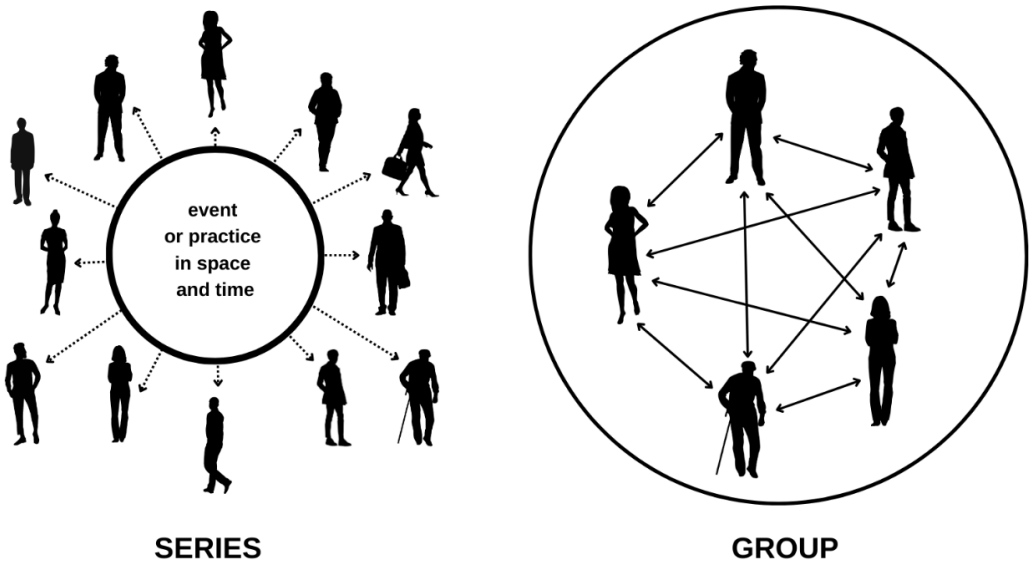


Figure 1: *Visual diagram of series and group logic*

The collective nature of everyday life raises important questions about coexistence, coordination and orchestration, particularly concerning spatial and temporal ordering. The individual timespaces are not fully autonomous. Instead, they are shaped by various norms and conventions, both institutionalized and informal, as well as by material settings and the intervening practices of present or absent others. The series of commuters can be then viewed as spatiotemporal co-product of orchestration which confronts individual projects with normative structures such as workhours, public transport timetables, retail opening hours, school schedules and lunch breaks. Timespaces often fuse together, becoming shared and negotiated, especially within the collectives of *group* type. For instance, family timespace exemplifies such precise coordination between the members with different roles and schedules. Shove (2009) draws the attention to the importance of routines in everyday synchronization and synchorization based on embedded conventions of timing, sequencing and duration of particular practices. Routines, along with technologies of mechanical time (e.g. watches, calendars), represent an infrastructure that enables the effective everyday coordination of numerous individual practices across time and space.

Everyday practices take place within specific material arrangements, and they simultaneously constitute and transform these arrangements. Schatzki (2010a, 130) refers to this as '*practice-*

arrangement nexuses', highlighting the reciprocal relationship between practices and their material environment. In a similar sense, Viderman et al. (2023) describe settled urban space as a material sediment of diverse practices. The mundane materiality of the lived world, often neglected in social sciences, interplays in many ways with embodied routines. Bodily being in the world (Harvey, 1996), corporeal practices and experiences are the essence of everyday life, the metrics of which are based on capacities and constraints of human body. The individual body is a basic measure of lived space and time (Gosden and Kirsanow, 2006), an instrument enabling movement and defining the spatiotemporal scale of everyday activities (Herod, 2011). There is a number of technological systems that extend the body's capabilities – the technologies like shoes, refrigerator, car or cell phone have the power to reshape the relation between self, bodily practice and material arrangements (Crang and Thrift, 2000). These technologies not only transform individual timespaces but also alter the ways of collective coordination (Schwanen et al., 2008). In contemporary society, information and communication technologies (ICTs) have the most profound impact on how space and time are experienced in daily life. Multi-layered processes of delocalization, multilocalization and decorporealization redefine the subtle ties between embodied practices and their usual places and times (Caron and Caronia, 2007; Jensen, 2009, Couclelis, 2009).

2.2 Relational Space and Time

Space and time are understood as generally unproblematic and self-evident frameworks of everyday life. Euro-American common-sense predominantly relies on seemingly natural ideas of Euclidean space containing objects (Law, 2002) and an irreversible flow of time (Bergmann, 1992). This viewpoint then implies space as a coexistence of things at the same time, while time can be viewed as a succession of things in a given space (Crang, 2005). Hägerstrand's time-geography offers an example of this perspective, treating space and time as containers or axes – abstract notation systems that pinpoint the individuals and events to specific spatial and temporal coordinates (Ellegård and Svedin, 2012). The perceived taken-for-grantedness of both categories however often obscures their complicated nature, their multiplicity, contextuality and intervoweness.

Beyond the linear, mechanical time of clocks and the uniform, abstract space represented in maps, there is a multiplicity of other social times and spaces constituted through the manifold of practices. May and Thrift (2001) argue that various cultural practices of/in space and time result in a diversity of spatiotemporal configurations. Space and time can be studied separately as isolated categories on the pure analytical level, as far as the space is approached as a static synchrony. However, once we conceptualise space as '*an open ongoing production*' (Massey, 2005, 55) stemming from practice, the incorporation of some kind of temporality seems to be inevitable. The most of routine practices repetitively couple specific locales with specific times and, at the same time, prescribe the successive sequences of this couplings (producing specific rhythmicity). Although many routines are measured relative to the flow of mechanical time *chronos*, they essentially represent *kairotopos* – the subjectively meaningful interrelation between meaningful spatial and temporal settings (Rämö, 1999). In this view, events occur in space and time, and, viewed from the standpoint of routine ordinary life, space and time are embedded in events (Adam, 1990).

There are spaces and times of work differing from those of being home, the spaces and times of commuting, those of shopping as well as numerous other space-time couplings in everyday life. Massey (2005, 179) suggests:

> '*Each of these time-spaces is relational. Each is constructed out of the articulation of trajectories. But in each case too the range of trajectories which is allowed in is carefully controlled. And each time-space, too, is continually shifting in its construction, being renegotiated.*'

However, in what ways are timespaces relational, controlled and renegotiated? The answers to this question can be found in the theory of social construction of space and time. This concept does not imply the subjectivization of space and time (Harvey, 1994). Rather, it refers to the constitutive power of processes and practices, specifically the reciprocal relationship between collective understanding of certain practices and their corresponding spacing/timing (Burkitt, 2004). This interplay establishes meaningful social timespace in its supra-individual dimension. For example, the timespace of blue-collar workers integrates early morning and early afternoon hours with locations such as bus and railway stations, newspaper stands, buffets, public transport vehicles and stops. The working practice of managers link diverse segments of day and evening time predominantly to the locales of offices, meeting rooms, roads, company cars and lunch restaurants. These are examples of collectively constructed and, to some extent, accepted and normalized configurations. However, the bonds between specific times and specific places are subject to somewhat contradictory processes: on the one hand, there is institutionalization (Zerubavel, 1981), while on the other hand, there is ongoing negotiation (Harvey, 1996). As a result, the particular timespaces are typically well-defined but not rigid structures. Blurring the boundaries between working and family time, the shift of typical day-time activities into the later night hours, and the erosion of 9-17 work-time model with the rise of nomadic workers can be seen as examples of permeability and flexibility of individual timespaces.

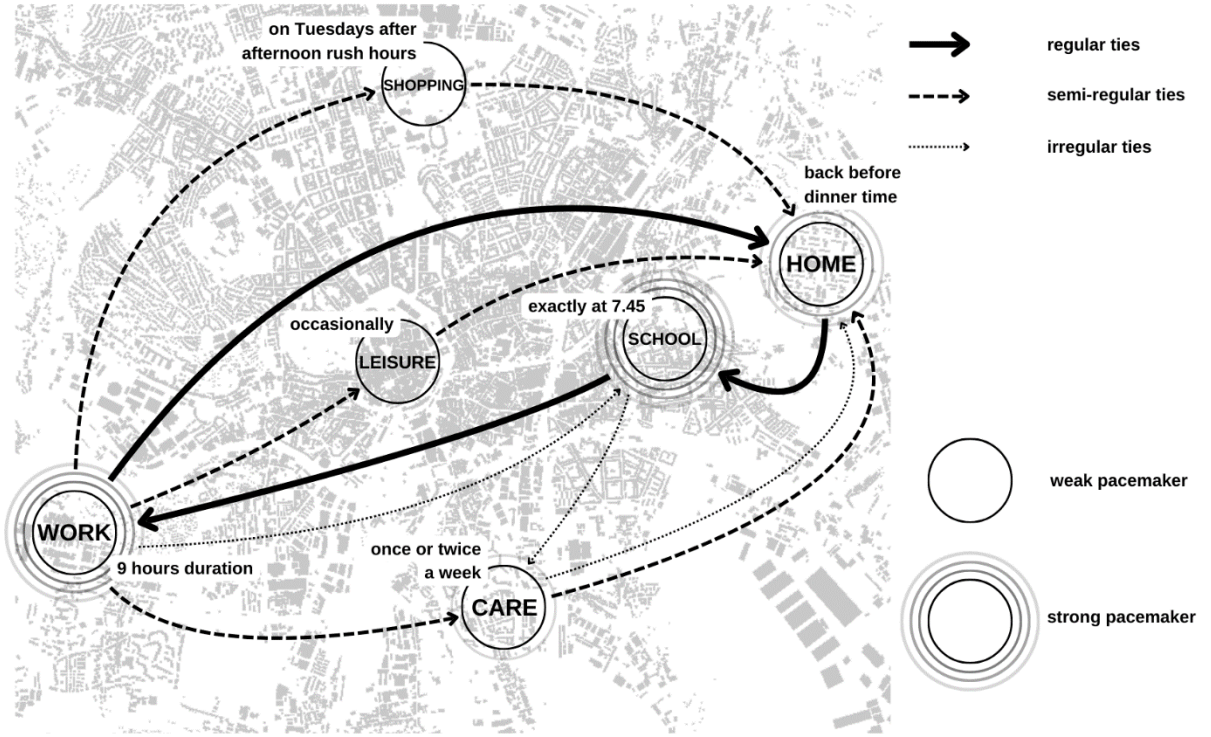


Figure 2: *A fictional example of a typical spatiotemporal network of an employed woman with a school-age child and caring for partially dependent parents*

In his interpretation of actor-network theory, Murdoch argues that space and time '*are constructed within networks; they are made out of relations of various kinds*' (Murdoch, 2006, 73). He further suggests that networks gather '*diverse places and times within common frame of reference and calculation*' (Murdoch, 1998, 360). The notion on networks brings us to the issue of spatiotemporal coordination of mobiles (Law, 2002) – actors that move, interact and communicate within a given network topology. Such coordination and ordering are conditional on sharing and negotiating spatiotemporal metrics and categories across the network. Some networks are deeply formalized, well-coordinated and long-lasting representing durable spatiotemporal patterns. They often function as institutions or superstructures producing *spaces of prescription* (Murdoch, 1998) defined by internal norms, semiotics and tools of surveillance (Giddens, 1984; Harvey, 1996). The temporality of these networks is usually controlled by dominant pacemakers and markers (Parkes and Thrift, 1975) with differentiated spatial and social reach. Being an employee, a member of the family, a patient in the hospital or a regular commuter involves participating in networks that impose strict spatiotemporal frames with reduced *fields of possibilities* (Schatzki, 2010a). At the same time, many short-term and loosely structured networks are part of everyday routines. These more flexible and negotiated networks often lack strict or stable fixation in space and time. Such arrangements often operate outside *proper places at the proper times*, simultaneously respecting and eroding the coercive role of institutionalized superstructures (see Figure 2).

Using the network metaphor to describe relational timespaces draws attention to the topological representations of routine spatiotemporal relations, particularly within poststructuralist geographies. As Allen (2011, 284) notes, topological landscapes '*may be 'folded' by the 'plaiting' of time into space*'. A topological approach enables to capture the relations not only between actors present in space, but also between those present in time. This is because post-mathematical topology deals with categories of proximity and distance that lack the system of *external*, e.g. Euklidean, metric (Martin and Secor, 2014). Instead, these categories are function of ontological relationships between diverse human and non-human actors with different capacities to configure presences and absences in space and time (Mol and Law, 1994; Latham, 2011). Strong actors and pacemakers can curve and fold the social timespace of the network in which internal, often qualitative reasoning of proximity and duration emerge. Mol and Law (1994) points out that the social inhabits multiple topologies, each with its own *internal metrics*. As a result, intuitive spatiotemporal categories (e.g. close/far, short/long, early/late, etc.) develop differently for various actors. The spatiotemporal reasoning of a productive-age man will differ from that of an older retired woman or from those related to the networked topologies of urban-planning agencies. Specific networks and topologies overlap, conjoin and conflict, producing clusters and regions of activities, which can be, at least temporarily, fixed and represented topographically.

2.3 Timespaces of Urban Everyday Mobilities

Habilitation thesis situates the themes of everyday life in an urban environment that can be understood as a condensed and complicated configuration of relational networks. Mike Crang (2001, 190) depicts the city as '*a becoming, through circulation, combination and recombination of people and things*'. This quotation is just one of many that challenge the static image of urbanity, instead introducing the notion of everyday city as open to fluidity, transitivity and mobility. Thus, when speaking of urban relational spaces, we implicitly assume their strong connection to various forms of mobile subjects. However, moving beyond a static view of cities and metropolitan areas does not imply a total absence of structure and stability. As Amin and Thrift (2002) suggest, numerous, often hidden, ordering systems and systematizing networks exist within urban life. Many of these are closely associated with the repetitive practices of various urban actors and their

recurrent spatiotemporal patterns. The seemingly chaotic urban flux is thus underpinned by sync processes within and between multiple networks that shape urban becoming and produce distinct urban rhythms. Together with Crang (2012) or Michon (2020) we can speak of temporal ecologies that, through various rhythms – from purely individual to fully institutionalized – link times, places and different forms of relevant materialities into meaningful wholes. Similarly, Chen (2017) describes rhythms as constellations of social agents, non-hierarchical topologies involving different sites of rhythmic production. The nature and meaning of attributes that ontologically define a particular urban entity can change repeatedly over time. It is the rhythmic regularity of this change that provides a degree of ontological security in the mundane urban life (Nevejan and Sefkatli, 2020).

Viewing urbanity through rhythms necessarily turns research attention to the issues of mobility and flows (Cresswell, 2010). As Edensor (2010) suggests, the various forms of movement generate rhythms that are observable in a particular place or area. Geographically relevant urban rhythms generally emerge from the alternating presence and absence of people and objects, reflected in the varying speeds or volumes of their flows and in the differing lengths of stasis. In other words, any place-based rhythm is defined by the change brought about by movement between and through places. The recurrent nature of this change can vary in scale: urban polyrhythmia consists of plethora of micro-scale alterations (e.g. periodic clusters of passengers at public transport stops), recurring movements that affect the broader urban scene (e.g. morning and afternoon rush hour traffic, regular departures of city residents on weekends) as well as the overarching seasonal rhythms of holidays or city mega-events. A number of geographical studies of urban rhythmicity, including those presented in this thesis, are based on the analysis of commuting and other forms of regular or semi-regular circulation. Liu et al. (2021) define (predominantly in the context of contemporary Euro-American city) five basic areas of human activity that generate dynamic urban space, i.e. space animated by more or less regular mobility practices – home returning, school-commuting, commuting, consuming and business activities. This categorization certainly does not capture the full diversity of urban flows, but it does at least attempt to identify the most frequent fields of possibilities from which different types of rhythmanalysis draw empirical mobility data. Commuting and consuming, for instance, can be seen as relatively autonomous networks that allow for the decomposition of the complex rhythm of the entire city into empirically graspable sub-units.

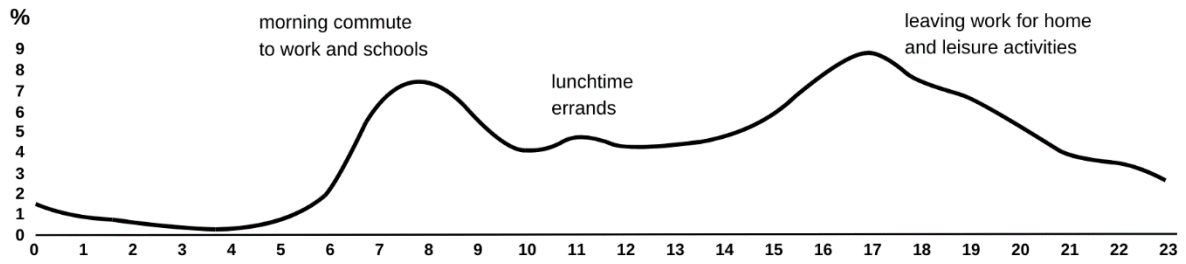


Figure 3: *Distribution of shared bike trips during the working day in Brno in 2022 (ReKola and Nextbike, 2022; own elaboration)*

However, mobility itself is not the source of rhythm, but merely an observable symptom of it. Knowles (2011, 138) notes in this regard that '*the tangles of mobilities composing the social world*

have their own trajectories, geographies and connections, and they move at different velocities and through quite different logics'. Investigating mobility logics leads us back to the broader issue of practices taking place in urban space and time, or more precisely, to how mobility is incorporated into these practices (see Figure 3). Rhythmicity through mobility (and mobility through rhythmicity) is embedded in performative practices, which can be seen as a glue holding together static and mobile as well as, material and immaterial elements of urban everydayness. Referring to the repetitive nature of these practices, Buhler (2020) introduces the concept of mobility habit/habitus. He describes individual habits as '*series of internalized or embodied schemas that compose specific (mobility) skills and know-how*' (Buhler, 2020, 216). Mobility habits should be understood as an interplay between the social and physical attributes of the urban environment and an individual's accumulated experience. Simply put, habits represent semi-stable patterns of individual mobility behaviour in recurring spatiotemporal situations. As Fitt (2018) points out, habitual mobilities are only partially conscious and reflective practices, often operating in non-discursive level. A substantial part of the urban rhythms is based on habitual movements and behaviours, which in their totality contribute to the reproduction of a distinct *mobility culture*. Mobility culture, also referred to as a constellation of mobilities (Adey et al., 2022), so strongly defined in many contemporary cities by car use, is a conceptual shorthand. It highlights the extent to which technologies of transport and movement are tied to the broader realities of everyday life through various mobility narratives, values, norms, symbols and emotions (Vannini, 2010; Mőgele, Rau 2020).

Urban mobility is not inherently nomadic; it also has an important sedentary component represented by places of rest, pause and stasis (Cidell, 2020). According to Jensen (2009), the dichotomy between the mobile and immobile is manifested through the existence of *enclaves* and *armatures*. Enclaves refer to urban locales characterized by low circulation speeds and a slower pace; places of encounter experienced as sites of stasis (homes, workplaces, schools). In contrast, armatures are understood as channels of mobility, structures enabling rapid flows of people or things, perceived and represented through motion (roads, pavements, fast foods). Everyday practices link urban mobility and immobility together into an interdependent and meaningful whole. The spatial distribution and internal rhythms of networked enclaves gives rise to specific beats and sequences of armature use (and vice versa). Examples include the nexus of localized activities of working people anchored by core home-work mobility, the home-centred movements of older adults, and the more complex chains of urban nomads, whether business travellers, elite managers or the homeless. Moreover, a growing number of urban practices can be described as *dwelling-in-motion* (Sheller and Urry, 2006) referring to the fact that boundaries between enclave and armature are blurred and a meaningful urban place no longer needs to be inherently spatially fixed (Jiron, 2010). The compartment of a moving train can serve as a temporary office, a passenger car can become a private resting place. Similarly, the meanings of individual, once clearly defined place-based enclaves are increasingly intertwined. Particularly in the context of ICT penetration into everyday practices, hybrid timespaces of work and home, domestic and public, are emerging (Graham, 1998; Green, 2002), with significant implications for the patterns of mobilities and rhythms (Thulin and Vilhemson, 2022).

2.4 Institutionalized Urban Rhythms

The city can be viewed as a type of institution in the broader sense of the term. According to Wallis (2003), an institution is a pattern of social activities and practices that is relatively stable over time and represents a certain social order of collective life. Social ordering is a dynamic process in which human and non-human subjects interact with other actors. Networks or sequences of these actions '*...generate their own space and own times, which will sometimes, and sometimes not,*

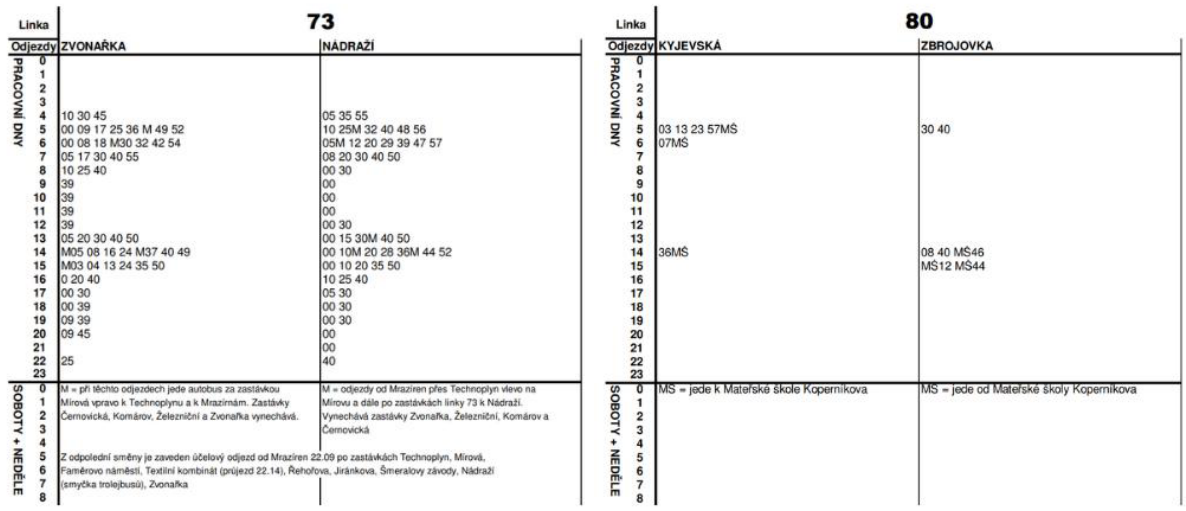
be coincident' (Amin and Graham, 1997, 420). Institutionalized patterns consist of recurring practices reproduced in stable places and times, collectively adopted and synchronized within a given societal milieu (Jenkins, 2014; Blue, 2019). Similarly, Jessop (2001) emphasizes temporality and spatiality as key components deeply inscribed in institutionalized social structures. He comes up with the concept of a *spatiotemporal fix* – a set of spatiotemporal horizons and boundaries that both enable and regulate individual strategies. Institutionalized rhythms not only ensure continuity, predictability and plannability; they also carry a semiotic system and symbolism (Harvey, 1996) while acting as a means of discipline and control (Jessop, 2001; Madanipour, 2017). Institutionalization is a certain formalization of the bond between specific places and specific times. Through this bond, an institution, social network, or other powerful societal actor monopolises the spatiotemporal coordinates of a particular practice (Van den Broek et al., 2002).

The sociotemporal order expressed in the form of institutionalized rhythms can be understood and represented in various forms. In a narrower sense, institutionalisation refers to official temporalities imposed on the individual through bureaucratic or political instruments of power (Crang, 2001; Burkitt, 2004). Virilio (1997, 13) speaks of '*...chronopolitical regulation of human societies*', and thus, like Adam (1995) or Urry (2000), expresses a tension between the spontaneity of individual life and the discipline stemming from collective synchronisation (also discussed in more detail in the chapter 3.2 Politics of Space and Time). However, in a broader sense, institutionalized rhythms should not be viewed solely as externally enforced times and spaces governing individual's everyday practices. Although grand temporal structures – such as working hours, school schedules, public holidays, and blue laws – are undeniably normative, another variant of institutionalization emerges at the level of the individual, household, or other spatiotemporal enclaves (Stavrides, 2013). These include habits and routines that are intersubjectively communicated and shared within family, work or leisure networks. Practices such as the daily family dinner, the morning dog walk or weekend shopping trip represent micro-institutionalized rhythms of *interaction time* (Lewis and Weigert, 1981), not strictly enforced, but rather sedimented through repetition and habitual embeddedness. These banal repetitive becomings operate within the officially imposed spatiotemporal horizons. As Edensor (2006) puts it, there is always an interplay between '*small everyday arrangements*' (ibid., 529) and overarching collective rhythms – involving adaptation, resistance and subversion (Chaplin, 2002).

From a macro-scale perspective, significant differences exist between the urban settlements of agricultural societies, whose institutionalized rhythms are closely aligned with ecological cycles, and modern industrial cities orchestrated by occupational order and seasonal consumption patterns (Mukerjee, 1990). By examining everyday life in more detail, we can identify distinct spatiotemporal signatures of institutionalized practices embedded in the sociotemporal order of a given historical epoch (Bovone, 1989; Líškovec et al., 2022). The solidification of social times within urban industrial modernity was shaped by a complex bundle of processes in the political, cultural, economic, and technological domains (Hassan, 2009). The shift in time reckoning, alongside the advent of mechanical clock time, paved the way for disciplining the modern city. While mechanical time cannot be understood as an institution per se, its widespread societal adoption gave rise to a new form of intersubjectivity, a collective temporal consciousness across social and professional strata. As Glennie and Thrift (2009, 235) observe '*...clock time is appropriately characterized as a web of practices linked to a particular metric, rather than purely a technological device*'. Meaningful stretches of time have taken on the abstract form of weeks, days, hours, minutes, and seconds representing the basic temporal grid into which practices are attached, synchronized, planned, and measured with precision (Mumford, 1934; Zerubavel, 1982; Harvey, 1990; Lash and Urry, 1994; Shove et al., 2012). Just as the development of transport infrastructure expanded the spatial limits of the growth of the industrial city, advancements in public and private lighting pushed the temporal boundaries of the everyday further into the night-

time. This, in turn, opened up opportunities for the institutionalization of nocturnal practices (Schivelbusch, 1995; Edensor, 2015).

The adoption of time as a measure for valuing work turns it into a commodity and, at the same time, makes working time a crucial component of the spatiotemporal organization of the modern industrial daily urban systems (Adam, 1990). The measured and controlled rhythms of work (and school) strictly demarcated the times of work and non-work practices, with the former being privileged over the latter in terms of adaptation and synchronization. The dominant industrial temporality is reproduced through the institutionalization of collective practices within the social group of industrial workers. Retail opening hours or transport timetables (see Figure 4) are part of a tangible and intangible spatiotemporal infrastructure closely linked to the specific industrial organisation of work (Mulíček et al., 2016; Besedovsky et al., 2019). By its temporal nature, industrial urban culture appears to be rather monochronic, focused on one particular activity at a specific time (Lindquist and Kaufman-Scarborough, 2007). This temporal regime is closely paired with industrial zoning policies, which synchronize time and space, making territories bounded within specific spatiotemporal coordinates. However, as van den Scott (2014) points out, this societal *monochrony* can disadvantage (both temporally and spatially) groups that fall outside prevailing collective routines, complicating their access to services and other social opportunities. Similarly, the prioritization of decontextualized *economic time* marginalizes forms of time not subject to commodification - family time, care time, and home time (Adam, 1995).



Linka 73

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	12	39	00 30
	13	05 20 30 40 50	00 15 30M 40 50
	14	M05 08 16 24 M37 40 49	00 10M 20 28 36M 44 52
	15	M03 04 13 24 35 50	00 10 20 35 50
	16	0 20 40	10 25 40
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Linka 80

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Figure 4: *Examples of timetables of two bus lines illustrating the monochronic spatiotemporal organisation of industrial Brno in 1989 – 21 of the 42 bus lines operated were temporally and spatially linked to the rhythm of local large industrial enterprises (Mulíček et al., 2016; BMHD, 2024)*

The gradual fading out of institutionalized industrialism is accompanied by the emergence of a polychronic society, which, according to some authors, is marked by the erosion of large collective rhythms (Shove, 2009; Gwiazdzinski, 2020). When viewed through the lens of rhythms, the post-industrial city seems to lose the clarity and predictability that characterized industrial everyday patterns. Temporal differentiation becomes more complex – days and weeks break down into '*blocks of time*' (Zerubavel, 1993, 9), whose boundaries are blurred, and which are hybrid – not necessarily linked to a single specific activity. This perceived spatiotemporal fragmentation can

be attributed to the destandardization of work and related schedules, as well as to broader processes of deindustrialization and globalization (Paolucci, 2001; Kamp et al., 2011), It is also driven by the breakdown of mass consumption patterns (Southerton, 2020) and the increasing pervasiveness of communication technologies that offer new models of everyday synchronisation (Graham, 2005). The experience of structured social time is transformed into the experience of *instantaneous time*, mediated by the ubiquitous presence of absent others in individual everyday practices (Urry, 2000). However, the notion of a complete dissolution of any unifying spatiotemporal order is questioned by Stavrides (2013, 37), who argues that:

> '*…rhythmicalities are now increasingly organized and separated into distinct urban settings, and defined as characteristic of those settings, rather than existing as part of an intense, machine-centred production of overarching urban rhythms…*'

In other words, institutionalized dominant rhythm is being replaced by a collective acceptance of polyrhythmia and simultaneity – a state in which multiple, overlapping temporalities coexist, embedded, codified, and regulated within specific bounded networks of places and mobile actors (Sheller and Urry, 2006).

3. Representing and Planning Urban Everydayness

3.1 Individual Geographies

The individual geographies of everydayness reflect the ways in which living in the world is perceived, represented and enacted. Routinized practices and movements are not so much the product of continuous reflexive analysis as they are rather a part of sedimented perceptions and conceptions of recurrent activity patterns that provides stable spatiotemporal ontologies (Freundschuh and Egenhofer, 1997; Mulíček et al., 2013). The meanings of spatiotemporal situations are shaped by an individual's embodied positionality – her or his subjectivities, feelings, memories and emotions (Kwan 2007). In this sense, Thrift (2000, 36) draws attention to a large set of actions and bodily practices that he calls non-cognitive:

> '*We can conceive of non-cognitive thought as a set of embodied dispositions... which have been biologically wired in or culturally sedimented, action-oriented 'representations' which simultaneously describe aspects of the world and prescribe possible actions.*'

Furthermore, no single spatiotemporality defines an individual; instead, everyday life involves shifting among multiple, coexisting geographies based on personal memories, representations, and pre-existing collective knowledge (Felski, 1999; Cadman, 2009; Azizi, 2011). Individual representation usually arises from incomplete or imprecise knowledge of insider (Duckham et al., 2001). By *'being inside'* we refer to a person's situated spatiotemporal imagination, which deeply connects not only with cognitive stereotypes and accumulated personal experience but also with localized trans-subjective meanings linked to particular places or objects (Simpson, 2017). It is *bounded rationality* (Simon, 1997; Rasouli and Timmermans, 2015) that shapes everyday decisions and practices – a rationality of experiential timespace, where concepts of distance, speed, pace, duration and sequencing are filled with lived and contextualized meanings (Ellegård, 1999).

Individual representations of the everyday timespaces contrast sharply with the objectified representations found in scientific, political, or planning frameworks (Dourish, 2006). According to Egenhofer and Mark (1995) the *naive geography* of daily life is marked by strong time-space coupling, where place is defined by time and vice versa. Similarly, Raper and Livingstone (2001) suggest that spatiotemporal relations significantly co-constitute the ontological identity of subjects, objects and places. For example, an urban park may serve as a populated recreational space by day but becomes a potentially unsafe, deserted space at night. Similarly, a congested road may hinder travel during weekday rush hours, yet on weekends, it can provide a convenient passage through the city. Thus, the individual representation of a place is closely tied to its *temporal identity*, seamlessly linking localized attributes to specific times or rhythms.

An individual's movement through space is heavily influenced by how their lived experience is spatialized and translated into a *cognitive map*. Typically, this map integrates topographical and topological geo-imaginaries to constitute an everyday timespace as a lived territory (Egenhofer and Mark, 1995). Topographical imagination organizes the locations of places and objects coexisting *in space*, while topological imagination refers to the sequences of places and objects in time that *are space* (Lash, 2012). Topological representations within everyday timespace are more often expressed and shared through narrative than graphical visualisation, reflecting its internal dynamics and the temporal order of events and encounters. Lindón (2019) introduces the concept of *urban scenarios* – spatiotemporal fragments that comprise the topology of the lived network. Each fragment predetermines the possibilities and constraints of the next network configuration within the continuum of everydayness. Thus, the present 'here and now' moment contains a finite set of possible 'then and there' configurations (Allen, 2011).

In the ordinariness of the daily routine, individuals navigate between topographical and topological imaginations as well as different metrics of time and space. Egenhofer and Mark's (1995, 11) assertion that '*...topology matters, metric refines...*' refers to fuzziness, multiplicity and predominantly qualitative nature of metrics embedded in everyday spatiotemporal patterns. These qualitative metrics rely on categorical judgments about attributes like size, duration, distance, direction, or speed – whether related to people, objects, or events. Parkes and Thrift (1975) point out that within these judgments, spatial metrics are combined into a logical whole with the temporal reasoning. Attributes and categories of space are often intuitively measured by time and, vice versa, the sequences and dynamics of time are spatialized – expressed in spatial terms and localized (Peuquet, 1994). However, it is not just a matter of linking time and space, as metrics of daily routines can also be constructed and communicated, for example, in the other intersecting contexts of financial costs, convenience, and personal safety. Thus, daily topographies result from a negotiation among various metrics, balancing time, physical, financial, and emotional costs (Mulíček and Stachoň, 2019).

Everyday topologies and metrics are not universally transferable; rather, they are fluid constructs reflecting both long-term experience and the momentary state of the individual, as well as the constraints and opportunities presented by the external circumstances. Studies of everyday life often stress the body's role in inhabiting time and space (Seamon, 2023). Embodied experience is always situated and shaped by the physical and socially constructed attributes of a body – such as gender, age, race, physical condition, and health (Moss and Dyck, 2003). As a foundational element of daily life, corporeality is now dramatically transformed by technologies that extend bodily capacities, enabling new ways of experiencing time and space. Without invoking romanticized ideas of man-machine coupling, we can speak, along with Haraway (2023) or Gandy (2005), of cyborgization. According to Gandy (2005, 29), cyborgization in geography entails the creation of hybrid spaces and times through '*...system of technological devices that enhances human productive and imaginative capabilities...*'. There is a growing number of diverse infrastructures that modify the spatiotemporal background of everyday life. Although they do not fundamentally alter biological nature of the individual, these technologies significantly affect subjectivity, cognitive capacity, and, importantly, personal experiential space (Thrift, 1996).

Communication, imagining and mobility technologies are probably the most pervasive in shaping everyday geographies as they contribute to hybridization of spaces and times. Here, hybridity refers to a combination of material and virtual, present and absent, localized and unanchored elements. Galloway (2004) describes these as mixed reality environments in which technologies open up entirely new possibilities for the individual to synchronize and synchronise, whether real or virtual, relationships, events and encounters, as well as to perform a range of activities simultaneously in parallel times while detached from specific spaces (Mitchell, 2003). Such hybrid networks can weaken collectiveness based on geographical proximity – in favor of communities formed within ICT networks (Crang et al., 2007). They also reshape the underlying metrics and experiences through which individuals represent and communicate the lived world. Caron and Caronia (2007, 4) observe:

> '*Even the simplest concepts that make up everyday knowledge, (...) can no longer be taken for granted. "Being present or absent," "being here" or "being there," and "being alone" or "with someone" are simply lexical labels that require a redefinition, invariably situated, of their meaning each time they arise.*'

Mobile and portable devices often combine precise spatiotemporal knowledge of an individual's location with ubiquitous computing power and always-on connectivity. Location-aware technologies and location-based social networks thus have the potential to transform micro-coordination practices by enabling real-time rescheduling, supported by advanced navigation in

real physical fabric. However, this technological sharing of individual spatiotemporal coordinates also raises concerns about geographically defined privacy and forms of surveillance in hybrid spaces (de Souza e Silva, 2013, 2023; Kitchin, 2023).

3.2 Politics of Space and Time

Time is often less emphasized in political discourse compared to space. Despite a strong current tendency to spatialize social relations and experiences, time – inseparably linked with space – remains a fundamental political issue (Massey, 2004; Sharma, 2014). Both are socially constructed relational categories, constantly negotiated, or authoritatively controlled, which allows us to view them as both contexts and core topics of various policies and politics. Here, it's important to distinguish between *the times and spaces of politics* on the one hand, and *the politics of time and space* on the other. While the former case refers to situating political activity within specific spatial and temporal contexts, in the latter case, time and space are both subjects and instruments of numerous planning schemes, measures, and regulations (Nguyen, 1992). The politics of time and space should not be confused with the institutionalization arising from repeated and accepted spatiotemporal routines. Rather, they involve projections of political or economic power aimed at establishing particular spatiotemporal regimes at different scales. Following Adam (2008) and Hassan (2009), we can refer to these regimes as specific timescapes. Timescapes, as combinations of timeframes, tempos, durations, and timings, incorporate historic and political time embedded into spatial and material contexts (Howlett and Goetz, 2014).

The political dimensions of space and time are captured not only in Doreen Massey's (Massey, 2004; Saldanha, 2013) well-known accounts of power-geometry, but also in other concepts outlined at different levels of abstraction. Sharma (2014) extends the idea of power-geometries through power-chronography approach, advocating for a more nuanced understanding of cultural, de-spatialized politics of time. With a partial focus on biopolitics, this concept examines how various institutions and power-actors '*compose a temporal order that normalizes people's experiences of time*' (ibid., 19). Numerous authors discuss various forms of *chronopolitics* within the fabric of everyday urban life, exploring phenomena such as the acceleration and fragmentation of urban social time (Virilio, 1997; Ladner, 2009), the need for synchronicity with dominant rhythms of various urban infrastructures (Kärrholm, 2009; Amman Y Alcocer and Gutiérrez, 2016; Wall and Knierbein, 2023), control over individual behaviours imposed by the state or institutions (Bhatia and Canning, 2021), and the temporal power inherent in digital technologies and technical systems (Kitchin, 2023). Importantly, none of these perspectives separates time from space; instead, they treat time and space as mutually interdependent. Time and space represent equivalent frameworks that forms meanings and structures of *polis*, i.e. a timespace held together by rules, habits, and traditions (Stevens, 2016; Osman and Mulíček, 2017).

As Lynch (1972, 74) observes, '*...temporal modifications will often have spatial consequences...*'. This statement succinctly captures the two-way link between planning space and planning time. The linkage can be documented in the complex and often unforeseen impacts of policies designed primarily to transform societal temporality. The 1968 shift to a five-day workweek in socialist Czechoslovakia extended the weekend and indirectly spurred a boom in second homes, a phenomenon that significantly influenced the structure of the settlement system for decades (Linhart and Vítečková, 1975). Similarly, the decision by the retail chain Tesco in 2005 to introduce 24-hour opening hours in major hypermarkets in the Czech Republic visibly altered the night-time geography of these cities, affecting the spatial distribution of night-time occupants in streets and public spaces (Mulíček and Osman, 2018). In another case, the major rescheduling of public transport connections in Brno in 1995 was a political and planning response to the post-

industrial transformation's impact on mobility patterns. This shift not only reorganized transport schedules but also rerouted them spatially (Mulíček and Seidenglanz, 2019). Changes in timing thus indirectly prompted spatial adjustments, such as the emergence of new transfer nodes and altered travel tactics among passengers, each with implications for the broader urban fabric.

Healey (2007) demonstrates the shifting interconnectedness of time and space in the context of planning policies. She argues that modernist planning was almost exclusively focused on the organization of space – emphasizing territorial proximity while neglecting time, viewing it merely as a linear stream connecting past and future. Laurian and Inch (2019) and Raco et al. (2018) criticize modernist planning's disregard for immediate, lived time, experienced here and now. According to them, time was often conceptualized as an open future to be colonized by planning proposals and measures. It is only since the late 1980s that the *real-time* began to resonate more strongly. The geography of proximity in planning discourse was replaced by a geography of relations, shifting the focus from spatial adjacency to accessibility. Post-modernist planning no longer understands the city or urban place as fixed slices of the Euclidean space situated within temporal container of a particular historical epoch. Instead, urban places are understood as products of the encounters between diverse individual spatiotemporal trajectories (Graham and Healey, 1999; Graham and Marvin, 2001). Davoudi (2012) refers to this shift as a revival of the interpretive planning tradition that defines place through spatial and temporal practices.

The growing importance of time in political and planning discourse largely reflects the increasing mobility of contemporary society. Policy focus has shifted from clearly localized immobile subjects to various mobile subjects across topics that include enabling, facilitating and accelerating movement; synchronizing individual mobilities; and enhancing the accessibility of places and functions (Henckel and Thomaier, 2016). In this context, time enters political-planning practice both as a metric for accessibility and a framework for socially beneficial synchronicity. However, as Smeds et al. (2020) point out, there is no universal mobile subject. Instead, transport, urban, and social policies often operate in a state of compromise between conflicting temporalities among different types of mobile actors. Planning tensions arise between the need for speed on the one hand and slowness on the other (Cresswell, 2010), between rhythms that define a territory's identity and those that destabilize it (Kärrholm, 2009), and between movement as a lived norm and stasis or waiting as its necessary counterpart (Singer et al., 2019).

In contemporary planning practice and decision-making, numerous examples illustrate explicit linkages between time and space within a single coherent action. These include Italian urban time policies and Territorial Timetable Plans, which aim '*...to accommodate temporary dwellers and residents with different mobility situations...*' (Mareggi, 2002, 177) and to ensure accessibility of urban services for different types of users across space and time (Belloni, 1998; Mückenberger, 2011; Boccia, 2013). Additionally, various *night-time policies* are inherently spatiotemporal, as they regulate emerging 24/7 city practices that permeate the temporal territory of the urban night. Pieroni (2015, 10) describes urban night as a public issue, highlighting conflicts between new and traditional nocturnal practices from infrastructural (Pawlusiński, 2023), economic (Schwanen et al., 2012; Mallet, 2014) or security (Crawford and Hutchinson, 2016) perspective. Finally, the concept of the X-minute city incorporates the temporal dimension of urban everyday life by establishing normative thresholds for optimal accessibility. The 10-, 15- or 20-minute limit is not just a temporal marker of maximum distance to amenities, but also an expression of an idealized scale for urban life – a scale embodying reasonable mobility, compact form and community-based neighbourhoods (Khavarian-Garmsir et al., 2023; Lu and Diab, 2023). These policies, along with others not discussed here in detail (such as the Cittaslow Movement), depict urban everyday life primarily as a timescape, illustrating a paradigmatic shift in urban governance toward a relational understanding of urban practices.

4. Researching Spatiotemporal Patterns: Methodical Issues

4.1 Time Geography

The integration of temporal aspects into the exploration of spatiality emerges from a variety of theoretical and methodological positions within the research practice of contemporary geography. Even when narrowing our focus to a particular segment of the everyday temporality, disregarding other temporal frameworks in geography such as historical-geographical approaches or time-series analysis, the conceptual diversity remains evident. Rather than attempting to 'freeze' and describe a spatial situation at a single point in time, these approaches conceptualize timespace as a largely indivisible, though internally variable, entity. As Burkitt (2010, 224) aptly notes:

> *'Within everyday life, some practices are fixed more in geographical space and relatively frozen in time, while other more fleeting experiences are quick to pass and do not have such a substantial materialization in geographical space.'*

One of the earliest systematic frameworks that treats time with the same level of significance as space is Hägerstrand's *time-geography* (Dodgshon, 2008). Hägerstrand did not view time geography as a theory per se, but rather as a way of thinking about society and the environment with its own language and notation system (Ellegård, 2023). Although semi-scientific time-budget studies have been carried out since the beginning of the 20th century (Thrift, 1977a), it was the Lund school of the 1970s that focused attention on the movement of individuals in both space and time. It views space and time as equally essential resources or as interlocking arenas, enabling individuals to organize various forms of interactions with others – be they individuals, actors or institutions – within their individual *projects*. An individual's presence within a timespace abstraction of the project is depicted as a path. The form, duration, and timing of each project or path are shaped by constraints, whether related to capability (the individual's skills, knowledge, and competencies), coupling (the necessity for physical connection with other individuals, objects, or information), or authority (access restrictions and limitations) ones (Hägerstrand, 1970; Thrift, 1977b; Sui, 2012).

Classical time-geography emphasizes the corporeality of human existence and movements (Shaw, 2012). However, it often represents this corporeality somewhat superficially within decontextualized three-dimensional chrono-chorological diagrams or prisms (Merriman, 2012; Sui, 2012). Mapping the path within mathematical coordinates of space and time provides only limited scope for recognizing the nuanced temporalities and spatialities of the individual. Moreover, time geography typically employs a mechanical time of clocks and calendars without accounting for alternate temporal perspectives and conceptualisations (Gren, 2001; Dodgshon, 2008). The strict emphasis on corporeality also somewhat limits the framework's applicability within environments heavily mediated by information and communication technologies. In that regard, the everyday role of coupling constraints is notably altered by the transition of many human practices from physical to virtual spaces (Couclelis, 2009).

Modern adaptations of time geography address some of these limitations while retaining the methodological clarity and analytical strength of *project* and *path* concepts. The foundational constructs of time geography are compatible with the methodologies not only of geographical sub-disciplines but also with those in transport and environmental sciences. Adams (1995) suggested transcending the chrono-chorological view that binds individuals as corporeal entities to specific places and times. By advancing the concept of *personal extensibility*, he offered a means of incorporating place-transcendent ICT usage into time-geographical frameworks. Cross-disciplinary adaptability has enabled, among other, successful implementation of the time-

geography framework within GIS environments (Miller, 2017). New computational and visualization capabilities enable extensive individual-level data collection (often utilizing location-aware technologies), robust analysis, and aggregate insights at group or population scales. Advanced computational power, enhanced visualization algorithms, the ability to analytically correlate individual paths with diverse geo-referenced contexts, or the use of qualitative GIS tools enhance time geography's capacity to interpret complex spatiotemporal patterns, including the logic of their timing and sequencing (Kwan, 2002, 2004; Ellegård, 2019).

4.2 Rhythmanalysis

Edensor (2010) posits that Hägerstrand's time geography is to some extent a precursor or a broader framework for contemporary rhythmanalysis. While the core ideas in time geography rely on the principles of time budgets embedded in the calendar time metrics, the rhythmanalysis approaches adopt a qualitatively different conceptualization of time. Numerous authors from various fields, not only geography and sociology, often link the concept of rhythmanalysis closely with Lefebvre's and Régulier's ideas on the role of rhythms and repetition in the spatiotemporal ordering of everyday life (Lefebvre, 2004; Lyon, 2019). Lefebvre borrowed the notion of rhythmanalysis from philosopher Pinheiro dos Santos, and the concept itself connects to the work of Nietzsche, choreographer Laban, and French philosophers such as Foucault and Deleuze (Brighenti and Kärrholm, 2018; Crespi and Manghani, 2020).

One can find a number of common issues between rhythmanalysis and time geography, such as attention to corporeal experience and an emphasis on the role of different types of rhythmizers/pacemakers in temporal orchestrating an individual's routine or a particular place (Parkes and Thrift, 1979). However, rhythmanalyses allow for a more nuanced depiction of varied social times (Dodgshon, 2008), as rhythm is inextricably intertwined with the logic of a particular repetitive practice. Repetition here transcends scale, encompassing daily beats, weekly routines as well as seasonal cycles (Edensor, 2010). Each practice establishes its own (spatio)temporality – a unique social time that cannot be fully captured by its mere temporal coordinates of beginning and end (Elden, 2004). The concept of rhythm does not abandon the use of mechanical time but rather sees it as just one of several possible temporal metrics. To reflect the full complexity of lived timespace, it also operationalises other parameters inherent to interconnected practices, such as tempo, repetition nature, sequencing, and timing. Drawing on Adam's (2008) temporal elements, rhythmanalysis asks not only when and for how long, but also how intensely, within what time frame, in what sequence, and synchronized with what.

Methodologically, rhythmanalysis is somewhat elusive, offering only loosely defined guidelines – it is '*...as much about listening as seeing...*' (Highmore, 2002, 174). In this vein, Chen (2017, 4) says that:

> '*Rhythmanalysis as a method operates within the realm of discussions which promote the invention of methods to capture and animate the liveliness of social life.*'

Compared to classical time geography, rhythmanalysis lacks unified terminology and a technically straightforward toolkit for visualization and interpretation. Rather than prescribing a rigid methodology, it provides a conceptual framework with a plethora of possible approaches, methodologies and technics that blend quantitative aspects of rhythm with qualitative insights (Lyon, 2019). Quantitative aspects include time markers in the sense of chronos (when, how long) and data on the magnitude of the rhythm (the counts of people, vehicles or other phenomena and their fluctuations over time). The qualitative aspects serve as interpretive models assigning rhythms to specific pacemakers, situating them within sequences of other rhythms, actors and

places, and providing an interpretative narrative akin to map visualization. In geographical research, rhythmanalysis often does not come from the perspective of the individual, but from the perspective of place. Here, the goal is to interpret the place-based polyrhythmicity, whether that place is a square, a shopping mall or a city (Crang, 2001; Kärrholm, 2009; Mulíček et al., 2015). Brighenti and Kärrholm (2018) talk about territorialisation, i.e. analysing the relationship between rhythm and the tangible reality of a specific place. Rhythms can either define a place's identity or destabilize its core function, linking a territory to other locations. Simultaneously, a place's unique characteristics influence the processes of (de)synchronization and transformation among different rhythm types.

4.3 Chronotopes

The conceptual instrument of *chronotope* is one of the possible tools for operationalizing the rhythmanalytical approach, which employs rhythm in order to combine time and space into a unified spatiotemporal analytical entity. While traces of chronotopic thinking can be identified in early 20th-century natural sciences (Lagovska and Oleinikova, 2023), within geographical discourse, the chronotope is primarily associated with Mikhail Bakhtin's work in literary studies. In Bakhtin's conceptualization, the chronotope represents a specific matrix of relations between space and time, with each literary genre configuring these relations in a different way (Bakhtin, 2003; Lawson, 2011). According to Folch-Serra (1990), chronotopic insight allows for typologies of situations within a novel or play, where the plot aligns with particular representations of time and place.

The chronotope concept offers two key features that make it particularly valuable in geography, ethnography, and environmental studies. First, it effectively makes time visible within the material context of everyday life. This '*representational importance of the chronotope*' (Folch-Serra, 1990, 263) arise from the emphasis put on narrative – placing events within a specific context of *kairos* and *topos*. The Greek term topos implies a meaningful place, just as kairos goes beyond abstract, mechanical time (chronos), extending into opportune, contextually rich moments. The chronotopic timespace is defined by a tangible materiality (topos) that creates suitable opportunities (kairos) for action, decision or event (Rämö, 1999). Thus, the methodological value of the chronotope lies not in merely mapping events across time (chronos) and space (choros), but in narrating them as integral parts of both time and space. From this perspective, it may be more accurate to understand the chronotope as a *kairotopos* (Rämö, 1999).

Second, the chronotopic approach enables us to view timespace as a dynamic entity shaped by '*...the constant dialogical interaction of a multiplicity of voices...*' (Holloway and Kneale, 2000, 82). Bakhtin (1981) refers to this as heteroglossia or polyphony, a plurality of meanings and relationships among utterances and actors. In social science research, heteroglossia signifies both the multiplicity of perspectives from which a given spatiotemporal situation can be viewed and the multitude of relations and rhythms that constitute this situation. In the context of rhythmanalysis, one could argue that spatiotemporal situation of place or landscape is rarely made up of only single rhythm, or a single type of encounter. Rather, polyrhythmia is a norm (Crang, 2001), compelling us to read and interpret the scene not as a monologic text, but as a multi-voiced formation (Lawson, 2011).

According to Remm and Kasemets (2020), the chronotope offers substantial analytical potential for geographical research. An illustrative example is its operationalisation within Italian time-policies. Mareggi (2002, 175) puts it as follows:

> '*Urban places within the city can then be interpreted in relation to their differing chronotopes. This refers both to the physical place and to the aggregation of the time patterns of the different populations who make use of that place.*'

This perspective, replicated in a number of studies (e.g. Mulíček et al., 2015; Lager et al., 2016; Paiva et al., 2017) and partly reflected in Seamon's concept of *place ballet* (Seamon, 2023), understands the chronotope as a tool for categorizing the spatiotemporal organization of urban places. Chronotopic mapping or analysis entails assigning distinct rhythmic patterns to specific places and codifying unique spatiotemporal configurations (Atmodiwirjo et al., 2019). This purely analytical perspective interprets a city or region as a collection of monologic, rhythmically explicit chronotopes of smaller scale, which through relational connections form a complex polyphonic/polyrhythmic chronotope of a larger whole (cf. the concept of *chronopolis*; Osman and Mulíček, 2017). While the typical rhythmic profile of a specific place can be often narrated only on the basis of direct observation alone, efforts to identify a kind of spatiotemporal regionalization within an urban system may require *chronographic cartography* to capture the distribution of pacemakers, time markers, or population groups with specific spatiotemporal habits (Stabilini et al., 2013).

4.4 Mapping and Storytelling

As for the interpretive use of the chronotope concept, Remm and Kasemets (2020) see it as somewhat underutilized, despite the close connection between interpretation and analysis. The fundamental premise of the chronotopic approach is that space is not privileged over time. A key methodological challenge, however, is to balance and seamlessly unify these two basic Kantian categories, which structure the representation of human experience and knowledge. Efforts to integrate space-time representation often come into conflict with the language of modern geography, wherein tools for measuring and representing space, such as maps, schemes, and mathematical abstractions (Travis, 2014), are frequently used to represent temporal dimensions as well. This can lead to the spatialization of time (Raper and Livingstone, 2001), potentially obscuring meanings inscribed more in time than in space. Folch-Serra (1990, 258) observes that the meanings of a spatiotemporal situation become '*...not only 'graphically visible' in space but also 'narratively visible' in time...*'. Methodologically, a full-fledged chronotopic interpretation also involves the temporalisation of space (Crang, 2001), embracing narration/storytelling as an equally valuable tool for representing the spatiotemporal reality. If chronotopes can be understood as entities in which space is given meaning through time and vice versa, then different narratives can weave them into a meaningful spatiotemporal nexus of a day, season or life (Líškovec et al., 2022).

Looking at the first three texts in the set of articles presented in these habilitation theses (Sýkora and Mulíček, 2009; Sýkora and Mulíček, 2017; Mulíček and Malý, 2019), we see a clear interpretive emphasis placed on the spatiality of the processes and phenomena under investigation. The analytical chapters of all three articles address commuting; however, they only interpret spatial aspects of commuting relationships and patterns, overlooking their temporal dimensions – timing, cyclicality, and duration. This approach reduces the dynamic timespace of regular commuting to a static image – a frozen table-top view from nowhere (Specht and Feigenbaum, 2018; Mulíček et al., 2013) that locks the relationships between actors in time. Such mode of representation relies on static, totalizing perspective which may not fully reflect lived experience.

Instead, its purpose is to establish a basic *spatial form* (Ryan et al., 2016,) into which more dynamic spatiotemporal situations and scenarios may eventually be integrated. Narrative as a tool of representation becomes relevant only when the research scope broadens to include elements of time and temporalities, rhythms and chronotopic mapping.

There is a distinction between geographic research on various individual or collective narratives and stories, and the narratives geographers produce themselves to represent non-static spatiotemporal situations. In the latter sense, Atmodiwirjo et al. (2019, 227) or Bulkens et al. (2015, 2311) recognize narration as an apt method for capturing the spatiotemporal complexity of everydayness as practised and performed on daily basis. Likewise, Kwan and Ding (2008, 449) highlight narrative's capability to represent chronological sequences of events. Narrative used in geographical research assumes a certain hybrid nature:

> '*Narrative (...) is the combination of story with narrative discourse (...) shaped by temporality. (...) as a combination of story and discourse, narrative transcends mere description in the same way that place transcends mere location, by shaping it with meaning.*' (Pearce, 2008, 20–21)

Narrative transforms the original static spatial form into what is termed *story space* (Ryan, 2016, 24) – a more or less topological network where various objects and actors relevant to the overarching story are linked by interdependent relationships not only across space but also across time.

It is important to recognize that storytelling as a tool of representation is not exclusive to qualitative research approaches (Kwan and Ding, 2008); nor must stories be constructed solely in textual or oral form – as evidenced by the increasing popularity of story map tools combining textual and visual narrative (Caquard and Cartwright, 2014). The papers on urban temporality in these theses (see Osman and Mulíček, 2017; Mulíček and Osman, 2018; Líškovec et al., 2022) are illustrative examples where the analytical depiction of dynamic reality through often heterogeneous numerical datasets is interpreted in the condensed form of micro-stories. Here, the prefix 'micro' emphasizes the stories' synthesizing yet partial nature (Roth, 2021). Only the practices and rhythms present in a given time and place are highlighted. They involve a select ensemble of present or absent rhythmizers whose spatiotemporal interactions form the story's plot – the semantic core of a chronotope built on diverse analytical inputs.

4.5 Data in/for Mobile Society

The preceding chapters, focused primarily on the methodological aspects of researching everyday spatiotemporal situations, should be seen within a broader ongoing debate regarding the evolving methodological landscape in contemporary social science. A particularly relevant aspect of this discussion is the question of mobility as a phenomenon that not only structures lived social reality but also imposes new demands on research frameworks, tools, and data. Drawing on Simmel's ideas and methodological approaches from the Chicago School, it is in particularly the *new mobility paradigm* that calls for attention to a diverse array of mobile methodologies, challenging traditional, sedentary research perspectives (Sheller and Urry, 2006; Büscher et al., 2011). Merriman (2012, 14) discusses several methodological frameworks designed to account for '*the more-or-less mundane practices and materialities which comprise mobility systems…*'. He mentions various forms of mobile ethnographies, including numerous options of go-along-research, as well as technologically mediated methodologies of advanced time-space diaries, cyber-research and location-aware systems.

A defining characteristic of post-sedentarist 'doing research' is, among other things, a degree of scepticism towards big, centrally constructed data (e.g., censuses, annual statistical surveys, etc.).

This scepticism may stem from their structuring and aggregation into ontological categories, that, in some cases, result in chaotic conceptualization (Sayer, 2010). For example, the categorization of commuting into work and school travel or the distinction between permanent and usually resident populations are classifications that often fail to capture the complex identities of lived and researched everyday phenomena, leaving little room for contextual scaling and reflecting hybrid and transformative situations. More broadly, the dynamic nature of the contemporary urban environments exposes limitations of what can be termed ontological–representational data, i.e. data abstractly describing phenomena, things or persons independently of context (Offenhuber, 2020; Lauriault, 2018). In contrast, relationally constructed data are increasingly employed in rhythm and mobility research. These data types are not intended to universally represent particular aspects of reality; instead, many serve as proxy-data (Sulis et al., 2018; Offenhuber, 2018), illuminating relationships between the entities indirectly and adapting to '*the situation, location, and people involved*' (Offenhuber, 2020, 7).

A growing number of authors highlight the wealth of data available on the daily mobility of people and objects and the potential to extract geographically meaningful insights from these sources. Miller (2010, 181–182), for example, describes a 'data avalanche' - a metaphorical term for '*an unprecedented amount of fine-grained data on cities, transportation, economies, and societies, much of these data referenced in geo-space and time*'. Similarly, Kitchin (2022) discusses the expansive range of urban data. He employs the buzzword *big data* to describe a category of data assets (and associated methodological toolboxes) that are characterized by their large volume, continuous and fast production, fine spatiotemporal resolution, and real-time coverage of large population segments. Much of the big data used today to study the spatiotemporal dynamics of society can be conceptualized as proxy data – the by-products of the functioning of various types of technological infrastructures. Examples include social media activities, mobile networks traffic, shared-bike rides, or point-of-sale transactions, which collectively generate a large volume of digital traces enabling both the spatiotemporal characterization of places and the mapping of topological networks of individual everydayness (Miller, 2010; Novák and Temelová, 2012).

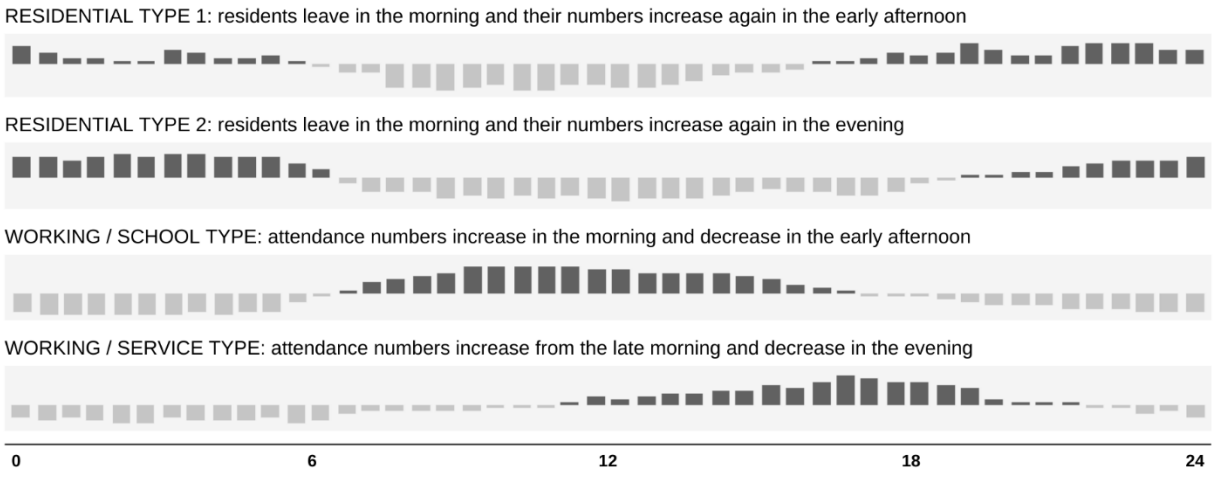

Figure 5: *Selected types of chronotopic profiles of settlement units in Brno defined on the basis of analysis of the number of people present according to data from the mobile operator network (Mulíček and Lískovec, 2022)*

Despite the many advantages and current appeal of big data usage, some caution is in order, as their proliferation could lead to a resurgence of data-driven science and even a kind of return to positivist epistemology (Graham and Shelton, 2013). While this shift is not inherently negative, it

does invite deeper consideration of the ways technological infrastructures are embedded in daily use and the positionality of the data they generate. In the context of mobilities, Lucas (2020) underscores the importance of mixed methodologies that allow not only to track '*mappable and calculable movement*' but also integrate individualized perceptions and interpretations attached to these movements. Similarly, criticism from feminist geography and critical cartography caution against the over-dominance of the numerical representation of world, which often permeates urban decision-making and planning through various *smart* concepts and policies (Ferreira and Vale, 2022).

5. Urban Everydayness: A Research Outlook

5.1 Investigating Futures of Everyday Life

The chapter *Urban Everydayness: A Research Outlook* is intended to be an open-ended conclusion with a dual purpose. First, it wraps up Part 1, which frames and contextualises the collection of articles published in peer-reviewed journals. Second, it aims to move beyond these articles by outlining the themes, trends, and perspectives that are beginning to shape geographical research on everyday life in urban environments and are likely to do so with increasing significance in the near future. However, in attempting to delineate areas relevant for future geographical research, several challenging questions arise about the background, sources, and specific validity of any forecast. Even if urban everyday life is narrowed down through a socio-geographical lens – focusing on spaces and times woven together by various practices into stabilized networks of rhythms, circulations and encounters – it is not entirely clear what types of developmental processes should be prioritized for investigation to effectively estimate future trajectories.

Visions of the future city are often formulated within the discourse of planners, social theorist or architects as normative projections that sometimes contain utopian elements. This view, while perfectly legitimate in political-planning perspective, tends to reflect developments in isolated technological, economic, social or environmental domains and represent them as grand narratives. What is frequently overlooked, however, is insight into the ways and forms in which these broad transformative forces are '*adopted and shaped within the fine-grained practices of everyday urban life*' (Graham, 2004, 17). It should be clear that these are not the transformative forces themselves, be they technological systems, policies or external perceived risks such as migration or climate crises, that are of research interest. Instead, the focus is on how these forces interact with the concrete spaces and times of urban routines, their embeddedness within material and cultural practices, and their capacity to produce spacings and timings that foster new *productive banality* (Amin and Thrift, 2002, 98). The goal of forward-looking social science research on everyday urban life is thus to capture the diverse realm of individual adaptations, adjustments and materialisations.

According to Adey et al. (2022) or Greenfield (2017), technological systems and regimes play a significant role in models that explain drivers of social transition, particularly those emphasizing shifts in society's spatiotemporal and mobility behaviours. A bibliometric review of urban planning publications by Sharifi et al. (2023) reveals that, since the mid-1990s, technological innovation topics have consistently been at the forefront of research interest. These topics, however, are usually disembedded from the purely technological/technical domain and grounded in the context of the everyday through interaction with processes such as demographic ageing or shifts in political paradigms (as discussed in the chapter 5.2 Technologies and Remediation of Everydayness). Furthermore, the abundance of research examining the transformation of spatiotemporal patterns during the COVID-19 pandemic underscores the significant role of disruptive events in accelerating transformations of everyday life. This raises questions about the foundation of future-oriented research on everyday life transformations: To what extent does it rely on extrapolating evolutionary trends? How much weight should be given to major structural shifts? And what is the resilience of everyday life networks to such disruptions?

5.2 Technologies and Remediation of Everydayness

Retrospectively, Amin and Thrift (2002) identify two major waves of broadly defined *inventions* that have reshaped the spatiotemporal organization, perception and representation of urban quotidian. These inventions have also emerged as symbolic artifacts that co-define the focus of

geographical and sociological research. According to the authors, the first wave of modern urban everyday life, emerging during the 17th and 18th centuries, was shaped mainly by time-measuring devices that introduced new standards of precision and duration of routine practices. It was also marked by the development of the postal system and the first mass media (newspapers), which enabled the rapid circulation and mediation of information across space and time. The second wave, associated with the late 19th and early 20th centuries, was driven by the rapid evolution of transport and communication technologies. These innovations, along with new methods of capturing and storing information, enabled participation in multiple activities often significantly disconnected in space or time. The spatiotemporal reconfiguration of daily routines was further supported by the development of a range of urban infrastructures (such as electricity or gas systems), and represented through media like photography, radio, and later television broadcasting. The pressing question is whether we can now sketch the contours of potential third wave of *inventions* with a similarly transformative impact. Amin and Thrift (2002) speculate on the role of various types of information technologies, often labelled as digital (Keating, 2024) or new media (Graham, 2004). Crang et al. (2007) see these technologies as key contemporary drivers of the *remediation of everyday life*. By remediation, they refer to the mingling and fusion of the digital realm with the materiality and rhythmicity of 'old' technologies which still constitute the infrastructure of the existing everydayness. We can identify several strands of such remediation that are particularly relevant for future socio-geographical research.

Much attention has been devoted to the remediation of mobility practices. Rather than focusing on the technological improvement of transport modes (e.g., electric cars or micro-mobility devices), current research emphasizes the subtler topic of coordinating and synchronizing individual mobilities through digital communication technologies. In particular, linking the automobile with mobile communication capabilities has introduced greater flexibility to spatiotemporal routines, enabling nuanced real-time coordination and personalisation of daily schedules (Jain, 2006; Hjorthol, 2008; Peters et al., 2010). Efficient coordination tools are also studied as an essential component of innovative organisational forms of transport systems, such as sharing platforms (cars, bikes, etc.) or services rooted in the Mobility-as-a-Service concept (Vitrano and Colleoni, 2020; Hensher et al., 2021). This marks a shift in research focus – from mobility *by technologies* to mobility *with technologies* (Hafermalz et al., 2020). Ubiquitous personal digital technologies facilitate various forms of co-presence, control, and access to remote resources, imbuing mere movement in space with additional meanings, purposes and possibilities. Mobility research is thus being extended to explore the potential of remote tracking and sharing of movement – e.g. via sports and parenting apps – and their implications for the spatiotemporal anchoring of a route, safety and emotional perceptions. Furthermore, ways of using travel time for different types of '*transitional activities*' (Bisell, 2018, 59) – productive or non-productive – represent another promising area of inquiry (Hughes and Mee, 2021; Mulíček and Stachoň, 2019; Dal Fiore et al., 2014).

Another prospective research area concerns the issue of ongoing digitally supported hybridization of places and times (De Souza e Silva, 2023). Especially since the Covid-19 pandemic, significant focus has been placed on the merging of work and home places and times. Tele-working and tele-commuting practices have redrawn the boundaries of these previously distinct spatiotemporal anchors of urban everyday life, introducing new rhythmicities and exposing home to external pacemakers (Papakonstantinou-Brati, 2024; Thulin and Vilhelmson, 2021). Research on regular daily labour mobility and its application to different types of regionalisation tasks must increasingly account for these transformed relationships within the residence-work continuum. However, the research potential lies not only in redefining the blurred boundaries of domestic and work timespace. Domains such as consumption, education, and leisure also exhibit transitions, where formerly localized and embodied practices are now

mediated through mobile communication and the internet. For instance, the shift of shopping activities to the online environment exemplifies the blending of traditional retail (brick-and-mortar stores, physical shopping) with new technologies of shopping and consumption. This evolution introduces new infrastructures, social practices and places to the patterns of ordinary life, such as 24/7 online shopping, delivery services and pick-up boxes (Berg and Henriksson, 2020; Kulke and Baur, 2022). In this context, we can expect new themes to emerge in research on everyday personal micro-logistics and on-demand urban platforms (Crang et al., 2007; Richardson, 2020; Zheng and Wu, 2022).

Another major technology-driven research theme is the concept of the *smart cities*. The concept can be understood as a set of imaginaries and practices of future city that include technologically mediated practices played out in different social and political contexts (Kandt and Batty, 2021; Cugurullo and Acheampong, 2020). Here, the term 'smart' describes the integration of advanced urban analytics and big data sources into traditional domains of urban planning, design, and governance. An important research challenge is understanding how increasing amounts of *real-time data* inscribe through different types of applications and technological measures (e.g. intelligent traffic and parking management systems, dynamic door-to-door navigations, smart energy grids etc.) into the routine behaviour of urban actors as well as, in the longer term, into planning and decision-making procedures. Particular attention is given to planning and management of short- and medium-term fluctuations in the urban environment such as traffic congestion, daily or seasonal population distribution changes, and shifts in traffic demand – tasks often difficult to address with conventional analytical inputs (Kandt and Batty, 2021; Kitchin, 2019). However, the socio-geographical research perspective on smart cities is necessarily critical as well. It points to the selective targeting of smart ICT-based policies and the risk of exacerbating the so-called *digital divide* within the urban environment. The methods of data collection for smart solutions are also scrutinized, particularly for their reliance on extensive tracking and surveillance of real-person daily routines (Kummitha and Crutzen, 2017; Chib et al., 2022). In response, research has focused on enhancing inclusiveness in technological solutions and developing advanced spatiotemporal data modelling methods that respect urban life's privacy (Makkonen and Inkinen, 2024; Lee et al., 2020).

5.3 Disruptions and Resilience of Urban Life

The Covid-19 pandemic had profound effects on the spatiotemporal organization of everyday life across numerous countries. Quarantine measures, movement restrictions, and social distancing have spurred significant research interest in disruptions of established spatiotemporal routines and networks (Sharifi et al., 2023). Themes of urban vulnerability and resilience have emerged prominently in a number of scholarly reflections on the pandemic. Resilience, broadly understood as the capacity to cope with stress and adapt to threats (Coaffee et al., 2009), becomes a promising framework for advancing urban research (Büyüközkan et al., 2022). However, pandemics are just one of many types of disruptions that can push the rhythms of urban everyday life into a state of arrhythmia. Whether it is relatively gradual chronic stress such as global warming or demographic aging, or an acute shock such as pandemics of disease, terrorism, war or floods, from the perspective of socio-geographical research, disruption becomes research relevant only when '*…it unleashes other economic and political forces that can engender urban decline*' (Glaeser, 2022, 5). It is these economic, political or technological forces that are central to socio-geographical inquiry, as they often represent the forms of adaptation and mechanisms that ensure the functioning of daily routines.

Many adaptation mechanisms to disruptions are inherently technological in nature, framing urban resilience as a socio-technical or infrastructural phenomenon (Coaffee et al., 2009; Zhang and Wang, 2023). Indeed, the critical role of information and communication technologies (ICTs) in enabling distancing through telecommuting during the Covid-19 pandemic underscores this perspective, as do historical examples, such as technical measures implemented during the 1970s oil crisis or contemporary efforts to mitigate the regional impacts of climate change. This reopens the topic of the technological remediation of everyday life in two possible research lines. The first is research on technological remediation as response to a particular disturbance. Technology is seen as a vital agent in transforming networks of everyday practices to preserve their functionality, though not necessarily their original form, ensuring their robustness and adaptability in the face of disturbances. The second research focus is on the resilience of everyday socio-technical systems whose functioning is based on the integration of different technologies. Technologies and related infrastructures are considered a vulnerability factor in the functioning of cities, as many of them have become an integral part of routine practices. The extent of this interdependence is often hidden and becomes apparent only during disruptions as when established spatiotemporal patterns collapse (Amadi-Echendu and Thopil, 2020; Kawlra and Sakamoto, 2023).

While technological perspectives on resilience are compelling, the essence of urban resilience lies primarily in social and political domains. In this regard, the topics of social capital, the demographic structure of the urban population, the institutional quality, lifestyle or community competences are often discussed (Ribeiro and Gonçalves, 2019; Adger, 2000). The spatial and temporal dimensions of social resilience are perhaps most accentuated through what Champlin et al. (2023) describe as pandemic geography. This can be understood broader as a *geography of disruption*, mapping the effects of stresses or shocks on the spatiotemporal organization of urban society. This encompasses analyses of the effects of mobility constraints and the associated forced enclosures of routine practices within limited spatial and temporal scales as well as an analysis of the transformations of spatial and non-spatial relational networks. Planning and policy decisions aimed at reducing urban vulnerability often focus on ensuring access to fundamental urban services, functions and amenities. These measures include both preventive planning under normative resilience frameworks and ad hoc decisions flexibly tailored to critical situations. A typical example of this perspective is, for instance, the testing of the 15-minute city concept and its redefinition – evolving from an urban utopia to a practical tool for fostering a more resilient and robust urban system (Datola, 2023; Champlin et al. 2023; Mouratidis, 2024). In addition, research on social vulnerability and resilience helps to reveal how different measures impact various groups of urban actors, providing insights for developing differentiated and more inclusive urban policies (Meerow and Newell, 2019).

PART 2

6. Overview of Selected Papers

6.1 Structure of Research Areas

The collection of selected publications comprises eleven peer-reviewed papers, reflecting three interconnected areas of research. The first group of three papers focuses on the relational spaces and spatial configurations shaped by regular everyday job commuting. These studies primarily employ quantitative analyses of recurrent home-work relations to uncover the relational nature of commonly used geographical categories, such as urban centres, micro-regions, and metropolitan areas. The geographical scope of the inquiry ranges from regional to national scales, with a particular emphasis on the spatial dimension of relational patterns. The second block, comprising five research papers, shifts attention to discussing the role of time in shaping everyday urban activity patterns. Here, the urban reality is conceptualized as a spatiotemporal complex that can be analysed through the lens of the various forms of rhythms. The analytical use of rhythms enables the association of various cyclical urban processes (e.g., transportation, commuting, and retailing) not only with specific places but also with specific times, providing a deeper understanding of their actors, internal logics and spatiotemporal interrelations. Methodologically, these studies combine quantitative and qualitative approaches, leveraging diverse data sources across multiple scale levels. The final set of three papers presented in Part 2, based on qualitative methodologies, centres on spatiotemporal representation at both individual and institutional levels. The rationale for including this research issue in the thesis is to highlight situatedness of everyday life. It can be observed that both large-scale planning narratives and individual discursive practices give rise to the formation of their own relational geographies. These often diverge from analytically derived spatiotemporal patterns, reflecting the experiential nuances of timespace. Together, the eleven papers are unified by their exploration of urban relational spaces or timespaces – produced, materialized, and represented within the realm of everyday practice.

6.1 Relational Networks of Urban Systems

The first three research papers explore broader spatial structures shaped by the repeated daily movements of the working population between home and work. Commuting flows are employed here as proxies for repeatedly negotiated relationships, transcribed into the geographical space as abstracted daily urban systems, whether monocentric or polycentric. These papers challenge traditional views of urban hierarchies, advocating for a nuanced understanding of urban system dynamics that prioritizes functional connectivity over size alone. The focus is on urban centres as key anchor points within commuting spatiotemporal structures. Attributes such as population size, job concentration, and relative position within commuting patterns are used to define spatial frameworks of urban regions where diverse activities of daily life unfold. The identified daily urban systems represents fundamental spatiotemporal units, self-contained in terms of routine daily movements and practices.

The unifying methodological feature of these studies is the employment of a robust functional-spatial analytical framework. While quantitative analyses of commuting flows and advanced techniques of functional (relational) regionalization are central, they serve as tools to provide empirical insights rather than as ends in themselves. They produce an empirical background for a closer exploration of selected theoretical concepts touching on relational spaces at the micro-regional and regional scale. The concept of polycentric urban development and the borrowed-size

concept are critically examined in diverse spatial contexts, ranging from small and medium-sized towns (SMSTs) to larger urban systems. The debate over polycentricity and agglomeration effects intersects with broader research on socio-spatial cohesion and economic resilience, advocating for strategies that reflect the diversity of regional realities.

By emphasizing the importance of functional networks over mere geographical proximity, these papers call for a re-evaluation of urban hierarchies. The research findings do not dispute traditional models positioning large cities as primary drivers of economic growth but instead highlight the potential of alternative urban configurations and the shifts in settlement patterns that shape the spatiality of everyday life. With their focus on quantitative methodology and inductive regionalisation techniques, the studies continue the long-standing tradition of urban system analysis held in Czech context, particularly the works of Martin Hampl (Hampl et al., 1987; Hampl and Müller., 1996; Hampl, 2005) and the research of the Geographical Institute of the Czechoslovak Academy of Sciences (Maryáš and Řehák, 1987). The discussions resonate with current, more technically oriented research by geographers at the Palacký University in Olomouc (Klapka and Halás, 2016; Halás et al., 2019).

The paper '*The micro-regional nature of functional urban areas (FUAs): lessons from the analysis of the Czech urban and regional system*' is the earliest publication included in this thesis. It explores the concept of Functional Urban Areas (FUAs) within the Czech Republic, challenging the findings of the ESPON 1.1.1 report on European territorial development. The central argument is that FUAs must be understood and delineated at a micro-regional level, reflecting daily life patterns and socio-economic interactions. A comprehensive understanding of European territorial development, therefore, requires integration across all scalar levels of socio-economic life, including the microscale level. The paper advocates for policies that extend beyond large urban centres to also recognize the importance of smaller, functional urban regions, which play a crucial role in the socio-economic fabric of the region. Contemporary studies often focus disproportionately on larger, more visible urban nodes, overlooking the smaller yet equally critical urban areas that shape the everyday socio-economic landscape.

The empirical part is based on a detailed scrutiny of the Czech urban system, focusing on commuting patterns and the spatial distribution of jobs. Using 1991 and 2001 population census data, the study applies various criteria to delineate FUAs as urbanized, highly interlinked core areas. Additionally, it introduces the concept of Complex Micro-Regions (CMRs), a more holistic framework that includes peripheral areas maintaining functional connections to the cores. The comparison between 1991 and 2001 reveals a clear trend of job and service concentration in major urban centres, with smaller micro-regions losing autonomy and becoming integrated into larger FUAs/CMRs. These findings highlight processes of selective territorial development, emphasizing the need for more precise planning insight to address diverse spatialities of everyday life within different urban system configurations.

The relational approach was further developed in the paper '*Territorial Arrangements of Small and Medium-sized Towns from a Functional-spatial Perspective*'. This research focuses on small and medium-sized towns (SMSTs) and their roles within urban and regional systems. Using a functional-spatial perspective, the study analyses the territorial arrangements of SMSTs in various European regions. Its primary aim is to understand how these towns integrate into larger urban networks, whether they function autonomously, or if they are agglomerated with larger cities. Conducted as part of the ESPON TOWN project (Servillo et al. 2014), the study develops and tests a methodology to identify towns and their positionality within urban systems. This methodology is applied to regions in Catalonia, Czech Republic, Central France, and Slovenia, and includes three key steps: (i) identifying job centres based on employment concentration and commuting attraction, (ii) delineating functional micro-regions using the strongest commuting flows, and (iii)

developing a functional typology of urban centres that reflects their positionality within the urban system.

The rationale of the paper, however, extends beyond the mere functional analytics of the urban system. The aim is to discuss the relationship between relational settlement configurations and the territorial economic cohesion. The study examines how the positioning of towns and cities within urban networks affects their development, particularly concerning population growth, job creation, and economic resilience. Findings reveal that smaller urban centres in networked arrangements tend to perform better economically than those functioning autonomously or agglomerated with larger cities. Networked towns benefit from enhanced connections to other towns and cities, accessing a broader range of economic opportunities and services. In contrast, autonomous towns often face isolation, while agglomerated towns may encounter stiff competition from nearby larger cities. The paper concludes by suggesting that policymakers should consider the benefits of fostering polycentric urban regions and improving connectivity between towns to achieve balanced regional development. Additionally, it emphasizes the need for tailored strategies that account for regional differences in urban structures and the distinct roles played by SMSTs within these systems.

The third and final entry in this section is the paper '*Moving towards more cohesive and polycentric spatial patterns? Evidence from the Czech Republic*'. This study contributes to the broader debate on territorial cohesion and polycentricity by critically examining the universal validity of these concepts in diverse socio-economic and historical contexts, particularly in post-socialist countries undergoing significant transformation. The authors explore the evolution of urban system relational configurations in the Czech Republic from 1991 to 2011, using work-commuting flows as a key proxy for spatial practices. The primary research question investigates whether changes in the Czech urban system align with the normative ideals of polycentric organization and territorial cohesion or, conversely, reflect a shift toward a more polarized spatial structure. In this paper, polarization and polycentricity are presented as contrasting models of spatial organization. Polarization refers to the concentration of resources, population, and economic activities in a few dominant centres, often exacerbating regional disparities. Polycentricity, in contrast, promotes a distributed model where multiple interconnected centres share economic and social functions, fostering regional balance and reducing inequalities. The position of the Czech urban system between the polarized and polycentric state is closely tied to the scale and spatiotemporal organisation of everyday life, as well as broader resilience factors in economic, infrastructural, and mobility terms.

The study employs a detailed analysis of census data on work-commuting flows between municipalities for the years 1991, 2001, and 2011. The authors employ the novel concept of significant commuting flows to examine the changes in the number of commuting centres, which represent anchor points for numerous everyday practices. The findings reveal a significant decrease in the number of urban centres in the Czech Republic, with approximately 60% of centres identified in 1991 losing their centrality by 2011. The trend suggests a shift toward a more polarized urban system, diverging from the aspirations of polycentric spatial development policies. This evolution can be partly attributed to symptomatic processes of post-socialist transformation, such as deindustrialization and suburbanization, as well as the increase in the spatial mobility of the population. The main findings raise important questions about the predictability and effectiveness of large-scale normative planning concepts when applied to the realities of daily-life routines.

6.2 Interlinking the Spaces and Times of the Urban Everydayness

The second thematic block includes five articles connected by the shared theme of the spatiotemporality of everyday urban life. The research reflects a strong emphasis on urban geography, exploring the dynamic interplay of time and space in urban settings. Everydayness is conceptualized here as a cyclical phenomenon, where temporal recurrent changes – daily, monthly, or yearly – become inscribed into the material and institutional structures of the city through repetition. Compared to the articles in the previous section, there is a clear shift in scale of the research – from regional or micro-regional systems to the level of the city and metropolitan region. All the studies focus on the city of Brno. The reason for this is not an idiographic description of a single urban environment but the intention to demonstrate the analytical approaches and the use of often less conventional data sources for capturing the spatiotemporal organisation of urban everyday life. In other words, Brno is used here as a laboratory in which various types of relations between spatiality and temporality of the city are modelled and analysed.

Methodologically, the research adopts a variety of contextualized chronotopic approaches, primarily employing the analytical tools of rhythmanalysis. The results of the analyses can thus be read as a temporal regionalization, assigning typical rhythmic profiles to individual urban sites and distinguishing them by their temporal signatures. From this perspective, the research papers clarify how different parts of the city operate in different temporal modes depending on their function. For instance, shopping districts are characterized by short, fast-paced rhythms during the day, whereas residential areas display longer, more stable rhythms tied to daily commuting cycles. Conversely, starting from a temporal perspective allows for linking specific times, periods or moments to typical places – adding a spatial context to the temporal structure of the urban everydayness. In the presented explorations of spatiotemporal entities, whether it is the city as a whole or partial urban districts, these perspectives are combined. The studies seek to integrate the knowledge of temporal differentiation of the urban landscape with insights on the spatial differentiation of urban timescape. City is conceptualized here as a polyrhythmic environment where global, city-wide, and local rhythms intersect. This creates complex spatiotemporal networks where activities are synchronized (or desynchronized) across different urban places and locales.

The theoretical and methodological framework is applied to various dimensions of urban life, including retail and shopping, public transportation, and residential life. A significant aspect of this research involves identifying and constructing innovative temporal datasets to represent the rhythms and spectral profiles of different chronotopic types. Most of the data sources used, such as timetables or Google Popular Times data, function as proxy data, allowing the temporality of the city to be tracked through modelling and inferring, rather than through precise and complete time mapping. This critical examination of data sources represents a less visible but essential contribution of this body of work. Finally, the insights and methodologies derived from this research have practical applications. For example, the know-how developed through rhythmanalytical approach informed the creation of the '*Methodology of chronotopic typologization*' (Mulíček and Lískovec, 2022), a tool designed for use in urban planning practice.

The paper '*Urban rhythms: A chronotopic approach to urban timespace*' serves as an introductory entry into chronotopic exploration of urban timespace. It establishes the basic theoretical foundations, introducing key terms and concepts that are further developed in the subsequent texts within this section across various urban contexts. Bakhtin's chronotope, Hägerstrand's pacemakers and Lefebvre's rhythmanalysis are central to the discussion, underscoring the polyrhythmic nature of urban spaces. Using empirical data from Brno, the study focuses on three primary urban rhythms: public transport schedules (local rhythms), shopping session durations

(supra-local rhythms), and daily work cycles (city-wide rhythms). These rhythms represent structured activities associated with specific groups of pacemakers. By analysing their interactions, the authors identify distinct urban chronotopes. Rather than providing an exhaustive account of all relevant rhythms and pacemakers, the identified chronotopes are presented as conceptual examples – a perspective on the dynamics of the urban environment. The article acknowledges its limitations in scope, noting that many rhythmicities are necessarily excluded from the analysis. These include informal, spontaneous, or less predictable rhythms, such as social gatherings, and even online interactions that blur the boundaries between physical and digital spaces. These omissions highlight the complexity and multifaceted nature of urban rhythmicity, which extends beyond the structured activities analysed in the study.

The study of Brno during its transition from an industrial to a post-industrial city demonstrates the application of chronotopic methodology to describe structural change of the pattern of urban everydayness. The paper '*Time–Space Rhythms of the City—The Industrial and Postindustrial Brno*' examines public transport schedules as a proxy to empirically explore the evolving rhythms of the city between 1989 and 2009. The bus public transport timetabling is utilized as a data source to uncover deeper socio-economic transformations as reflected in the existence, functioning and significance of various pacemakers. The analysis assumes a relationship between societal demands for public transport services at specific times and places and the corresponding adaptations of the public transport system to these demands. Methodologically, the study is distinctive in that it does not decompose the city into a mosaic of individual chronotopic units. Instead, Brno is conceptualized as a single, citywide chronotope, whose formative rhythms shift in response to changes in internal and external pacemakers. During the industrial era, the city's rhythms were dominated by a limited number of industry-related pacemakers, resulting in highly synchronized, almost isomorphic patterns of activity across the population. The post-industrial era introduces a more complex and diverse set of rhythmizers. Post-industrial Brno is more temporally fragmented, with multiple overlapping rhythms representing different social groups and practices. The findings highlight a stark contrast between the highly synchronized timespace of industrial urban society and post-industrial patterns of everyday routines that are desynchronized at the city-wide level while co-ordinated and negotiated within more individualized networks.

The third paper in this section, titled '*Urban chronopolis: Ensemble of rhythmized dislocated places*', represents a significant step forward in the development of chronotopic analysis of the city. Alongside the concepts of chronotope and rhythmanalysis, the paper explores and applies the concept of chronopolis in real urban conditions. Originally, the term *chronopolis* referred to spatially dispersed transnational communities sharing a common temporal rhythm (Laguerre, 2004). However, in this study, the concept is redefined to describe urban places that exhibit similar temporal rhythms despite being located in different parts of a city. The study identifies four types of chronopoles based on observations and narrative representations of their rhythmic profile. The search for rhythmic common features of urban places and their classification into sub-categories of chronopolis makes possible to draw a distinction between an urban place as a polyrhythmic set of different beats and a city as a polyrhythmia composed of differently rhythmized places. The concept of chronopolis thus allows us to understand the city as a set of chronotopes, where the routine sequencing and timing of successive activities ties together partial urban locations not only in space but also in time. In this sense, the study highlights the importance of understanding the interplay between local and supra-local rhythms and how these dynamics contribute to the overall function and structure of the city.

The paper '*Rhythm of urban retail landscapes: Shopping hours and the urban chronotopes*' applies a chronotopic approach to analyse retail store opening hours, illustrating the interplay of activity,

time, and place. Using an extensive dataset from 2013 that includes nearly 3,600 retail locations and their opening hours, the study examines the rhythms of the city through the temporal patterns of retail operations. The analysis identifies how the opening and closing times of stores create various chronotopic types throughout the day. At the conceptual level, the paper adopts a hybrid approach to understanding retail activities. The temporality of stores is viewed not merely as a response to shoppers' demand that is rhythmized by pacemakers outside the retail domain, but also as an expression of retail's capacity to act as an autonomous pacemaker, influencing the timing of other practices in the post-industrial city. Retailers do not only simply adapt to societal routines (like work schedules) but also actively shape them. For instance, large supermarkets open late into the night anchor specific nocturnal chronotopes, while small grocery stores and newsstands define the chronotopes of the morning. Retail spaces thus emerge as institutional agents, playing a significant role in defining and maintaining temporal categories – morning, afternoon, evening – that are internalized by the urban population. The article develops the argument that urban rhythms are not solely dictated by astronomical or biological cycles, but also socially constructed. These rhythms arise, in part, through various types of institutional spatiotemporal strategies, synchronized and synchorized (territorialized) with the spatiotemporality of everyday life.

The final contribution of this block is the paper '*Chronotopes of Urban Centralities: Looking for Prominent Urban Times and Places*'. This article advances the theory of urban studies by offering a new perspective on urban centres and centralities. Traditionally, centrality is associated with places in cities that hold high functional, symbolic, or social prominence – hubs or organizational nodes where everyday life converges. Authors question the conventional view of urban centrality as a static attribute tied solely to physical location of a place. Instead, they argue for a hybrid understanding of centrality that incorporates both spatial and temporal dimensions, recognizing that cities are not uniformly active across all times and places. Particular urban places usually exhibit a typical rhythm of presence of people or activities that exposes their centrality just at certain typical times. Rather than an ensemble of fixed, permanent centres, the city emerges as a shifting network of places (chronotopes) whose prominence fluctuates with daily rhythms and activities. Chronotopic concept is operationalized here using a diverse range of proxy data derived from pervasive technologies. These data sources include mobile network data and public occupancy data from parking lots, transportation hubs, and businesses provided by services like Google Popular Times. By employing clustering techniques, the authors identified locales with distinctive rhythms of human presence and linked their centrality to a specific time of day. The analysis resulted in the identification of three primary chronotopic types and seven subtypes of rhythmic sites. The daily 'rise and fall' of each locale's relative significance was then interpreted in a qualitative narrative form, capturing the spatiotemporal logic underlying fluid and dynamic nature of the lived and perceived urban environment.

6.3 Representations of Space, Time, and Technologies

The third thematic section consists of three papers that share a strong focus on the conceptualization and representation of space and time, viewed through historical, technological, and social lenses. These studies consistently explore how lived timespace is constructed, negotiated and, above all, represented in different contexts. Each paper offers a distinct perspective on the ways in which the representation of urban timespace is structured through daily routines, mediated by technology and distorted by historical and ideological forces. The concept of everyday life and routine serves as a unifying thread, spanning scales from individual experience (addressed in the first two papers) to the localized grand narratives that contextualize individual everyday experience (discussed in the final paper). Technology's role in mediating how

people interact with, and experience space is a critical theme across the papers, expressed with varying degrees of explicitness. The first paper examines how wheelchair technology reshapes its users' perception and conceptualisation of everyday space. The second paper extends this focus by exploring how older adults incorporate technologies such as mobile phones and debit cards into negotiations of their action and mobility spaces. The third paper then shifts to the planning and development of urban spaces in the socialist era, analysing how new forms of centrality were designed to integrate ideological and functional demands, with technology implicitly playing a role in these processes.

The papers share a qualitative methodological approach, employing case studies based on interviews and empirical data from Brno. Several passages of the papers go beyond the geographical research domain, addressing intersections of space, time, ideology, technology, and societal practices from a broader perspective that integrates geographical, sociological and historical approaches. This comprehensive scope enables the authors to capture not only the functional and material conditions affecting the representation of space but also symbolic dimensions of spatiotemporal relations and artefacts of everyday life. A strong symbolic and ideological dimension particularly links the second and third papers. It touches on the symbolic role of technologies in the life of older adults, not just as functional tools but also as elements contributing to their sense of security and place. Similarly, in the third paper, urban timespaces in socialist Brno are analysed for their symbolic role in constructing socialist identity, reflecting the centralities planned under ideological influence. While the papers may initially appear heavily theoretical and conceptual, they all make strong references to planning and decision-making practices. A key takeaway is the recognition of the significant gap between objective space and time embedded in conventional planning and technological metrics, and their perceived and lived image expressed through everyday societal and mobility practices. This tension is further mirrored in the juxtaposition of grand ideological or technological narratives with their reflection and adoption in the routines of everyday life.

The oldest paper in this last section, a study entitled '*Imaginace a reprezentace prostoru v každodenní zkušenosti*' [The Imagination and Representation of Space in Everyday Experience], provides a detailed exploration of how people actively construct and reproduce space in their daily lives. Space (and time) is described as multifaceted and dynamic, shaped by daily practices that vary depending on cultural, social, and technological factors. Drawing on post-positivist approaches, the authors present a pluralistic view of space that challenges the traditional Cartesian representation of universal and continuous space. A substantial part of the theoretical discussion is focused on a critical examination of three spatial dimensions, namely representation, scale, and perceived (dis)continuity. The paper discusses the dominance of topographic maps as the primary means of representing space and introduces a route-based concept of space. This alternative perspective focuses on the topological relationships between significant points, offering a representation more aligned with everyday experiences. Additionally, the paper highlights how the scalar experience of space is shaped by individuals' social roles, economic activities, and technological competencies. The everyday scaling allows individuals to navigate fluidly between different levels of spatial networks. Finally, the study challenges the notion of space as a continuous medium, proposing instead that space is increasingly experienced as a series of meaningful entities interconnected by routes or networks. The empirical portion of the article focuses on the spatial experiences of wheelchair users. Exploring the spatial imagination of people with mobility impairments allows the authors to critically shed light on the traditional perceptions of space as a relatively unproblematic category and to show some alternative types of representations embedded in the practices of everyday life.

Similar to the previous study, the article '*Technologies and the representations of activity spaces of older adults*' examines the representation of individual spatiotemporal routines and practices. This study situates itself within the broader framework of the relational geography of ageing, which explores the interactions between older adults, technologies, and their socio-spatial environments. It provides insights into the ways older adults engage with both physical and digital spaces, and how technology is selectively integrated into their routines, particularly with regard to maintaining security and minimizing risks in their daily lives. The relationships between everyday routines and technologies are conceptualized here as specific sociotechnical ensembles. These ensembles significantly shape older adults' activity spaces, mobility patterns and spatiotemporal rhythms. The research employs a mixed-methods approach, combining a questionnaire survey with semi-structured interviews. The survey aimed to gather a broad understanding of the technological competencies of the older population, while focus groups with a smaller sample of participants explored attitudes and practices related to technology use in greater depth. The findings reveal that older adults tend to adopt rather conservative strategies when integrating technology into their everyday lives. They prefer technologies that align with their established routines and are less inclined to accept those requiring substantial behavioural changes. The home emerges as a central point in older adults' activity spaces, serving as both a physical and emotional anchor. It is where most technology use is concentrated and holds a dominant position in the spatiotemporal patterns of their daily activities.

The issue of representation and symbolic structuring of the cityscape is examined in the final paper, titled '*Shifting prominence of places and times: multiple centralities of socialist Brno*'. The study revisits the concept of urban centrality by analysing the tension between grand planning narratives and the lived urban realities in socialist Brno. The paper builds its conceptual framework around centrality as a form of urban prominence, categorized into three ontological types. Centre-as-thing is represented by the physical forms of permanent urban structures, centre-as-structure posits the existence of a centre in relation to a periphery, and finally centre-as-event refers to temporally significant events, that confer prominence on specific locations. In the context of the building a socialist city, the paper argues that Brno's physical re-centralization was accompanied by efforts to reshape its symbolic landscape and introduce new temporal structures aligned with industrial urban culture. Socialist planning sought to distribute central functions across newly constructed residential areas, which were envisioned as symbols of the regime's commitment to social equality. However, the housing estates never fully achieved the centrality that socialist planners had envisioned. Lacking functional diversity and vitality, they often failed to rival the significance of pre-socialist structures, which remained embedded in the sedimented daily routines of Brno's inhabitants. The paper concludes that while the socialist regime sought to impose a new spatial and symbolic order on Brno, the existing spatiotemporal urban fabric proved highly resilient. The entrenched spatiotemporal patterns of everyday life exhibited a strong inertia, resisting the transformative ambitions of the regime.

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8. Supplements

| Paper 1

Sýkora, L., **Mulíček, O.**, 2009. The micro-regional nature of functional urban areas (FUAs): lessons from the analysis of the Czech urban and regional system. Urban Research & Practice 2 (3), 287–307. (WoS JIF Quartile: **Q2**)

Abstract
This article argues that any conceptualization and delimitation of functional urban areas must reflect their formation on the micro-scale and detect the smallest complete, complex, organic territorial units where the daily life of the population is organized. This is often neglected when a top-down approach is applied, leading to incomplete representations of reality that can misinform territorial policies. In presenting the analysis of the Czech urban and regional system, a major discrepancy between local results and the ESPON 1.1.1 report is documented. Our study shows that the daily life of the population is organized within a much larger number of complex micro-regions and functional urban areas than suggested by ESPON 1.1.1. We emphasize that a complex view of European territorial development has to integrate all scalar levels on which society operates in space, including the micro-regional nature of functional urban regions within which the daily life of the population is organized.

| Paper 2

Sýkora, L., **Mulíček, O.**, 2017. Territorial Arrangements of Small and Medium-sized Towns from a Functional-spatial Perspective. Tijdschrift voor Economische en Sociale Geografie 108 (4), 438–455. (WoS JIF Quartile: **Q2**)

Abstract
This contribution applies a functional-spatial perspective to the study of small and medium-sized towns. A methodology for functional analysis is developed and tested to identify towns, distinguish towns from cities, and detect town positionality within urban territorial arrangements, focusing on whether they are autonomous, networked with other towns or agglomerated with large cities. The methodology is used to compare settlement systems in two regions and two countries in Europe by looking at the existence and nature of networks between towns and cities and how towns perform in terms of population and jobs in respect of their belonging to different types of territorial arrangement.

| Paper 3

Mulíček, O., Malý, J., 2019. Moving towards more cohesive and polycentric spatial patterns? Evidence from the Czech Republic. Papers in Regional Science 98 (2), 1177–1195. (WoS JIF Quartile: **Q2**)

Abstract
Territorial cohesion discourse represents normative and ideological vision of ideal spatial practices that should be applied in order to ensure balanced and polycentric spatial development. However, spatial diversity of existing territorial settings often diverges from political representations of spaces. Using the Czech Republic as a case study, the paper focuses on the development of urban system hierarchy by analysing the changes of work-commuting flows in the post-socialist period. The results show that the configurations of everyday spatial routines and functioning of real urban systems differ from political imaginaries to a great extent and are moving towards a more polarized pattern.

| Paper 4

Mulíček, O., Osman, R., Seidenglanz, D., 2015. Urban rhythms: A chronotopic approach to urban timespace. Time & Society 24 (3), 304–325. (WoS JIF Quartile: **Q1**)

Abstract
This text attempts to examine the structuring of the urban environment, taking into account the geographically traditional spatial aspects of various phenomena as well as their temporal characteristics. It represents a response to this point of interest, providing a discussion of the chronotopic approach. The first part examines the concept of time and timespace, respectively, in the social sciences; particular attention is paid to the non-trivial aspects of the relationship between time and space. The abovementioned chronotope analytical and interpretive model is utilized throughout. For the purposes of this article, the model is defined as a specific part of the urban space defined by a unique temporality, i.e. based on a specific combination of overlapping rhythms. Such an approach opens up the possibility of regionalization on the basis of a specific temporality on different spatial scales. The empirical part of the text attempts to characterize the differentiation of urban space in Brno on the basis of a spectral analysis of three selected rhythms – the work cycle of a given locale, average duration of shopping session and public transport frequency. Model cases of selected urban chronotopes are subsequently developed on the basis of the rhythmicity of these activities.

| Paper 5

Mulíček, O., Osman, R., Seidenglanz, D., 2016. Time–space rhythms of the city–The industrial and postindustrial Brno. Environment and Planning A 48 (1), 115–131. (WoS JIF Quartile: **Q1**)

Abstract
This paper examines the transformation of the postindustrial city in terms of its temporal structure. It takes concepts of time geography, routine, and rhythmicity of the classic Lund school, Lefebvre's analysis of rhythms, and Crang's geographic application of the chronotope concept as its starting points. Analysing changes in the city bus transport services in Brno between 1989 and 2009, the paper attempts to capture in empirical terms the onset of the postindustrial phase of the city's development. While temporality of an industrial city can be characterized by a shared rhythm determined by a small number of dominant pacemakers (industrial plants), the deindustrialized city is associated with a significant weakening of such pacemakers cutting across the society and thus with a distinctive individualization of urban rhythmicity.

| Paper 6

Osman, R., **Mulíček, O.**, 2017. Urban chronopolis: Ensemble of rhythmized dislocated places. Geoforum 85, 46–57. (WoS JIF Quartile: **Q1**)

Abstract
The presented paper approaches everyday urbanism through rhythms. An urban place can be defined not only by its spatial attributes, but also through its affiliation to a particular spatiotemporal system. For this purpose, the paper employs two theoretical traditions – Lefebvre's rhythmanalysis and Bakhtin's concept of chronotope. Rhythmanalysis should be seen here primarily as a framing outline, whereas chronotope provides more analytical power to delimit temporally-defined urban place as a typological category. These two traditions however offer only limited possibilities to follow temporal connections among the set of spatially dislocated places. For this reason, this paper develops concept of chronopolis, reconceptualised at the city-scale level. This paper aims to (i) explore the nature of "urban polyrhythmia"; (ii) describe particular places as specific chronotopes; (iii) identify particular types of chronotopes based on the similarity of rhythmical profiles (chronopolis); and finally, (iv) to define the city as a set of particular chronopoles. The empirical part of the paper analyses daily rhythm profiles of 18 urban

localities within the space of Brno, Czech Republic. Particular types of chronopoles are identified according to their common rhythmical profiles stemming from the presence and absence of human users. The empirical part of the paper identified four different chronopoles (work-cycle, return, hot-spot, centre) that enable a description of the city as an ensemble of temporally rhythmized and spatially dislocated places.

| Paper 7

Mulíček, O., Osman, R., 2018. Rhythm of urban retail landscapes: Shopping hours and the urban chronotopes. Moravian Geographical Reports 26 (1), 2–13. (WoS JIF Quartile: **Q2**)

Abstract
Daily rhythmical patterns in the city are investigated in depth in this paper. The city is conceptualised here as a cyclical process and described by a sequence of relatively stable spatial-temporal stages. The concept of a chronotope is incorporated in the analysis of retail opening hours in the middle-sized city of Brno (Czech Republic), in order to identify distinct fusions of specific times and specific retail places and to examine their position within the daily rhythms of the city. There are distinct time-space retail configurations (chronotopes), which play crucial roles in the social negotiation and imagination of basic temporal categories, such as early morning, late morning, lunchtime, afternoon, evening, as being taken-for-granted in the urban context. More generally, the paper offers an example of the ways in which the specific daily rhythms of the city are produced and structured.

| Paper 8

Lískovec, R., Lichter, M., **Mulíček, O.**, 2022. Chronotopes of urban centralities: Looking for prominent urban times and places. The Geographical Journal 188 (2), 166–176. (WoS JIF Quartile: **Q1**)

Abstract
The aim of the paper is to discuss an issue of urban centralities not only in spatial but also in temporal terms. We seek to overcome the traditional view of urban centralities as materialised places. We argue that prominence of place is closely tied to a certain time regime or rhythm and that some prominent times tend to be spatialised through certain urban places. We emphasise the hybrid spatiotemporal nature of urban centrality that emerges from the inseparable coupling of the spatial and temporal dimensions of urban everydayness. The paper seeks to introduce timing, synchronisation and rhythms as important constituents of the urban tissue. The methodology links together Lefebvre-inspired rhythmanalysis and the concept of chronotope. A complex dataset that depicts the aggregated rhythms of people's presence in selected locales is employed to demonstrate multiplicity of prominent times present in the contemporary city. The chronotopes are narrated as recurrent situations in which specific urban locales and specific times linked together through the presence of interacting individuals. The spatiotemporal centrality is reflected in the story of the chronotope, describing its rhythm, scale, pacemakers, and actors.

| Paper 9

Mulíček, O., Osman, R., Seidenglanz, D., 2013. Imaginace a reprezentace prostoru v každodenní zkušenosti. Sociologický časopis / Czech Sociological Review 49 (5), 781–810. (WoS JIF Quartile: **Q4**)

Abstract
This article examines the imagination and representation of space in everyday life from the perspective of social geography. Drawing on cultural theory, the article presents space as a multifaceted entity that is perceived, constructed, and reproduced through everyday praxis. It stresses on the situatedness and

contextuality of the perception, construction, and representation of spatial categories and relations. To this end, three dimensions of space are discussed: (i) the representation of space in map form, one possible version of which is the concept of the route, founded on a topological representation of space; (ii) the scalar dimension of space, which involves the scaled representation of everyday space and the various socially, economically, and culturally determined scalar levels on which everyday experience occurs; (iii) the dimension of spatial continuity, which the authors discuss in conjunction with reflections on the ways in which space is represented, and next to the notion of space as an omnidirectional continuous medium they introduce a concept in which space is understood as a series of separate, meaningful entities integrated through mobile technologies to form a time-space network. This theoretical discussion is accompanied by an empirical section that draws on the spatial experiences of five users of power wheelchairs to describe examples of technologically and culturally conditioned imaginations of space.

| Paper 10

Mulíček, O., Stachoň, Z., 2019. Technologies and the representations of activity spaces of older adults. Geografiska Annaler: Series B, Human geography 101 (4), 307–321. (WoS JIF Quartile: **Q2**)

Abstract
Technology, in its various forms, mediates encounters between individuals and the lived time–space. Mobile phones, internet, navigation systems, and advanced transport technologies dramatically change the ways in which space and time are conceptualized, represented, and embedded into societal practices. This paper explores the routine spatiotemporal practices of older adults, who lie outside mainstream technology use. Attention is paid to the role of digital technologies in negotiating and representing the everyday activity spaces. We attempt to capture the logic of everyday tactics, which is based not only on rational reasoning and habitual spatial thinking but also on a more subtle mix of experiences, possibilities, and fears associated with the use of various technological devices and systems.

| Paper 11

Lichter, M., **Mulíček, O.**, 2024. Shifting prominence of places and times: multiple centralities of socialist Brno. European Planning Studies 32 (6), 1337–1354. (WoS JIF Quartile: **Q1**)

Abstract
This paper aims to take a closer critical look at the multiple and multi-layered nature of urban centrality. Centrality is conceptualized here as a kind of prominence, perceived, planned and represented quality within the urban timespace. We employ three distinct ontological categories of the urban centre (centre-as-event, centre-as-thing and centre-as-structure) to take a deeper insight into the symbolism, ideological narratives and planning practices behind the genesis of the prominent urban places and times. With this approach, we expose even the seemingly subtle phenomena that (co-)shape multiple urban centralities. We are empirically focusing on the case of the city of Brno (Czech Republic). Attention is paid in particular to the period of socialism, more specifically to the influence of socialist ideology on the reorganization of urban central places and times. We are trying to overcome the traditional view of centralized and all-encompassing socialist transformation. Instead, the socialist Brno provides the case study to demonstrate a subtle fabric of overlapping, competing or simply coexisting socialist and pre-socialist centralities. We argue that the physical re-centralization of the city was in the end less significant than the efforts to symbolically recode the urban environment.

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The micro-regional nature of functional urban areas (FUAs): lessons from the analysis of the Czech urban and regional system

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This article argues that any conceptualization and delimitation of functional urban areas must reflect their formation on the micro-scale and detect the smallest complete, complex, organic territorial units where the daily life of the population is organized. This is often neglected when a top-down approach is applied, leading to incomplete representations of reality that can misinform territorial policies. In presenting the analysis of the Czech urban and regional system, a major discrepancy between local results and the ESPON 1.1.1 report is documented. Our study shows that the daily life of the population is organized within a much larger number of complex micro-regions and functional urban areas than suggested by ESPON 1.1.1. We emphasize that a complex view of European territorial development has to integrate all scalar levels on which society operates in space, including the micro-regional nature of functional urban regions within which the daily life of the population is organized.

Keywords: functional regions; functional urban areas; complex micro-regions; urban and regional system; Czech Republic

Introduction

This article focuses on functional urban areas (FUA) in the Czech Republic. It is written in response to the results of ESPON 1.1.1, 'Potentials for polycentric development in Europe' (ESPON 2005). We argue that ESPON 1.1.1 does not provide adequate information about the nature of the Czech urban and regional system. ESPON 1.1.1 identifies 25 FUAs in the Czech Republic, while analyses of the Czech settlement system made for 1970, 1980, 1991 and 2001 (Hampl *et al*. 1978, 1987, Hampl and Müller 1996, Hampl 2005) provide a very different picture. The most recent of these studies (Hampl 2005) identified 144 labour-market micro-regions for 2001. Comparing ESPON 1.1.1 with the overview of functional regions in OECD countries (OECD 2002) reveals that similar differences between ESPON results and common understandings of the respective regional structures exist in other countries as well. This discrepancy between the representation of FUAs in ESPON 1.1.1 and the local and national knowledge of settlement and regional systems and practices regarding functional regions suggests that there are systematic differences between ESPON 1.1.1 and vernacular national understandings that warrant careful scrutiny.

The article has several aims. The principal aim is to present an analysis of the Czech urban and regional situation. Its primary goal is to delimit functional urban areas. Based

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on local analysis, we will critically comment on the results of ESPON 1.1.1, arguing that this report failed to identify functional regions at the micro (regional) level. We think that this shortcoming was conditioned by the main goal of ESPON 1.1.1 – that is, to study polycentricity from a macro (European) scale. However, as the results of ESPON 1.1.1 are widely used in Europe and within individual EU member states, they may be misleading, and wrongly influence the process of policy formulation, since the representation of urban areas in ESPON suggests that areas outside ESPON FUAs are peripheries. However, smaller job centres and their regions are vital and important socio-economic territorial units, certainly in the Czech urban and regional context. Therefore we argue that in any analysis and representation of territorial systems, all important job centres and their regions should be taken into account, not only the largest urban centres, as the priority places for national (and EU) competition policies. The primary dividing line should not be between smaller and larger urban centres and their respective FUAs, as they are qualitatively the same phenomenon, but between those settlements which play the role of urban centres and those which do not.

Assuming that FUAs should reflect and be the base for consideration of the key imperatives underlying socio-economic territorial development (i.e. economic competitiveness and social cohesion), we need to recognize them as the micro-level territorial systems that represent the daily-life spaces of the population (Hägerstrand 1987). Hence, we will address the question of functional urban areas from a bottom-up perspective. We seek to identify the smallest complete territorial units within which the daily life of a substantial part of the population takes place without excessive need to travel for jobs and services to other areas or their urban centres.

In addition, we argue that it is necessary to acknowledge significant differences between urban and regional systems in individual European countries. While some countries are characterized by higher levels of concentration in major urban centres, there are countries and regions with functioning smaller urban centres and their respective regions. The European approach to the regional system cannot be based on the application of uniform size criteria across Europe, as suggested in ESPON 1.1.1 (ESPON 2005, pp. 4–5) without taking into account qualitative differences between countries. The European view must recognize national and regional variability and respect the plurality and differences in the functional aspects of regional structures within specific national and regional contexts.

We strongly support the use of functional urban areas as an important functional subdivision of territories (OECD 2002, p. 11). They can be used as an analytical framework for territorial studies, as well as a territorial framework for local and regional policies. If FUAs used in analyses and policies do not reflect the nature of the settlement and regional system, it may generate shortcomings and inadequacies in policy formulation and decision-making. The analysis of settlement systems with an aim of delimiting FUAs has to acknowledge the nature of regions on a micro scale. Therefore, the paper begins with a general conceptual discussion of the nature of functional urban areas. It refers to the most important works on functional urban regions, presents different views on functional regions, and discusses the key aspects of functional regions. Reflecting this conceptual work, we present a method for the identification and delimitation of FUAs that was applied in the analysis of the Czech Republic. The paper presents a sequence of steps in the analysis and its empirical outcomes. In the first step, we identify major job centres in the country. Using data about commuting to work, we delimit FUAs for 2001 and 1991. Then we provide the basic characteristics of Czech FUAs, compare 2001 with 1991 and highlight the main development trends. The final discussion summarizes our main

findings and suggests how to adjust the conceptualization of FUAs and their analysis in contexts similar to the Czech settlement system.

Functional region: a history of the concept

The functional region is not a new concept; indeed, throughout history it has acquired several distinct meanings. We use 'functional region' as a general term to refer to territorial units that are spatially integrated by the population's socio-economic activities. We specifically focus on the micro level, where the most important mechanism of the spatial integration of human activities is the repetitive daily relation between homes and jobs through commuting to work. While the core of the concept refers to the socio-economic region tightly organized around urban cores, there are important differences between the various ways the term is used. The following discussion of the concept of functional region intends to provide a very brief historical overview pointing to selected works on functional regions with a special focus on their main forms.

Since the 1950s, the United States Census Bureau has used the term 'standard metropolitan statistical areas' (SMSA), which are defined and delineated according to the integration of socioeconomic activities in urbanized territory. SMSAs cover the most urbanized parts of the United States. Berry (1973), in his study of the US settlement system, adopted the term 'daily urban systems' (DUS), which differ from SMSAs. Using data about commuting to work, he delineated regions that exhaustively cover the whole territory of the United States. While both SMSAs and DUSs represent functionally integrated territorial units, they differ in one substantial aspect. In both cases, a key role is played by central places that concentrate jobs and attract commuters from wider hinterlands. However, SMSAs represent highly urbanized regions characterized by a high degree of spatial intensity and the integration of socioeconomic activities represented by commuting directed towards core cities, leaving less urbanized areas outside functional urban regions. DUSs are different: they cover the whole territory (however, there are scholars who use DUS in the former meaning similar to SMSAs in the United States, for instance van der Laan 1998). Each settlement is part of a DUS even if it is linked to its core by weak ties. This distinction between functional territorial units that represent only highly integrated urban areas and functional territorial units that include highly urbanized cores as well as less urbanized, rural and peripheral territories is a crucial one for the understanding of the nature of urban systems and the meaning of functional regions.

Functional regions have been intensively investigated and used in settlement and regional planning in North America and Europe since the 1960s (Bourne 1975, Hall and Hay 1980). Hall and Hay (1980) provide a comprehensive overview of approaches, methods and results for many countries. An overview of recent practices was published by OECD (2002). In most countries, regionalization is applied. Inspired by Walter Christaller's 'central place' theory (Christaller 1933), regionalization divides the whole country into regions. Regionalization usually identifies nodal regions with strong labour centres to which the surrounding hinterland is linked by commuting. Often, a minimum threshold size of the centre or the whole region is applied. Functional regions are based on local labour markets as basic mechanisms that integrate territory through linkages between places of home and work. In some countries, such as Canada or France, functional regions are understood as urbanized and functionally integrated urban areas that do not cover the whole country. In that case, a threshold of minimum intensity of commuting to the urban centre is applied for the spatial delineation of functional urban regions. Here again, we can see the two key variants in the delimitation of functional regions that either

reflect the complete regionalization of a country or the spatial delimitation of the most urbanized and socio-economically integrated core areas.

An alternative approach to regionalization, applied in the UK, uses a concept of 'travel-to-work-areas' (TTWAs) (Coombes *et al.* 1982, Robson *et al*. 2006), and in the Netherlands, 'local labour-market areas' (LLAs) (van der Laan and Schalke 2001). The same goal of regionalization through the identification of relatively autonomous self-contained areas is fulfilled by the use of a different technique, which is sometimes referred to as bottom-up or inductive in order to distinguish it from a top-down or deductive approach that primarily starts with the identification of urban centres. The identification and spatial delimitation of TTWAs does not require the predefined set of centres to which hinterlands have been attached. Instead, TTWAs are based on the analysis of commuting flows in the whole matrix of municipalities. The method of their delineation uses a specific algorithm that successively aggregates adjacent territorial units with the strongest linkages and calculates the level of self-containment (defined as the share of commuting enclosed within the region) within these newly formed areas until the whole country is divided into TTWAs or LLAs. The concept and methodology of TTWAs and LLAs better reflect the existence of polycentric regions and territorial integration based on multidirectional and reciprocal commuting. The emphasis on self-containment, as the key characteristic of FUAs, was also employed in a traditional top-down regionalization by Karlsson and Olsson (2006), who accepted only highly self-contained municipalities (in the terms of labour market, i.e. jobs and commuting to work) as job centres.

As in Western capitalist countries, regionalization was applied in socialist states. In the Czech Republic (and former Czechoslovakia), regionalization involved the selection of centres and the delineation of regions on micro and meso levels within the country as a macro-region. The micro-regions were conceptualized as local labour market regions and their spatial delimitation was based on commuting-to-work data from population censuses. Micro-regions were amalgamated to second-rank micro-regions, and further to two levels of meso-regions (their spatial delimitation also reflected other socio-spatial processes, such as migration). This regionalization exists for 1970 (Hampl *et al.* 1978), 1980 (Hampl *et al*. 1987), 1991 (Hampl and Müller 1996) and 2001 (Hampl 2005). During the socialist era, regionalization was an integral part of national settlement and regional policy. In the 1990s, it was used in disputes about the reform of the territorial administration supporting the argument that administrative regions should correspond to self-contained areas (Dostál and Hampl 1993, 1999, 2007, Hampl 2005), understood as regions within which socio-spatial processes are relatively enclosed. At present, micro-regions are no longer used in Czech policymaking, although they sometimes serve as an analytical territorial framework for the analysis of regional disparities. Their full utilization, however, is restricted by limited data availability. Functional urban areas are used for the study of urban growth and suburbanization in particular. They stand for metropolitan or urban regions delineated as regions consisting of an urban centre and an immediate and strongly integrated hinterland (for instance Novák and Sýkora 2007, Ouředníček 2007, Sýkora and Posová 2007, Sýkora and Ouředníček 2007). The spatial delineation for these purposes is done on a case-by-case basis specifically for individual cities, and has differing aims. On a policy level, FUAs are discussed in relation to the polycentricity agenda pursued by the EU (Maier *et al*. 2007). The alternative concept of travel-to-work-areas has not yet been applied in the Czech Republic.

Functional regions do not usually correspond with the administrative boundaries of supra-municipal territorial units, i.e. with regions and districts. Hence, their use in policy-making is often problematic (van der Laan and Schalke 2001), and only a few countries

use them as a framework for the implementation of some policies (OECD 2002). More often, they are used for analytical purposes as elemental territorial units perceived as being natural and organic. There are two major fields of research in which they are used. In the first field, functional regions are used as the basic building blocks of regional systems on a national and supranational level. Through the assessment of population and employment changes and their difference between regions, trends in urbanization and regional development on a supra-regional level are detected (for instance Hall and Hay 1980). Functional urban areas were used in ESPON in a similar manner. Despite the fact that they do not cover the whole territory, their main function was to make evident uneven territorial development within the EU. The second major field of research focuses on the assessment of internal differentiation within functional regions. Van den Berg *et al*. (1982) used functional urban regions for the evaluation of growth and decline in core, ring and the whole functional urban region to classify whether functional urban regions are in the stage of urbanization, suburbanization or desurburbanization. Similarly, Pumain (2004) used the French term *aires urbaines* for the study of urban sprawl. In our study, we see functional regions as micro-scale organic territorial units that are the basic building blocks of urban and regional systems.

The nature of functional regions

Functional regions, functional urban regions, functional urban areas, daily urban systems, local labour areas, labour market regions, micro-regions or travel-to-work areas share much in common. Yet, as the previous section shows, there are important differences between them. In this section, we discuss the key aspects shared by these concepts, key differences between them, and the utility of such similarities and dissimilarities.

Functional regions and their variants are the basic complete units of urban and settlement systems. They are the micro-territorial units of societal organization in space. We can see them as the cells of the tissue of socio-economic landscapes. Together, they form territorial units integrated on higher scale levels, such as EU NUTS II meso-regions or transnational formations such as the European Union. Therefore, the European Commission and the governments of member states consider functional regions as the basic socio-spatial structural elements of their territories. Functional regions can be internally disaggregated, but not into functionally complete areas. Internally they consist of specialized territories such as places of production, services and residential areas mutually interconnected with transportation and telecommunication networks, flows of population, finance and information. The major aspect of this internal spatial differentiation is the distinction between centres and other places. Centres spatially concentrate functions that attract people and human activities from non-central areas. A functional region is bound together through the division of roles between places of residence and places of work and services, which are on a daily basis integrated via transportation, telecommunication, commuting and flows of information. A very important feature is that daily social life mainly takes place within the borders of these functional regions. Although functional regions have increasingly become integrated with the outside world and have become significantly shaped by their external relations (Massey 1993), they have kept some autonomy and independence. Yet the smallest and more weakly integrated functional regions, usually located close to major urban centres, can, due to continuing concentration processes and competition between places for investments and jobs, lose their autonomy and independence, and dissolve into adjacent regions of larger cities or stronger centres. Studies by Hampl *et al*. (1987), Hampl and Müller (1996) and Hampl (2005) confirmed that the number of labour micro-regions

in the Czech Republic decreased from 151 in 1980 to 147 in 1991 and 144 in 2001. The existence of functional regions is thus an outcome of the interaction between the forces of intra-regional integration and those of external inter-regional competition and cooperation (similarly, although from a different angle, van der Laan [1998] points to the hybrid nature of the urban system in the Netherlands, with various combinations between local and regional labour markets). The long-term development of regional systems is characterized by a merging of existing functional regions into a smaller number of regions with an increasing average size and a growing extent of peripheral areas outside the urbanized core regions.

Functional regions are the basic territorial units characterized by the internal functional complexity and integrity of social organization in space. The complexity and integrity of this socio-spatial unit is given by the presence of and mutual linkages between places of residence and places of work and services. Functional regions are settlement systems internally organized around urban cores. Their key spatial organizational principle is centrality, which usually takes the form of a single strong node and surrounding territories functionally linked to that node. As advanced territorial division of labour leads to more complex forms of territorial organizations, functional regions can have more centres, usually with one dominating over others and/or with internal functional specialization distributed among these centres. Only rarely do we find functional regions with a more equal polycentric structure of centres.

In summary, functional regions are characterized by internal complexity (containing all or most basic functions needed in the daily life of a population), integrity (these functions are strongly mutually related via the concrete daily activities of inhabitants within the territory of a functional region) and centrality/nodality (the functional division has a specific spatiality that relates central places with their hinterlands). The internal organization has strong daily dynamics due to people commuting from home to work, schools, shopping, entertainment and sport facilities, and so on. Functional regions can be seen as a special type of organic unit existing in landscapes due to the intricate organization of social activities in space. They are the spatial systems of daily life with a specific internal spatial organization. At the same time, they are also part of larger territorial complexes.

Despite these common principles, there are different concepts of functional regions. Karlsson and Olsson (2006, p. 2) define ‘the essence of a functional region’ as ‘a system of highly connected smaller and larger places’. Functional regions are often conceptualized as areas that integrate cities with their immediate hinterland. In this instance, functional regions are based on strong bonds and intensive daily flows within the territory. However, if we consider the whole settlement system, only areas intensively linked with urban cores belong to functional regions, while peripheral territories within these strongly integrated urban regions remain outside of them. Functional regions are thus conceptualized as city regions, urbanized territories functionally integrated around urban labour markets and other urban functions. This type of functional region integrates cities and suburbs while leaving exurban peripheries outside.

An alternative concept of functional regions is based on the division of the whole territory (of a country) into micro-regions that consist of cities and their suburbs as well as more remote peripheral areas, which are more loosely but still functionally linked to urban nodes. Each settlement in the territory thus belongs to one of these micro-regions. In highly urbanized territories with strongly overlapping spheres of city influence, the areas of urban regions may cover the same extent as the micro-region, whereas in territories with a lower density of centres and large peripheral areas in-between, urban regions form only the central parts of the micro-regions.

In the following, we distinguish between 'functional urban areas' FUA and 'complex micro regions' (CMR). As the term 'functional urban region' (FUR) has been used in both above-mentioned meanings, we use its variant, FUA, introduced by ESPON to refer to functional territorial units that represent areas of strong integration between urban cores and their immediate hinterland. By CMR, we understand functional regions that are formed through socio-economic links of each settlement to urban cores. They contain not only the intensively linked hinterland but also areas more remote from the urban core loosely related peripheral areas. CMRs completely and exhaustively cover the whole territory. This full territorial coverage might not be justified in territories with very low levels of human activity, sparse settlement and hence limited integration of such territories with urban cores. We presuppose, however, that in urbanized countries most areas are related, at least loosely, to some urban core.

FUA and CMR are closely related concepts. FUAs actually represent the urbanized and intensely integrated core areas of CMRs – that is, places where most social activities are spatially integrated on a daily basis. The areas of CMR outside FUA are peripheral parts more loosely connected to urban cores (Figure 1). The centres of FUAs and CMRs coincide, but they differ in inclusion (CMR) or exclusion (FUA) of peripheral areas. Therefore, FUA is a subset of CMR. Consequently, any identification and delimitation of FUAs should reflect the division of the territory into CMRs. CMRs are the elemental cells of settlement and regional systems. They are more loosely integrated in comparison with FUAs, due to their peripheral position. On the other hand, they completely cover the territory (at least in spaces permanently inhabited by people) and the level of their completeness is the same or higher in comparison with FUAs as their peripheries can contain features and functions that may not be found in their urban cores. Their complexity can also be higher than that of FUAs, although only marginally, as most of the region-constitutive functions

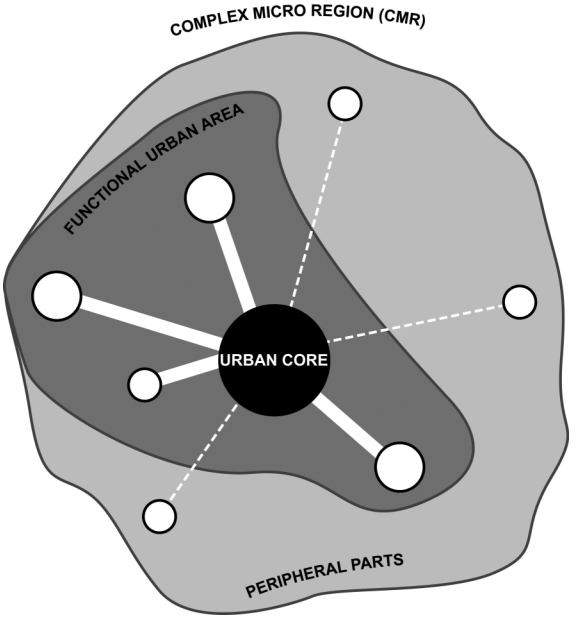

Figure 1. Scheme of Functional Urban Area (FUA) and Complex Micro Region (CMR).

(i.e. those which integrate society in the space of an urban region) can be found within the borders of FUAs and especially within their urban cores.

This distinction between FUAs and CMRs has important implications and relevance for analyses, representations and policies of territorial development. For instance, suburbanization – with its tight functional links between places of residence and work in both suburbs and cities – is a process that shapes FUAs, takes place within them, and thus has problematic outcomes that are addressed at the level of FUAs. Another example that shows the relevance of the distinction between FUAs and CMRs is the formation of peripheries that are remote from urban cores, are not well connected by transport to urban centres, and cannot fully utilize the benefits provided by cities to their hinterlands. Such peripheries fall within the scope of a CMR, but outside that of a FUA.

Territorial policies need to address particular issues in urban and regional development from a perspective that reflects the spatial field within which these processes are constituted. For instance, the above-mentioned process of suburbanization and urban sprawl can hardly be addressed at the level of individual municipal governments. Its negative effects, which threaten the sustainability of urban development, should therefore be addressed at a level that includes the whole territories of FUAs. While suburbs are sometimes seen as parasitical on central cities, peripheries loosely related to major urban cores often cannot make full use of urban services. While suburbs can often fully enjoy the advantages provided by cities, peripheries are in a position that does not allow them to fully benefit from urban functions. Therefore, any policy aiming at territorial cohesion should consider the territoriality of socio-economic processes within CMRs and FUAs as integrated yet spatially, internally differentiated, units. Furthermore, the internal differences within complex micro-regions, especially the level of polarity between urban cores and their peripheries, also have significant implications for inter-regional disparities. The above remarks are meant as examples and suggestions for further considerations about the analytical and political relevance of CMRs and FURs.

Complex micro-regions and functional urban areas in Czechia

The Czech Republic is a highly urbanized country with a densely, yet spatially fragmented, settlement network (22,699 settlement units divided into 6258 municipalities with elected local governments in 2001). Cities, towns and villages are organized into several tiers of settlement and regional hierarchy. The country does not have any real peripheries characterized by low levels of human activity, physical remoteness and/or socio-economic isolation from main urban centres. There are so-called inner peripheries in the sense of rural areas remote from urban poles (Musil and Müller 2008) and military training fields, where functional linkages to urban centres are weak in comparison with urban hinterlands. However, the extent of these peripheral areas is relatively small; they do not form any large self-standing territories. They have the status of peripheral parts of micro-regions. Therefore, the whole country consists of micro-regions with distinct job and service centres. The Czech settlement system has certain specificities due to its high territorial fragmentation. There are many small towns that play the role of centres for their rural hinterlands. The population of such towns can be less than 5000 people and their labour market areas are relatively small, yet they are still characterized by a certain autonomy in terms of their daily life. In the Czech context, they are the lowest tier of centres and complex micro-regions. This specific nature of the Czech urban and regional system is acknowledged in the method we use for the delimitation of FUAs.

This section presents the steps in our analysis of the Czech settlement system. The aim was to reveal FUAs. Our method involved three basic steps: identification of centres, delimitation of CMRs, and delimitation of FUAs. The analysis was carried out for 2001 to ascertain the most recent situation; for 1991, to diagnose the situation at the beginning of the transformation from communism to capitalism; and to identify development trends in the urban and regional system between 1991 and 2001. We used a relatively limited set of data from the population censuses of 2001 and 1991: data about the population, the number of economically active and unemployed for each municipality, and data about commuting to work between municipalities.

Job centres

Settlements play the role of centres because of their concentration of jobs, supply of services and administrative functions. These functions generate strong ties and flows between a centre and its region/hinterland. On the micro level, the labour market is the most important function, because the daily life of the majority of the population depends on the provision of jobs and their spatial location. Other functions, such as retail, social services or entertainment, usually follow the regional pattern in regard to the location of jobs. Furthermore, job commuting has a higher intensity and is more regular in comparison with other types of relations such as commuting to schools, or journeys for shopping or entertainment. Therefore, the aim of the first step in the analysis is to identify those settlements that play the role of job centres (Forstall and Greene 1997, Greene 2006).

However, what is a job centre? We have considered several propositions. They are not exhaustive, yet we think they cover the most important aspects of the functional role of job centres as micro-regional cores:

- A job centre is a place with a sufficient number or concentration of jobs. Hence, the question arises about what the minimum concentration/threshold value is. For the initial round in the Czech context, we included all settlements with at least 1000 jobs.
- A job centre is a place where the number of commuters to jobs in the given settlement is higher than the number of residents of this settlement that commute to jobs outside this settlement.
- The role of a job centre implies that the settlement should have a higher concentration of jobs in relation to its residential function. We compared the number of jobs in proportion to the number of residents for each settlement in the country. When the number of jobs as a percentage of the country's total number of jobs was higher than the number of residents as a percentage of the country's total population, we considered a settlement to be a job centre.
- A job centre is supposed to form a hinterland consisting of settlements related to the centre through commuting to work. Therefore, a job centre has to be the main commuting destination for at least one other settlement.

The use of these four criteria revealed some specific issues. A substantial number of job centres, even those with far more than a thousand jobs, did not fulfil the condition of a positive commuting balance and/or did not have stronger employment than residential significance. Table 1 presents the variants with criteria used for the identification of job centres for 2001 and 1991.

Which cities did not fulfil the criteria, and under what circumstances? Specific situations were found especially in the highly urbanized areas of Central Bohemia, the region

Table 1. Variants of job centres in the Czech Republic (2001 and 1991).

Job centres	2001	1991
1000 and more jobs	493	522
1000 and more jobs and in-commuting > out-commuting and percentage of the country's jobs > percentage of the country's population	262	311
1000 and more jobs and in-commuting > out-commuting and percentage of the country's jobs < percentage of the country's population	17	12
1000 and more jobs and in-commuting < out-commuting and percentage of the country's jobs > percentage of the country's population	20	24
1000 and more jobs and in-commuting < out-commuting and percentage of the country's jobs < percentage of the country's population	193	175
1000 and more jobs and in-commuting > out-commuting and percentage of the country's jobs > percentage of the country's population and main commuting destination for at least one other settlement	223	278
1000 and more jobs and main commuting destination for at least one other settlement	367	407

Source: Czech Statistical Office 1991, 2001.

around the capital Prague, and in the North Bohemian and Silesian/Ostrava conurbations. For instance, in 2001, the cities Most, Karviná, Chomutov and Krnov, the first three with a population over 50,000 and all with more than 10,000 jobs, did not fulfil the criterion of a higher percentage of the country's total number of jobs than the percentage of the country's total population. All of them are important centres in either North Bohemian or Silesian agglomerations. However, as there are more important job centres in these urban agglomerations, the relative strength of their residential role slightly prevails over their job function, despite the fact that they provide a large number of jobs. The group of centres with a more significant employment than residential function, but with larger out-flow than in-flow of commuters, include smaller towns with a population of less than 15,000, in which the population make use of the job opportunities in nearby bigger cities. The third large group of centres with 1000 and more jobs, which had a negative commuting balance as well as a lower percentage of the country's total number of jobs than the percentage of the country's total population, consists of a whole spectrum of cities from mid-sized to small settlements. In 2001, three of them had a population of more than 50,000 (with the number of jobs over 20,000) and the other 18 had over 10,000 residents.

Kladno, an industrial centre in Central Bohemia, can serve as an example. In 2001, from a population of 71,132, 38,098 residents were economically active, including 3851 unemployed. Kladno attracted 9745 in-commuters, while there were 12,311 out-commuters (most of them leaving daily for Prague). The total number of jobs was 31,681, calculated as the economically active minus the unemployed plus the in-commuters, minus the out-commuters. The significant strength of Kladno in terms of jobs was, however, outpaced by the negative commuting balance and its 7% portion of the country's population compared with its 6.6% portion of the country's number of jobs.

However, the question arises as to whether places such as Kladno are job centres. Most of these towns experience a strong impact from a larger city in their proximity.

Although these towns provide many jobs and attract significant commuting in-flows, they are also characterized by a large out-commuting of their own population to bigger urban centres and a lower employment than residential function. Nevertheless, in spite of a certain degree of dependency on a stronger city in the vicinity and a higher commuting out-flow than in-flow, these cities play important roles as centres on the micro regional level.

If we look at it from a different angle, the dependence on a large city can also be interpreted as the utilization of richer job opportunities in a wider polycentric region. This is an important difference in approach from some approaches to the selection of job centres which restrict the selection of centres to highly self-sufficient municipalities in terms of the labour market, for instance, in Sweden (OECD 2002, Karlsson and Olsson 2006). In Sweden, self-sufficiency is understood as the situation when the majority of the resident population works in the municipality with a maximum of 20% of employed residents commuting to work outside of the municipal territory. The above example of Kladno would, with its 12,311 out-commuters that account for 36% of the working resident population of 34,247, be far over the Swedish criteria of self-sufficiency. Yet we see Kladno to be in a double position: firstly, it is an important job centre in the micro-regional context and, secondly, it is also a type of residential suburb of Prague in a meso-regional context. While the aggregate picture represents Kladno as a somewhat weaker centre, it is still an important and strong local labour market.

Based on the above argument, we think that towns with 1000 and more jobs, which do not fulfil the other two criteria, cannot simply be seen as non-centres. We prefer to consider them as a specific type of job centre. They often represent secondary tiers of job centres in metropolitan regions. We see them as integral parts of wider intensely urbanized and, by commuting, integrated territories. However, instead of subordinating them directly to nearby bigger centres, we think that provided they fulfil the fourth condition (i.e. they are the destination of the highest commuting flow from another municipality), they prove their role of a centre having a certain sphere of micro-regional influence. We also think that municipalities that are not strong enough to become the major commuting destination from another municipality are not justified in being selected as a job centre of national significance. Yet they should be considered as important job centres within the polycentric structures of their respective metropolitan and urban region.

Consequently, we decided to omit the second and the third criterion and defined a job centre as a municipality with at least 1000 jobs, which is, at the same time, the main commuting destination for at least one other municipality. The number of jobs was calculated for each municipality from the number of economically active inhabitants minus the unemployed plus the commuting-to-work balance. Nearly 8% of Czech municipalities (493 out of 6258) fulfilled the criterion of a minimum 1000 jobs in 2001 (the figure for 1991 is slightly higher, with 522 municipalities). Subsequently, the highest outgoing flow was identified for each municipality, including destination municipalities of these flows. There were 645 municipalities classed as main destinations for commuting from another municipality. The intersection of these two samples resulted in a set of 367 job centres with 1000 and more jobs that were, at the same time, the major commuting destination from at least one other municipality in 2001 (Figure 2). For a comparison, there were 407 of these job centres in 1991 (Table 1).

Complex micro-regions

The next step of the analysis was the regionalization of the Czech Republic in a model that linked all municipalities to one of the 367 identified job centres. Municipalities were

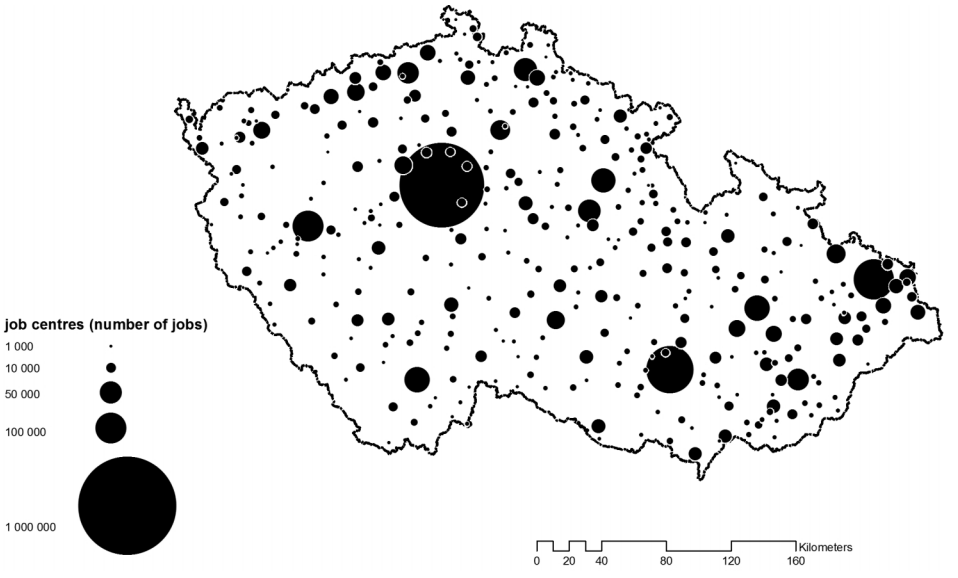

Figure 2. Job centres in the Czech Republic (2001).

linked to centres via the criterion of the strongest commuting-to-work flow. If the largest flow was not directed to one of the identified job centres, the municipality was indirectly linked to a job centre. If the strongest commuting destination B of a municipality A was not a job centre (JC), then municipality A was linked to the JC that was the main commuting destination of municipality B (see Figure 3). This method resulted in proto micro-regions (PMRs). The territories of PMRs were often spatially fragmented, especially in areas halfway between two centres. Therefore, we spatially consolidated PMRs into continuous territories. In the border zones, the relations to both competing centres were usually weaker and relatively equal. Furthermore, settlements at the borders of regions were usually quite small. Therefore, prioritizing territorial coherence to the exact orientation of the major commuting flow can be justified by higher gains from territorial consolidation in comparison with rather marginal changes in the total size of spatially adjusted and consolidated regions.

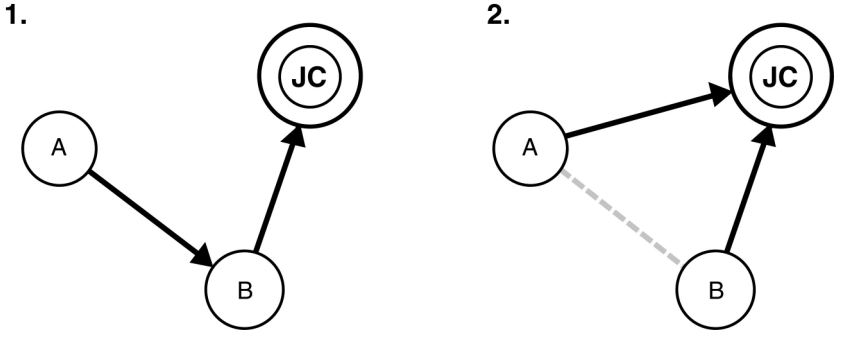

Figure 3. Regionalisation of municipalities to job centres.

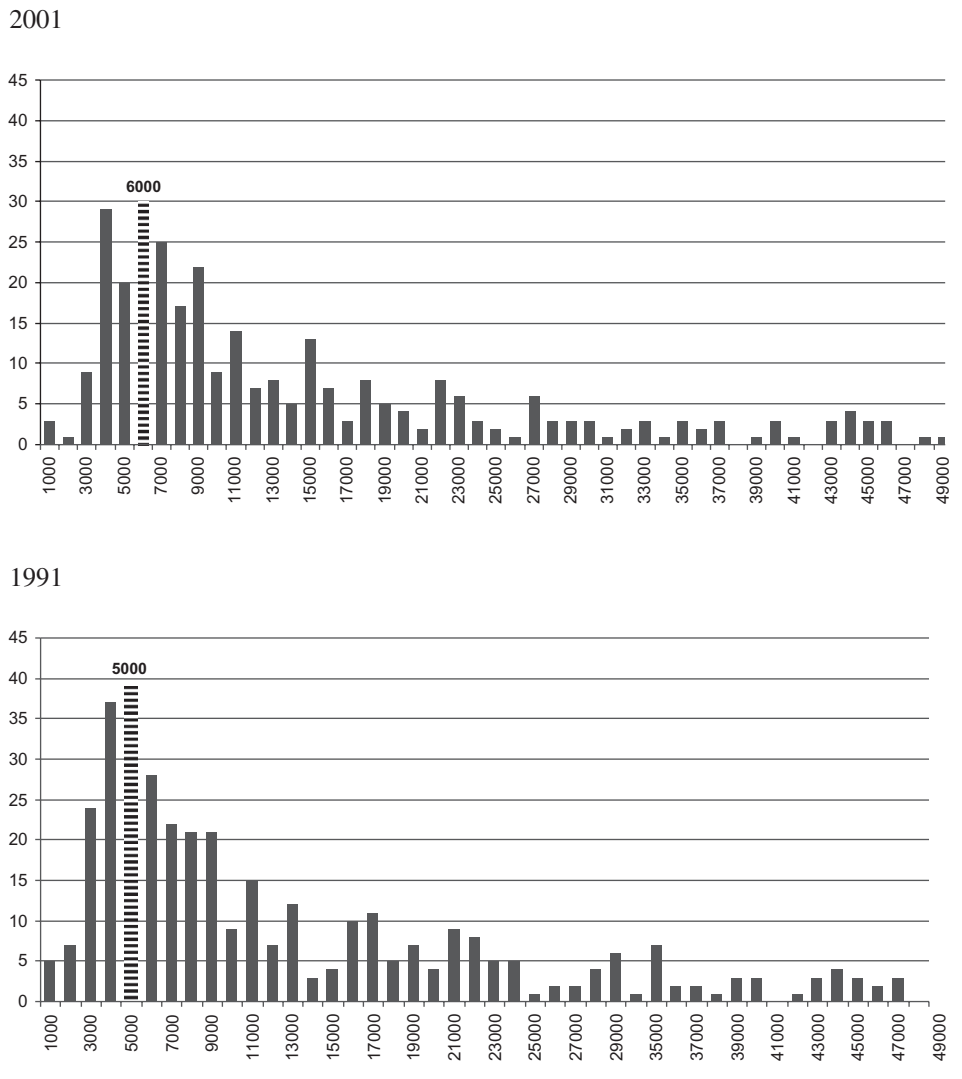

Figure 4. The distribution of PMRs according to population size (2001 and 1991).

During the territorial consolidation, we set a critical minimum threshold for the population and employment size for micro-regions. Using the histogram analysis of PMRs population and job size, we arbitrarily set the critical minimum number at 6000 inhabitants for 2001 and at 5000 for 1991 (Figure 4). We intentionally applied these relatively low thresholds to generate a larger set of PMRs that would reflect the labour systems at the local scale. Our thresholds differed from those applied in previous studies on the regionalization of the Czech Republic by Hampl *et al.* (1987), Hampl and Müller (1996) and Hampl (2005), which arbitrarily set the minimum population size of micro-regions at 15,000 with a minimum of 5000 people living in the hinterland (these criteria were softened for the subregional level, using a combination of 2500 for the hinterland with the total micro-regional size set at 15,000 or a total population size of the region of at least 10,000 with a hinterland of at least 5000 people).

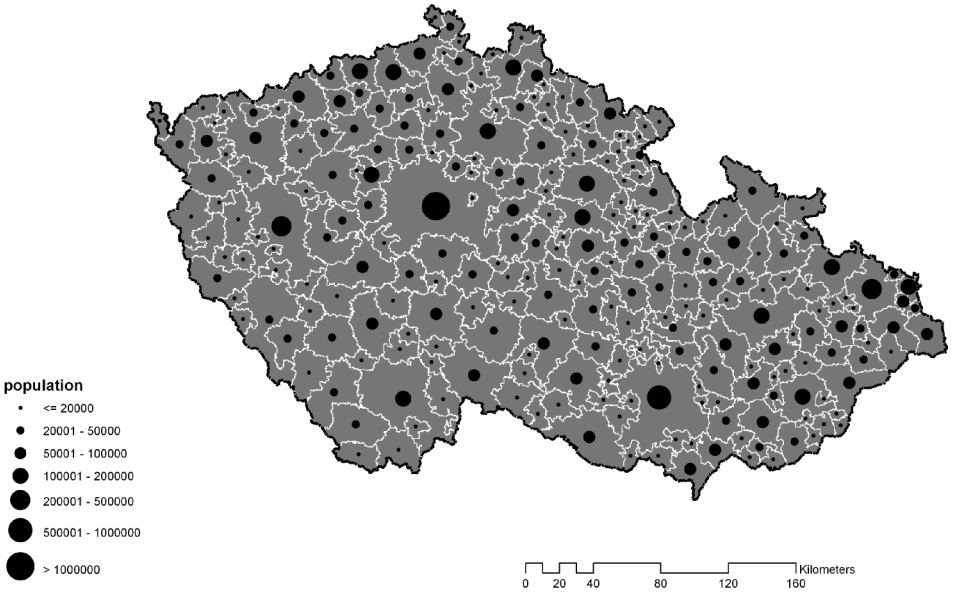

Figure 5. Complex Micro Regions in the Czech Republic (2001).

PMRs with less than the threshold level of 6000 inhabitants for 2001 and 5000 for 1991 were dissolved and spread over other PMRs. When attaching the dissolved PMR municipalities to the larger PMRs, several aspects were taken into account, such as commuting directionality of their original job centre, other significant commuting flows of municipalities, and so on – retaining territorial integrity as the key condition. The consolidation of PMRs into complex micro-regions was, in fact, an iterative process that, in certain cases, included a discretionary decision of the researcher attempting to reflect and respect specific local conditions and contexts. As a result, 260 CMRs were delimited for 2001 (Figure 5) compared with 290 CMRs for 1991. These complex micro-regions cover the whole territory of the Czech Republic.

The analysis confirms the important trend in the development of the country's regional system indicated by previous works (Hampl *et al*. 1987, Hampl 2005). Small and weakly integrated complex micro-regions lose their autonomy and independence and dissolve in regions with stronger centres. The micro-regions that lost their autonomy and were dissolved between 1991 and 2001 were often located in close proximity to major urban centres or close to booming centres. There were also examples of micro-regions in peripheral areas in which the centres were not successful in maintaining a sufficient economic base and labour supply. The decreasing number of complex micro-regions is the result of competition between places for investments and jobs and the subsequent concentration of jobs in a smaller number of larger job centres.

Functional urban areas

The final step was the delimitation of FUAs for the centres of complex micro-regions. FUAs were conceptualized as the areas around job centres with the strongest ties and highest levels of labour market integration represented by the intensity of commuting to work flows. To consider a municipality to be a part of a FUA, we had to set the level or

strength of commuting arbitrarily. The ratio expressed the portion of the employed economically active population commuting to work to the job centre of a CMR in relation to the total of the employed economically active population in the municipality. For the whole sample of Czech FUAs, using data from 2001, we tested several variants considering both daily as well as total commuting to work, and the intensity levels between 15% and 30% of commuters to job centres. We primarily used daily commuting-to-work data; however, we were also interested in whether the total commuting data would change the picture. The level of total commuting was, for instance, checked for municipalities that only marginally failed to fulfil the daily commuting intensity criteria yet were within the continuous areas of a potential FUA. A ratio of at least 25% of the employed economically active population living in the municipality, and commuting daily for work to a job centre of the total employed economically active population living in the municipality, proved to be the best option in the context of the country's urban and regional system.

The results provided good territorial coverage and the highest territorial integrity. While softer ratios of 15% and 20% led to both higher fragmentation of FUA limits and relatively often overlaps between FUAs, a ratio of 30% proved to be quite restrictive. In 2001, 710 municipalities had a ratio of 15% of commuters from employed economically active population to at least two FUA centres and 264 had a ratio of 20% to more than one of the FUA centres. Only 65 municipalities had two or more FUA centres as commuting destinations at a ratio of 25% of commuters of the employed economically active population, and eight municipalities a ratio of 30%. The ratio of 25% allows for a good extent of FUAs in less urbanized areas and spatial continuity without extensive overlaps of FUAs in highly urbanized regions with a polycentric structure of centres.

This of course leads us to the question whether FUAs of respective centres should also include municipalities in other complex micro-regions, and to the question whether some municipalities in border areas can be part of more than one FUA: in other words, can FUAs overlap? Our position is that, from an analytical point of view, there should be no territorial overlaps between FUAs. However, FUAs may form chains and clusters of highly integrated territories. Such territories are then likely to be highly urbanized areas with a well-developed polycentric structure of centres. This issue of the spatial delimitation of FUAs comes back to one of the initial questions: what happens if we employ a top-down approach and select only a limited number of the largest urban centres, then spatially delimit FUAs of these urban centres? A smaller number of centres usually compels us to include larger territories in order to encompass a bigger part of the population in the FUAs. If we later also include smaller job centres, the same criteria would lead to huge territorial overlaps of FUAs. Probably, a more important effect would be that the application of weaker commuting intensity thresholds is likely to lead to the inclusion of peripheral areas in FUAs – that is, places that should be part of complex micro-regions but are not situated within the borders of intensively integrated FUAs. The results of this kind of delimitation can be found, for instance, in the use of the FUR of Tallinn for the study of suburbanization. Delimited with the threshold of 15% of commuting, subsequent analyses of Tallinn's FUR documented its division into an inner circle with intensive suburbanization and an outer peripheral ring with limited housing developments, as well as daily relations to Tallinn (Leetmaa 2008, Leetmaa *et al*. 2009).

Therefore we used a minimum ratio of 25% of the employed economically active population living in the municipality and commuting daily for work to a job centre as a threshold to relate these municipalities to respective job centres and form proto-FUAs. Despite high territorial coherence, such proto-FUAs still did not form fully contiguous areas. Consequently, we applied the principle of territorial coherence in the same manner

as in the case of CMRs. Municipalities that had a ratio of commuting intensity below the threshold but were located inside the proto-FUA area were included in the final FUA. On the other hand, municipalities with a commuting ratio above the threshold, but standing as spatially isolated islands outside proto-FUAs, were not included. Municipalities that reached the threshold for two neighbouring job centres were linked to the job centre with the highest number of commuters in comparison with its competitor. We delimited 260 FUAs for 2001 (Figure 6) and, similarly, 290 FUAs for 1991.

In 2001, FUAs had a concentration of 83% of the national population and 88% of the country's jobs (Table 2). It is important to mention that there were fewer FUAs in 2001 in comparison with 1991. The population of FUAs as a percentage of the country's total population and the economically active population (EAP) in FUAs as a percentage of the

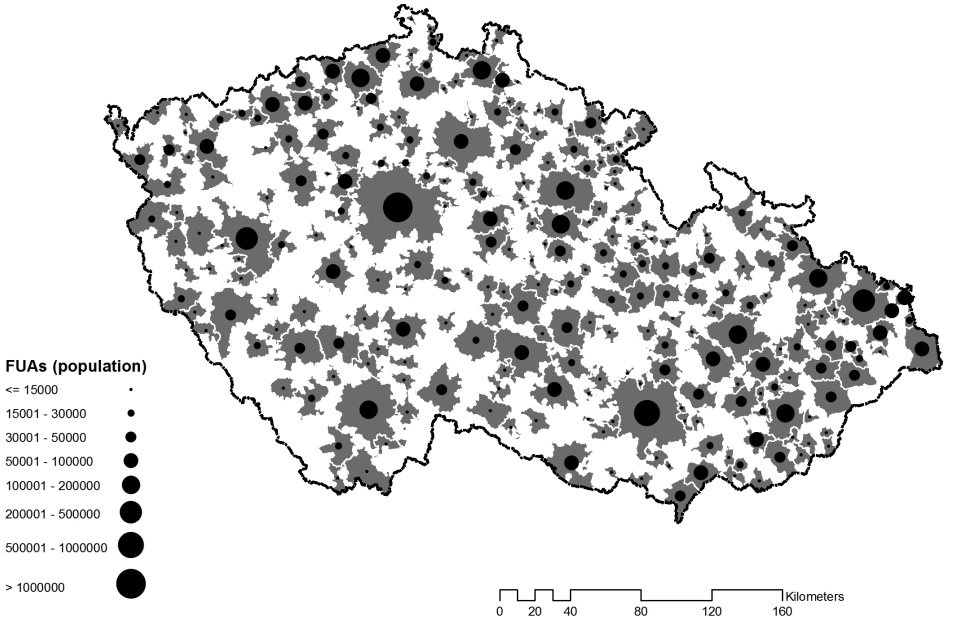

Figure 6. Functional Urban Areas in the Czech Republic (2001).

Table 2. Selected characteristics of FUAs in the Czech Republic (2001 and 1991).

FUA characteristics	2001	1991
Population in FUAs / percentage of the country's total population (%)	8,477,143 / 82.9%	8,630,383 / 83.8%
Economically active population (EAP) in FUAs / percentage of the country's total EAP (%)	4,019,360 / 83.6%	4,569,973 / 86.3%
Jobs in FUAs / percentage of the country's total number of jobs (%)	4,204,770 / 87.5%	4,598,074 / 86.8%
Number of municipalities in FUAs / percentage of the country's total number of municipalities (%)	3,633 / 58.1%	3,386 / 58.7%

Source: Czech Statistical Office 1991, 2001.

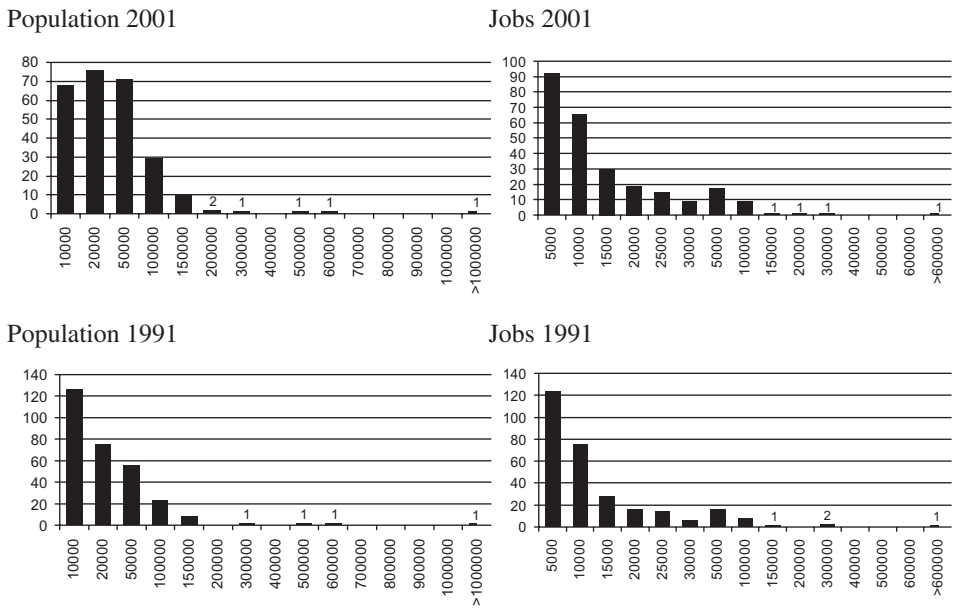

Figure 7. The distribution of FUAs according to population size and number of jobs (2001 and 1991).

Note: axis y shows number of FUAs

country's total EAP declined between 1991 and 2001. Although there were fewer FUAs and job centres in 2001, the FUAs had a larger portion of the country's jobs in 2001 than in 1991. This clearly proves the spatial selectivity of the development of the national urban and regional system, with a concentration of jobs in the main urban centres. The average population size of FUAs increased between 1991 and 2001 due to a suburbanization process. If we compare 1991 with 2001, we had fewer FUAs in 2001; the FUAs had a higher concentration of jobs; their centres were more important in terms of jobs than in 1991; and the FUAs were on average larger in terms of their population (Figure 7).

Summary of results, discussion of relevance for urban and regional policies, and suggestions for further research

We argued that any conceptualization and delimitation of functional regions should reflect and respect their formation on a micro-regional scale and should attempt to detect the smallest complete, complex, organic territorial units where the daily life of the population is integrated. We called these territorial units 'complex micro-regions'. They are often neglected when a top-down approach is applied with *a priori* specified quantitative criteria such as the minimal size of a regional centre or the minimum size of the region itself. The omission of the smallest micro-regions leads to an incomplete and distorted picture of reality and can misguide territorial policies that aim to address and respect competition, cohesion and sustainability principles. In presenting this analysis of the Czech urban and regional system, we documented a major discrepancy between our local approach and the top-down guided representation of functional regions as mainly used in the ESPON 1.1.1 report.

The micro-regional nature of functional regions should be acknowledged in any study of urban and regional systems. The micro-regional foundation is rooted in the dynamics of daily life of the population with its places of home, work, schools, shopping, entertainment, etc. In particular, it reflects the micro-regional nature of integration between labour and housing markets, between places of home and places of work in the daily life of people. People can adjust their daily life routine and repetitive strategies without the necessity of migration within territories that can be effectively reached from their homes. We should not neglect the time–space constraints in daily prisms of people living in our cities and regions (Hägerstrand 1970).

We pointed out two basic views on the spatial organization of settlement and regional systems that are somewhat different, yet mutually tightly related. We can either see the whole country as divided into regions or we can simply focus on the main areas with a high concentration of human activities. In our analysis, we distinguished between functional urban areas (FUAs) and complex micro regions (CMRs). FUAs have a strong integration of urban cores with their immediate hinterland. They cover only the most urbanized and intensively used areas. CMRs are formed through socio-economic links of each settlement to urban cores, containing not only the intensively linked city hinterland but also more remote and loosely related peripheral areas. CMRs completely and exhaustively cover the whole territory. FUAs and CMRs are closely related. FUAs represent urbanized and intensely integrated core areas of CMRs – places where most social activities are spatially integrated on a daily basis. CMRs contain peripheral parts outside FUAs that are more loosely related to urban cores. A FUA is in fact a subset of a CMR, with which it shares a common centre and suburban hinterland but not the peripheral areas. Therefore, in each complex micro-region, we can distinguish three basic zones: core (city), functional urban area (FUA) and periphery (areas outside FUA but within CMR).

This territorial division has great relevance for policymaking. It is within FUAs that the population is usually well served by jobs and services concentrated in urban cores. The population outside FUAs can enjoy the benefits of the city only by longer commuting and hence higher costs. We have to admit that access to the city for the population of the periphery can sometimes be improved through the further development of the transport infrastructure. However, it can hardly be extended to cover all peripheries and integrate them within FUAs. The discussion of possibilities and constraints for the effective extension of FUA boundaries to peripheral spaces will become an important topic of social cohesion and an important issue on territorial justice agendas.

This study of the Czech urban and regional system has demonstrated that the daily life of the population is organized within a much larger number of complex micro-regions and functional urban areas than ESPON 1.1.1 suggests. We delimited 260 FUAs (in 2001), which concentrate 83% of the national population and 88% of the country's jobs. Despite the fact that the country is highly urbanized, a large part of the population (17%) still lives in peripheral places that are only loosely connected to job centres. Czech development is characterized by a continuing concentration of jobs and services. Consequently, the number of urban centres, functional urban areas and relatively complete complex micro-regions is diminishing. Some weak micro-regions can dissolve in highly urbanized areas under the influence of stronger centres and thus remain an integral part of highly urbanized territories, with their population having good opportunities with regard to the choice of jobs and services. There are, however, also peripheral micro-regions with weak centres which under competition from larger development poles lose employers and jobs, and convert to peripheries remote from major urban centres, with only a limited supply of jobs and services to the population. This process of selective territorial development – on the

one hand characterized by a concentration of jobs and people in a smaller number of larger functional urban areas and, on the other hand, by a growing number of peripheral areas with a more than negligible number of inhabitants – will become an important issue for urban and regional studies and a target of territorial policies on national and EU levels.

Important differences exist within the sample of CMRs and FUAs. While most micro-regional centres and their respective FUAs contain human activities that mostly take place on the local level, there are more significant urban centres with their suburban hinterlands that also contain functions and activities of a supra-local level. Such cities and their FUAs are thus not only the cores of micro-regions; they are the nodes of much larger territories. Depending on their size, and especially on the qualitative character of the functions and activities within their territories, they can manage and control regions, states or even supranational formations.

This leads us again to the confrontation of the ESPON 1.1.1 results with the local analysis of the Czech urban and regional system. On the European level, we can focus our attention on the major cities and their FUAs when investigating European growth poles. European policies can also pay attention to the major urban concentrations, which are likely to be the dominant centres of national and EU competitiveness. However, we should not forget that most of the daily life of citizens is still organized within micro-regions, especially their core functional urban areas. It is our main argument that the complex consideration of European territorial development framed with the principles of competitiveness, cohesion and sustainability should involve not only top-down constructed representations of major European growth poles but also consider the bottom-up formation of regions in which the daily life of the population is concentrated. Further research should pay attention to the typology of FUAs, which would reflect the hierarchy of urban centres and their respective FUAs and differentiate between those with local, regional, national and European significance. A complex view of European territorial development has to integrate all scalar levels on which socio-economic life is organized, starting from the micro-regions of daily life to the whole European space.

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TERRITORIAL ARRANGEMENTS OF SMALL AND MEDIUM-SIZED TOWNS FROM A FUNCTIONAL-SPATIAL PERSPECTIVE

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ABSTRACT
This contribution applies a functional-spatial perspective to the study of small and medium-sized towns. A methodology for functional analysis is developed and tested to identify towns, distinguish towns from cities, and detect town positionality within urban territorial arrangements, focusing on whether they are autonomous, networked with other towns or agglomerated with large cities. The methodology is used to compare settlement systems in two regions and two countries in Europe by looking at the existence and nature of networks between towns and cities and how towns perform in terms of population and jobs in respect of their belonging to different types of territorial arrangement.

Key words: small and medium-sized towns, large cities, urban centres, settlement systems, territorial arrangements, functional-spatial analysis

INTRODUCTION

Small and medium-sized towns (SMSTs) are important elements in urban and regional systems, local centres that provide jobs and services to the population, thus acting as vital agents in local and regional development. While many small towns are threatened by a loss of jobs, services and other centrality functions, they can benefit from interurban linkages. Therefore, it is particularly pertinent to know whether and how many SMSTs are part of urban networks as opposed to being self-standing and isolated and whether this impacts on their performance.

Despite recent inquiries shifting the focus from large cities and major urban agglomerations to include second-tier cities (Agnoletti *et al.* 2015; Camagni & Capello 2015; Cardoso & Meijers 2016), insights into the position of SMSTs within urban systems are missing (Servillo *et al.* 2017). We attempt to bridge this knowledge gap by investigating SMSTs and their territorial arrangements. Focusing on settlement systems in their entirety, we attempt to address issues posed by Burger *et al.* (2014a, p. 1921), who urged that 'it remains unclear (1) to what extent urban systems become more polycentric and spatially integrated and (2) whether polycentric, spatially integrated urban systems are more economically efficient than their monocentric and/or non-integrated counterparts'. In particular, we investigate which SMSTs form part of polycentric city networks, which are agglomerated within hierarchically organised metropolitan regions, and which remain self-standing and rather isolated urban centres, Furthermore, we ask how these

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various locations affect their development and performance.

In this paper we first focus on the conceptualisation and identification of SMSTs and their territorial arrangements. Employing a functional-spatial perspective, we develop methods to identify SMSTs and their territorial arrangements and apply them in an analysis of settlement systems in selected countries and regions: Catalonia, Czechia, Central France and Slovenia. Finally, we provide initial insights into the performance of SMSTs in terms of population and jobs according to their membership in different types of territorial arrangements.

TOWNS' TERRITORIAL ARRANGEMENTS

Towns evolve via their relationships with other towns and cities; together, they form urban and regional systems (Berry 1964). As Rondinelli (1983, p. 385) suggests, 'the value of small urban centers is not so much in their ... sizes as in their functional characteristics'. We can productively think about towns 'in terms of influence and reach, rather than population size, density or growth' (Bell & Jayne 2009, p. 689). The functions and performance of SMSTs depend on their relations with other towns and cities (Meijers & Burger 2017). Thus towns should be studied in relation to the territorial system in which they are embedded (Andersen *et al.* 2011), focusing on 'the ways in which small cities link with other cities (and non-urban places) and the forms that these linkages take' (Bell & Jayne 2009, p. 689).

The city network theories claim that cities can benefit from synergies in complementary, reciprocal and co-operative activities and relationships (Batten 1995; Capello 2000). Consequently, polycentric urban systems have been associated with favourable conditions for economic performance. The concept suggests that some cities may perform better than others provided they can benefit from agglomeration economies developed and shared among geographically proximate cities. Meijers and Burger (2010) refer to polycentric urban regions by emphasising that external economies may not be confined to a single urban core but rather shared among a collection of close-by and linked cities. In polycentric urban regions, physical proximity is likely to be utilised by functional linkages that reflect the 'possibilities for the 'borrowing' of certain skills and expertise from nearby urban areas' (Phelps 2013, p. 160). However, empirical studies have not yet provided a clear answer to the question of whether polycentric and networked urban regions perform better than monocentric and hierarchically organised (Burger *et al.* 2014c; Brezzi & Veneri 2015).

While most studies of polycentric urban systems and regions focus on major cities, less is known about whether and how SMSTs can benefit from networking with other towns and cities. Of particular relevance is the recently reinvented concept of 'borrowed size' (Burger *et al.* 2015; Meijers *et al.* 2016; Meijers & Burger 2017), originally outlined by Alonso (1973). Meijers and Burger (2017) neatly summarise the key premises of the concept, which refers to a situation in which smaller towns located within larger metropolitan areas perform more favourably due to the agglomeration benefits gained from their geographical proximity and functional interconnectedness with larger cities. Recent analyses of the effect of borrowed size have investigated the presence of higher-order metropolitan functions (Meijers *et al.* 2016; Meijers & Burger 2017) and high-end cultural amenities (Burger *et al.* 2015), stretching the concept of borrowing to include large cities (Meijers & Burger 2017). However, small towns and their functions and performance in relation to local labour markets and the provision of local services remain unexplored.

There are several types of territorial arrangement between small, medium-sized and large cities. First, there are smaller towns in metropolitan areas which may gain agglomeration benefits from large cities while avoiding their costs. However, fierce competition may also mean they find themselves in an 'agglomeration shadow' (Burger *et al.* 2015), which may lead to a decline in centrality functions and consequent transformation to predominantly residential areas dependent on the large city. Burger *et al.*

(2015) and Meijers and Burger (2017) found that in terms of metropolitan functions and high-end cultural amenities, larger cities are better able to borrow size than smaller cities. However, these analyses have not explored the way in which the proximity and interaction with larger cities affects the ability of small towns to retain their local functions and perform better than isolated towns.

Another option is a network of small and medium-sized towns. Here the key issue is whether such a network of SMSTs can be a substitute for the agglomeration economies of large cities (Phelps *et al.* 2001; Johansson & Quigley 2004). This hypothesis was tested for US metropolitan statistical areas (MSAs) by Meijers and Burger (2010, p. 1383), who pessimistically found that 'a network of geographically proximate smaller cities cannot provide a substitute for the urbanisation externalities of a single large city'. However, it should be noted that the analysis involved only areas with a total population of over 250,000 inhabitants, leaving many SMST networks unexplored.

Finally, peripheral, less urbanised regions, distant from major metropolises are often characterised by the presence of autonomous towns. Although towns in these regions are usually smaller in terms of populations and jobs, they often play a significant role as key nodes within extensive rural and peripheral territories. These towns cannot directly borrow benefits from nearby cities or towns; however, they are also not threatened by the competition, and they retain a somewhat provincial yet stable role as local urban centres.

Therefore, we suggest that it is worth distinguishing between the different territorial arrangements of small and medium-sized towns and testing their effect on the town's performance. We suggest that there are three basic types of SMST positions within territorial arrangements:

1. autonomous (isolated, self-standing) SMSTs (usually located in peripheral rural regions);
2. agglomerated SMSTs that are integral parts of polynucleated metropolitan areas and conurbations dominated by large cities and major metropolises; and
3. polycentric networks of several SMSTs (usually located in modestly urbanised regions outside major urban agglomerations).

A FUNCTIONAL SPATIAL PERSPECTIVE AND METHODOLOGY

Aiming to distinguish territorial arrangements of SMSTs, we first need to identify the settlements that we consider to have the status of town or city. We argue that the key characteristic of towns and cities is their role as urban centres within regional systems. This role is expressed not only through the concentration of centrality functions, such as jobs, services or amenities, but especially through their linkages with other settlements. Towns and cities that act as urban centres do so within and for urban regions. The most common form of an urban region is one that has a single node – the core town or city – surrounded by a rural hinterland (Paar 2014). In large urbanised areas, where urban nodes form strongly interconnected networks, the single-node urban regions can develop into polycentric metropolitan areas (Soja 2000). Andersen *et al.* (2011, p. 595) thus note that traditional urban analyses that concentrate on individual urban places and on an urban/rural dichotomy encounter serious limitations when used to investigate highly urbanised territories such as Denmark, where 'the functional areas of many large cities have merged to form continuous urban landscapes'. However, analyses of the Belgian urban system (Hanssens *et al.* 2014) and Randstad (van Oort *et al.* 2010) have shown that neither the Christallerean hierarchy nor the concept of an urban network (Capello 2000) or a polycentric urban region (Kloosterman & Musterd 2001) are capable of fully capturing the nature of an urban system that combines features of both an urban hierarchy and a polycentric network. Hence, as Paar (2014, p. 1929) suggests, polycentric urban regions (PUR) 'might be better viewed as a series of city-regions, each based on a major centre of the supposed PUR' (see also Burger *et al.* 2014a).

Despite these findings calling for a more nuanced view of urban regions, they do not challenge the primary emphasis in current urban study debates on the role of urban regions as the most essential functional territorial unit of urban and regional systems (Scott 2001; OECD 2002; Antikainen 2005). While analyses of urban regions have up to now predominantly focused on large cities, metropolitan areas, conurbations or megacity regions (Hall 2009; Healey 2009; Lang & Knox 2009; Turok 2009), we have argued elsewhere that such an approach omits the very existence of urban regions of small and medium-sized towns (Sýkora & Mulíček 2009), which act as the micro-level territorial systems within which the daily activities of the population occur (Hägerstrand 1987). Summing up, from the functional-spatial perspective cities and towns qualitatively differ from settlements that do not possess centrality functions, do not act as centres and do not form their own urban regions.

Second, urban centres are highly differentiated according to the strength and significance of their centrality functions and hence their territorial influence. We can distinguish between large metropolises, medium cities and small towns according to the particular degree of centrality that ranks or positions these cities and towns within urban hierarchies (Christaller 1933; Lösch 1941; Berry 1973; Haggett *et al.* 1977). Therefore, we employ functional-spatial perspective to differentiate between lower rank urban centres (which we interpret as being small and medium-sized towns) and upper rank urban centres (interpreted as being large cities).

Finally, we aim to classify the positionality of urban centres within settlement systems and identify their territorial arrangements: autonomous towns, towns agglomerated with large cities and towns networked with other small and medium-sized towns. We use Czechia as our example and document the individual steps in the methodology and then provide the empirical outcomes as illustration. Figure 1 presents an overview of the essential analytical steps in the functional analysis and these are discussed in detail in the next two sections.

In the analysis, we use two types of data: information on the size of each settlement and data about relations between settlements. In relation to the size of a settlement, we use the number of jobs and population size, as these data are readily available for international comparisons. We also assume that jobs are essential for the development of other functions; thus, although jobs and population do not provide the complete picture, they can present an initial perspective and broad view of settlement systems.

As the number of jobs and size of resident population do not provide a sufficient picture of a settlement's functionality in the urban and regional systems, we also analyse functional relations between settlements. These relations could involve transportation and telecommunication, commuting to work and schools, shopping and leisure trips, flows of information and goods, etc. For the purposes of this research, we chose commuting to work. We are aware that by taking a single type of relation, we abstract from the multiplexity of functional linkages (Burger *et al.* 2014b). However, the focus is on small and medium-sized cities and their territorial constellations, and commuting-to-work represents the most frequent, intensive and important relation in the daily life of the population and the operation of local microregions. Furthermore, we assume that other types of trips and relations are related to job commuting. Finally, the data on commuting are usually available in the required spatial detail for national and regional territories. Therefore, we use commuting flows from places of residence to places of work in the form of a matrix of the total travel-to-work flows between all settlements within the region under study (the data should, however, also include the flows across regional borders, especially in studies at the subnational level where the regions are not perfectly self-contained travel-to-work areas).

In the functional analysis, we use the smallest settlements and data for the established territorial-statistical units. In most countries, these units are LAU2 – usually municipalities that contain central settlements that could be a city, town or village and often also include other small settlements in their

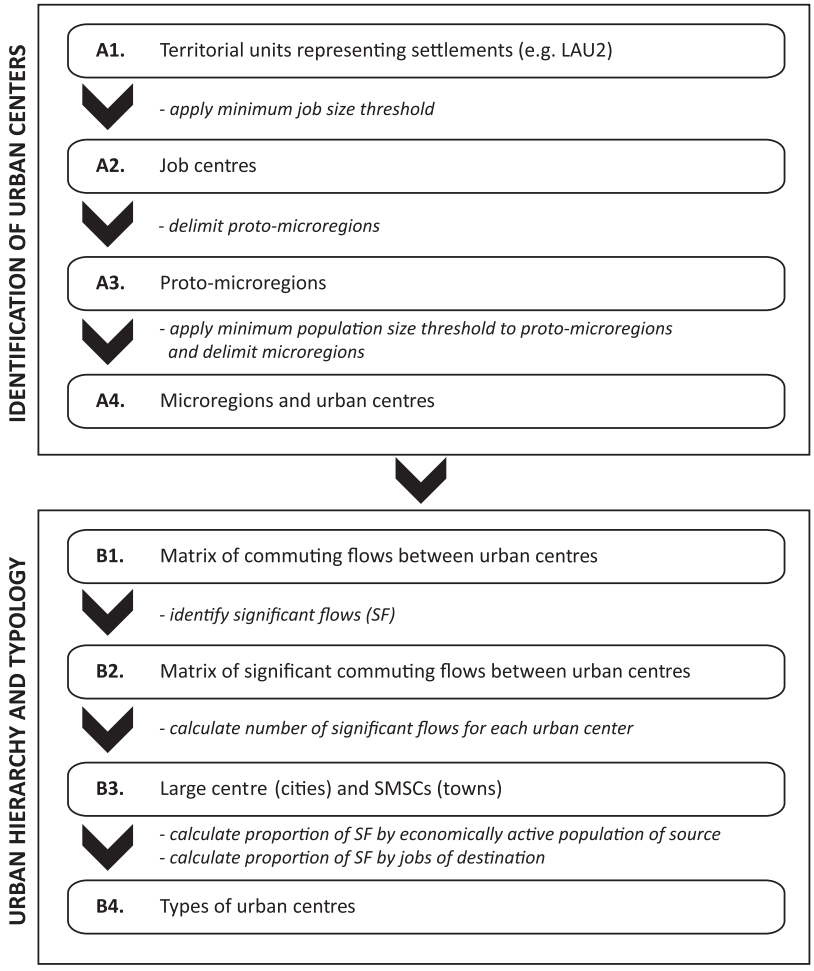

Figure 1. *Functional analysis diagram - overview of analytical steps.*

immediate vicinity. In the case of urban municipalities, we assume that the vast majority of the population and centrality functions, such as jobs and services, are located within the central settlement. In countries, where the real organic urban areas consist of several municipalities, such as in France, urban LAU2 should be amalgamated.

IDENTIFICATION OF URBAN CENTRES

The first task is to distinguish between settlements that act as urban centres and those that do not. Our first assumption is that towns and cities act as urban centres if they concentrate functions that result in the formation of an urban region. As our data-sources are limited to employment and commuting data, we determine which settlements can be considered to be job centres and which are strong enough to form their own travel-to-work region.

In the first step of the functional analysis, we identify job centres as settlements that provide enough jobs to make them an important commuting destination. First, we create a set of settlements (LAU2) with a number of jobs above a minimum threshold size set discretionarily. Second, we select settlements that are the commuting destinations of the strongest outgoing flow from at

least one other municipality. Third, we intersect the two datasets to determine the job centres. There are two methodological issues to resolve. First, what is the typical threshold number of jobs needed for a settlement to become a job centre, that is, to attract significant streams of commuters? We recommend using the frequency distribution of municipalities targeted by major commuter flows by number of jobs. In Czechia, this resulted in a threshold of 1,000 jobs being selected (this may vary by country according to the national context). Consequently, we defined a job centre as being a municipality with at least 1,000 jobs that is also the main commuter destination from at least one other municipality. In Czechia in 2001, 493 of the 6,258 Czech municipalities fulfilled the criterion of having a minimum of 1,000 jobs; at the same time, 645 municipalities were classified as destinations for maximal commuting flows from other municipalities. The intersection of these two datasets resulted in a set of 367 job centres with 1,000 or more jobs that were also the major commuter destinations for at least one other municipality. These job centres include small and medium-sized towns as well as large cities.

Our other assumption is that the settlement operates as an urban centre if it forms its own microregion. Not every job centre is strong enough to attract commuters from several surrounding settlements and to form a travel-to-work microregion. The functional analysis thus continues with the delimitation of microregions, that is, territories that are related to a particular urban centre through functional ties (in our case commuting ones). Using the matrix of all the commuting flows between settlements, we link each source settlement to just one destination settlement following the direction of the strongest commuting flow. In most cases, the destinations are the previously identified job centres. If the strongest flow from a source settlement is directed to another settlement that is not one of the identified job centres, the source settlement is linked to a job centre indirectly via an intermediate settlement (for details, see Sýkora & Mulíček 2009). Using this approach, each settlement is assigned to a job centre and this determines the proto-microregions (PMRs).

Proto-microregions should be treated as preliminary representations of microregional patterns. Proto-microregions may consist of just a job centre and one or two other municipalities. While in some instances these relatively small PMRs may emerge around a larger job centre, usually in the context of a larger urban agglomeration facing competition from large centres, there may be cases where the job centre and its region are not strong enough to provide a sufficient supply of jobs and services within the region. Therefore, it is advisable to apply the population size threshold in order to eliminate very small PMRs and dissolve their LAU2 into neighbouring job centres. Analysing the frequency distribution of a number of PMRs in population size categories in Czechia, we found a threshold size of 6,000 inhabitants (Sýkora & Mulíček 2009). Since the territories of PMRs are usually spatially fragmented, they will be consolidated into contiguous areas. Consequently, we obtain a set of territorially coherent microregions, and each microregion is organised around a microregional centre (MRC). In Czechia, the outcome for use in consecutive parts of the functional analysis was a set of 260 microregional urban centres that represent the towns and cities.

Although the functional analysis employs the concept of urban region, the primary goal is not to identify self-contained functional regions, travel-to-work or local labour market areas (cf. Van der Laan & Schalke 2001; Coombes *et al.* 2005; Karlsson & Olsson 2006; Robson *et al.* 2006). Our key aim is to determine which settlements act as urban centres. They may do so in various regional situations ranging from highly self-contained regions to areas that are strongly interconnected through a multiplicity of ties with other urban centres and that exhibit lower levels of self-containment. This latter situation is common in exposed locations within highly urbanised territories. The fact that there are higher levels of networking and lower levels of self-containment should not inhibit us from detecting micro-territorial levels within which urban centres act as regional

nodes. Therefore, in our analysis, we abstract from the self-containment because it would be biased in favour of larger interconnected areas of major urban centres and regions with highly networked urban centres, while hiding the microregional structures of small, well-connected towns. The linkages between urban centres, the interconnectedness of their regions and high-rank regional associations are reflected in the detection of a polycentric constellation of urban nodes, which we focus on in the next section.

URBAN HIERARCHY AND TERRITORIAL ARRANGEMENTS OF TOWNS

The size, centrality and position of microregional urban centres differ within the urban system. These centres include small and medium-sized towns as well as large cities. Usually population size is used to distinguish between these categories, commonly using a threshold of 50,000 inhabitants. However, given that we are adopting a functional-spatial perspective, we are interested in the territorial influence and role of towns and cities in urban and regional systems. Large cities concentrate functions provided to the population and firms in their own microregion and also to those in other microregions.

In this step of the functional analysis, we consider and analyse relations between urban centres. Combining the significant commuting flows between microregional centres with the number of jobs, we distinguish between the lower and upper tiers of the urban hierarchy, i.e., between small and medium-sized towns and large cities. Furthermore, we assess the positionality of SMSTs within the territorial arrangements of towns and cities. We begin with the matrix of commuting flows between microregional urban centres. Inspired by Van Nuffel (2007) we select only the significant commuting flows.[1] We detected 415 significant flows between microregional urban centres in Czechia.

However, some significant flows are relatively small in terms of the number of commuters and are insignificant in terms of their impact on local labour markets. We argue that significant commuting flows have to be important in relation to the economically active population of the source urban centre and/or in relation to the number of jobs in the destination urban centre. Hence, we determine what proportion of the significant flow of the economically active population of the source centre drains a significant proportion of the economically active population from the local labour market to another urban centre. Based on an analysis of the Czech system, we decided to eliminate flows that account for less than 5 per cent and retain those representing 5 per cent or more of economically active residents; thus we selected 205 flows that are significant for the centre of their origin.

Next, we detected flows important for the job market in the destination centre. Acknowledging that there is no clear dividing line, for Czechia, we have arbitrarily set a threshold of a one per cent share of incoming commuters flow as a proportion of total jobs in the destination centre. In other national urban systems, thresholds may be set differently. In Czechia we identified 116 flows that play a significant role in the job market in the destination centre, while the remaining 89 flows are significant only for the centre of their origin.

On the basis of the existence and character of flows between microregional centres, we distinguished several types of linkages with other urban centres. First, centres that have no significant outgoing or incoming flows are autonomous. Second, microregional urban centres that are only destinations for significant commuting flows clearly show a higher rank within the urban hierarchy. Finally, many microregional centres exhibit both outgoing as well as incoming flows. If an urban centre is linked to another centre by an outgoing flow that is significant only to its own labour market, then an agglomerative relation exists. If the commuting flow is important for both the source centre and the destination centre, then a networking relation exists. There are also instances of perfectly networked pairs of towns with mutually reciprocal significant flows that are important for both centres.

Then we distinguished between microregional urban centres that are centres of

lower rank (small and medium-sized towns) and centres with higher rank in urban hierarchies and networks (large cities). Urban centres that are destinations of flows from other urban centres can be considered to be urban centres of higher functional rank. Using the matrix of significant commuting flows between microregional centres, we identified the number of incoming flows for each urban centre. Where urban centres had more than one outgoing significant flow, we added only the respective proportion (0.5; 0.33; 0.25; 0.2) of the outgoing flows to destination centres. We found that the functional position of urban centres with over 50,000 in Czechia have a value of 2.5 or greater. Hence, we detected that urban centres with populations over 50,000 and a position in the urban system of 2.5 or higher are large cities. However, there is no straightforward relationship between city size and function in the urban system. Two urban centres with high functional positions had populations of less than 50,000 and one centre with a population of nearly 100,000 exhibited a lower number of significant incoming flows. These cases were individually assessed in relation to the spatial and historical context.[2] Finally, we identified 14 large cities out of 260 microregional centres in Czechia.

Combining the rank of urban centre with the existence and direction of important commuting flows and their role in relation to source and destination urban centres, we identified several types of urban centres according to their position within the urban system: (A) large urban centres (cities) (LC); (B) autonomous urban centres with no significant outgoing or incoming flows (AUTO); (Ca) agglomerated urban centres with outgoing flows that are only significant locally (a significant share of the economically active population of the source centre) and are linked to a large centre (LC) – they are agglomerated with a large centre (AGLO-LC); (Cb) agglomerated urban centres with outgoing flows that are only significant locally (a significant share of the economically active population of the source centre) and are linked to another town – they are agglomerated with small and medium-sized centres (AGLO-SMST); (Da) networked urban centres with outgoing flows that are also significant for the destination centre (with a significant share of its jobs) and are linked to a large centre (LC) – they are networked with a large centre (NETW-LC); (Db) networked urban centres with outgoing flows that are also significant for the destination centre (with a significant share of its jobs) and are linked to this destination town – they are networked with other small and medium-sized centres as source SMSTs (NETW-SMST-S); (Dc) networked urban centres with significant incoming flow(s) from other SMSTs – they are networked with small and medium-sized centres as destination SMSCs (NETW-SMST-D).

Urban centres with two or more distinct outgoing flows to multiple destinations were sorted according to the strongest flow. For urban centres that are both the destination and source of commuting flows, we compared the strength (the sum) of the incoming versus outgoing flows to classify the urban centre.

By plotting the results of the functional analysis of Czechia on a map (Figure 2), we can see the functional types of urban centres (large cities and autonomous, agglomerated and networked small and medium-sized towns), their significant relations and type of territorial arrangement. First, there are significant urban systems organised around large centres (cities) in which the SMSCs are usually agglomerated with the large city. These systems are characterised by a hierarchical dominance of large cities developed around five out of 14 large Czech centres (Prague, Brno, Pilsen, České Budějovice and Hradec Králové). A second type is an urban system organised around a large city with networked small and medium-sized centres nearby, that is, commuting flows are significant not only for the source towns but also for the large centre, which usually contains agglomerated towns (Jihlava, Karlovy Vary, Liberec, Mladá Boleslav, Olomouc, Ostrava, Pardubice and Zlín). The third type is an autonomous large city (Ústí nad Labem). The other types include urban systems consisting solely of small and medium-sized centres (towns). The most typical arrangement is that of two towns followed by a triad

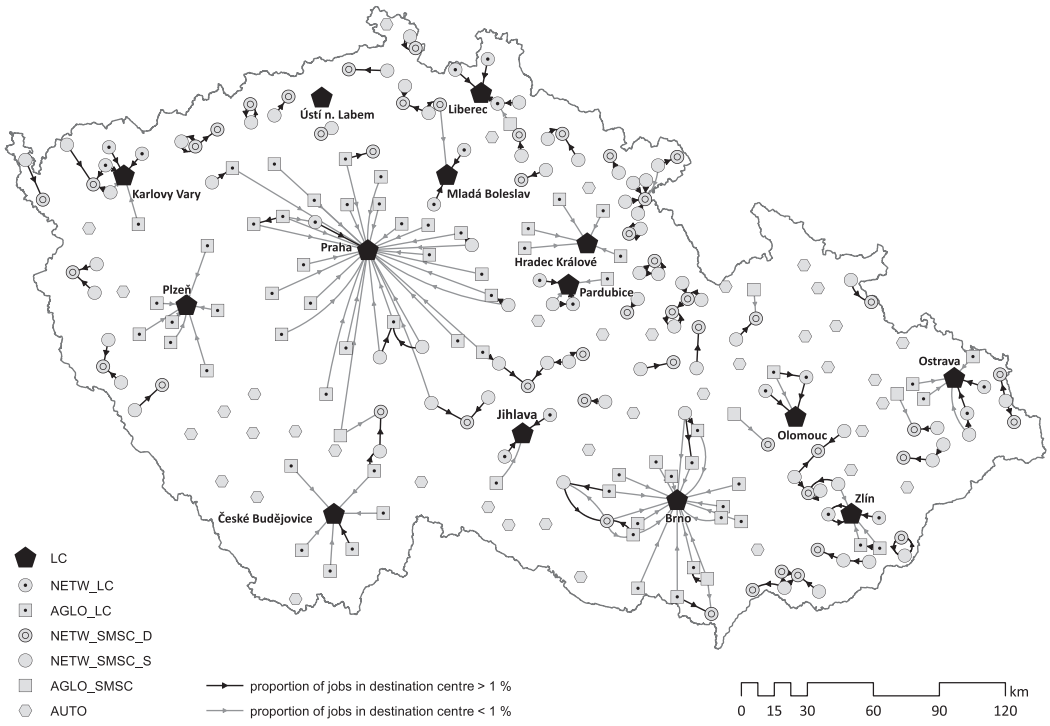

Figure 2. *Types of urban centre according to positionality within territorial arrangement (autonomous, networked, and agglomerated).*

consisting of a destination urban centre linked to two other towns. There are also more complex constellations of several small and medium-sized towns, where most have the status of a destination urban centre. These polycentric complexes of SMSCs can be found in eastern Bohemia and central Moravia. Finally, autonomous SMSCs are most common in peripheral rural areas, particularly in the southern part of the country and in the highland region of Jeseníky in the country's north east.

URBAN CENTRES: TERRITORIAL ARRANGEMENT AND PERFORMANCE

This section presents the results for four of the ten regions and countries (Catalonia, Czechia, Central France, and Slovenia) analysed within the framework of the ESPON TOWN project (Servillo 2014; Sýkora & Mulíček 2014).[3] The basic territorial unit used in the functional analyses was the municipality (LAU 2), with the exception of France, where *unités urbaines* (aggregations of municipalities) were used instead. These units differ substantially between countries in terms of their spatial extent and population size. While the average population size of the units in Central France and Slovenia exceeds 10,000 inhabitants; in Catalonia it is 7,000 and in Czechia below 2,000. A threshold of 1,000 jobs was used to identify job centres in all the regions with the exception of Slovenia where all the significant (not only maximal) commuting flows were used to identify job centres. The population threshold value for the delimitation of microregions varied from 5,000 in Catalonia to 10,000 in Central France and Slovenia. In the case of the Central France region, the complementary threshold of minimal job size (4,000) was added. Table 1 shows the resulting number and average population size of the microregions and their centres. There is a major distinction between smaller travel-to-work areas in the former socialist countries and the

Table 1. *Microregional centres (MRC).*

Region	total population	Number of municipalities (LAU2) or alternative units	number of microregions (MR)/ microregional centres (MRC)	MRC % from all units in region	average population size of MR	average population size of MR centre total/for SMSC without LC
Catalonia, Spain (ES51)	6,343,110	946	66	6.98%	96,107[a]	48,827/22,878
Central France region (FR24)	1,565,920	116	19	16.38%	104,395	62,673/24,292
Czechia (CZ0)	10,230,060	6,258	260	4.15%	39,346[b]	24,193/14,030
Slovenia (SI0)	1,994,026	192	51	26.56%	39,099	26,348/18,265

Notes: *Unités urbaines* were the analytical units used for France. [a]46,192 without Barcelona. [b] 33,961 without Prague.

Table 2. *Number and percentage of large cities and towns according to territorial arrangement.*

Region	LC	NETW-LC	AGLO-LC	NETW-SMSC-D	NETW-SMSC-S	AGLO-SMSC	AUTO
Catalonia, Spain (ES51)	4/6%	10/15%	19/29%	10/15%	14/21%	0/0%	9/14%
Central France (FR24)	5/26%	3/16%	8/42%	1/5%	2/11%	0/0%	0/0%
Czechia (CZ0)	14/5%	19/7%	66/26%	49/19%	67/26%	6/2%	39/15%
Slovenia (SI0)	4/8%	10/20%	9/17%	11/22%	16/31%	1/2%	0/0%

Table 3. *Proportion of the population in large cities, towns in particular types of territorial arrangement and non-centres (% of the total population of the region).*

Region	LC	NETW-LC	AGLO-LC	NETW-SMSC-D	NETW-SMSC-S	AGLO-SMSC	AUTO	Non-centres
Catalonia, Spain (ES51)	28.44	6.03	10.31	2.71	2.04	0.00	1.28	49.20
Central France (FR24)	54.33	6.48	9.26	4.09	1.89	0.00	0.00	23.96
Czechia (CZ0)	27.75	4.16	6.84	10.89	6.74	0.28	4.83	38.51
Slovenia (SI0)	24.34	9.89	6.33	14.76	11.93	0.14	0.00	32.61

larger regions in Central France and Catalonia with a larger commuting distance.

Having obtained a set of microregional centres, functional analysis was then used to distinguish small and medium-sized towns from large cities and identify the territorial arrangements of towns, that is, whether they are autonomous, networked or agglomerated (see Tables 2 and 3 and Figures 3–6 for an overview). The analysis of the territorial arrangements revealed substantial differences between urban systems. In Central France, half of the population is concentrated in large centres; small and medium-sized centres account for only 22 per cent of the total, while the rest live outside the urban centres. In Czechia and Slovenia the population is evenly distributed between large centres (cities), small and medium-sized centres (towns) and non-centres. In Catalonia, nearly half the population lives outside the urban centres, while the remainder of

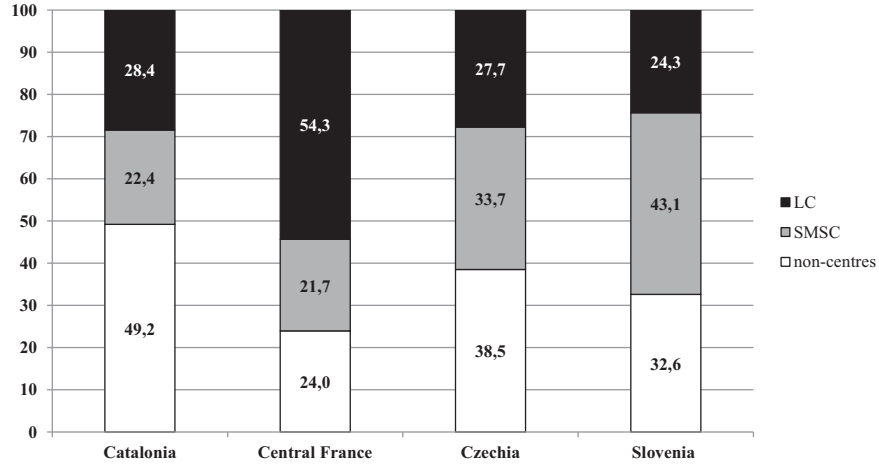

Figure 3. *Proportion of the population in microregional urban centres (large cities and small and medium-sized towns) and non-centres (%).*

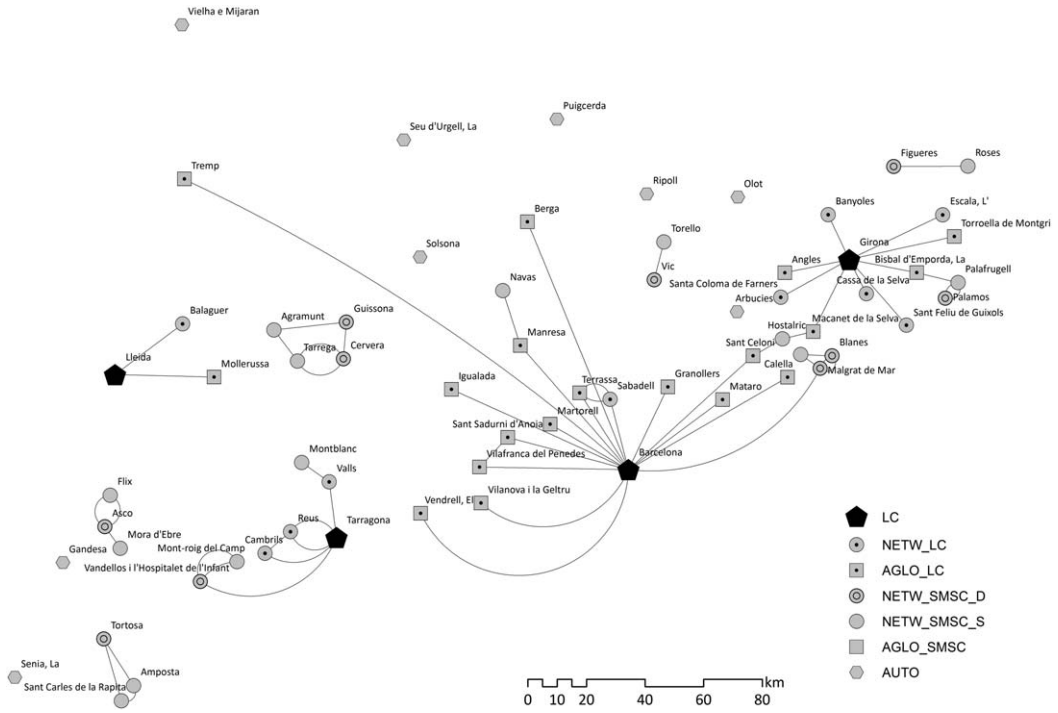

Figure 4. *Catalonia: overview of territorial arrangements of type of urban centre.*

the population is skewed toward large centres.

Not surprisingly, the urban systems are dominated by large centres (cities). In addition to having a large share of the total population, their key role in the settlement systems is documented by the fact that small and medium-sized centres (SMSCs) agglomerated with large centres (AGLO-LC) or SMSCs networked to large centres (NETW-LC) are the most frequent type of a town's territorial arrangement. Towns agglomerated with large cities (AGLO-LC) are typical in Catalonia (Spain) and Central France. The large number and share of SMSCs in Slovenia reveals strong functional ties with large centres; however, their relations are more reciprocal and less hierarchical, accounting for the networks with large centres (NETW-LC type). Towns are also frequently agglomerated to large cities in Czechia. However, the Czech urban system is mainly based on dense networks of towns, which is demonstrated by the dominance of networked territorial arrangements between SMSCs. Networked towns are also significant in Catalonia and Slovenia. Autonomous towns are common in Czechia and Catalonia. There are no autonomous SMSCs in Central France due to the highly urbanised landscape. Towns of this type were not identified in Slovenia either, which can be explained by the polycentric pattern at the national level with the agglomeration of SMSCs (towns) to large centres (cities) and the polycentric arrangement of towns at the local level.

As we anticipated that the position of the SMSTs within the urban system may impact on their performance, we analysed the population and jobs growth or decline between 2001 and 2011 (2009 in France, data for Catalonia were not available). Figure 7 compares the respective categories of the functional position of towns in Central France, Czechia, and Slovenia. It clearly indicates the exclusive position and performance of large centres when compared with small and medium-sized centres. The most pronounced difference was observed in Czechia, where the number of jobs in Czech small and medium-sized centres

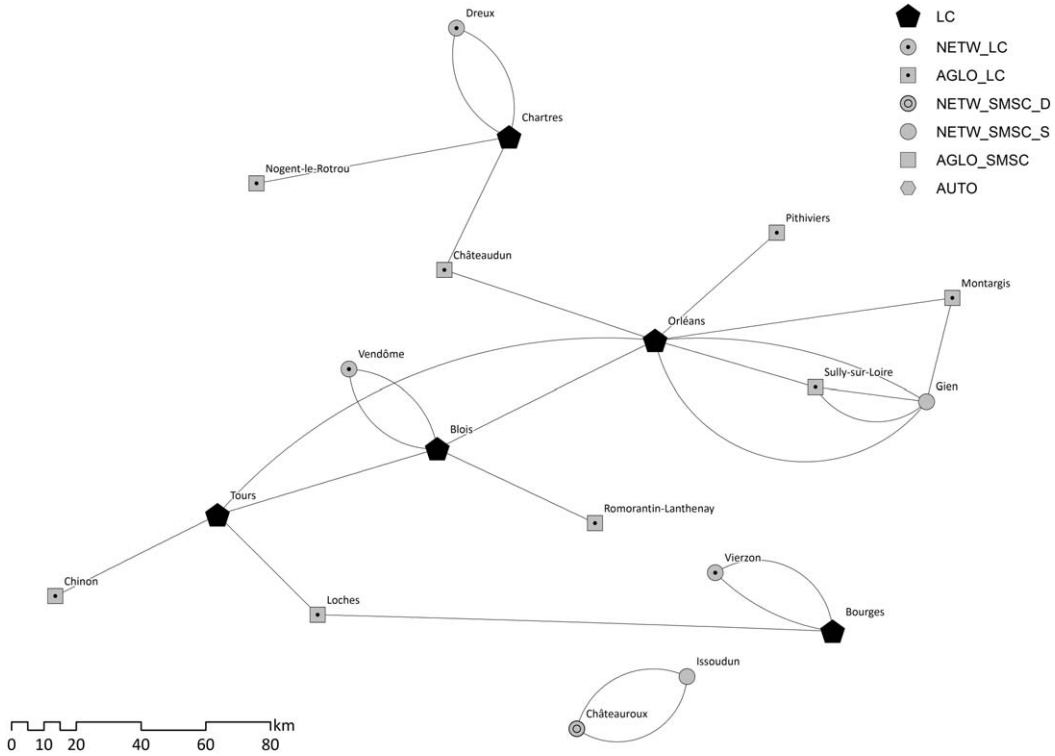

Figure 5. *Central France: overview of territorial arrangement of type of urban centre.*

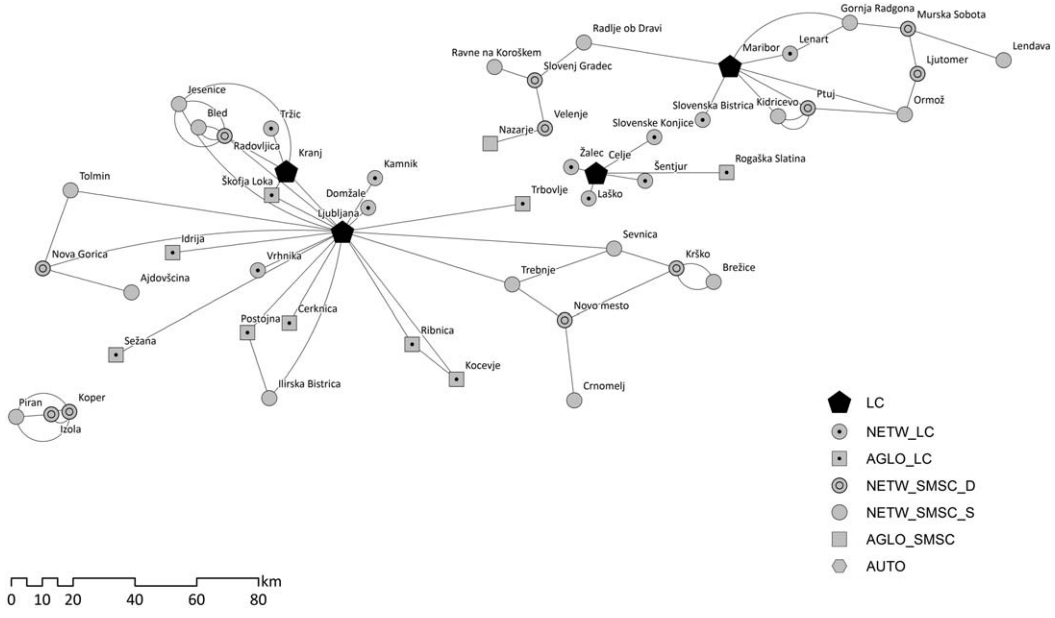

Figure 6. *Slovenia: overview of territorial arrangement of type of urban centre.*

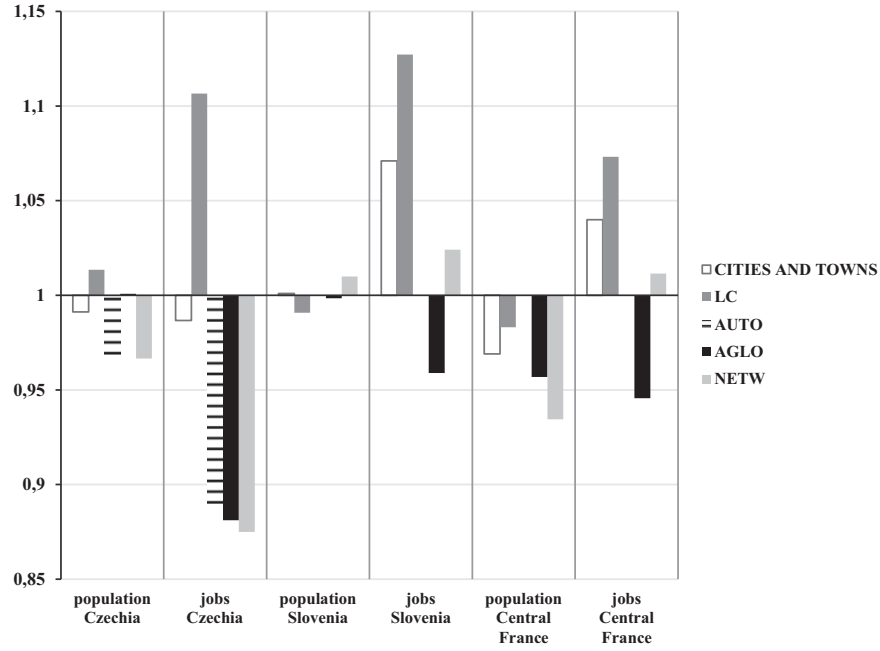

Figure 7. *Population and job performance in Central France, Czechia and Slovenia.*

declined by 12 per cent, while jobs in large centres increased by 11 per cent. A similar change was observed in Slovenia with 13 per cent job growth in large centres, 2 per cent job growth in networked towns, and a 4 per cent job decline in agglomerated towns, which can be explained by the competition from large cities and transformation of agglomerated towns from places of production and services into more residential suburban nodes. A similar development was recorded in Central France, with 7 per cent job growth in large centres, 1 per cent job growth in networked towns and a 5 per cent decline in jobs in agglomerated towns. While the changes in job distribution were quite significant, the distribution of the resident population reminded stable. A minor trend, however, could be observed in the stronger population decline among networked towns compared to agglomerated towns in Czechia and Central France.

As the growth trends have not shown any major differences between the territorial arrangements of different types of towns, we have also individually assessed subgroups of SMSCs agglomerated to or networked with large centres and/or small and medium-sized centres. However, there were no significant differences between these more detailed functional categories of SMSCs. There is a great variability in the population and job performance of individual urban centres (Sýkora & Mulíček 2014) suggesting effects of plurality of diverse contextual factors. A multivariate analysis could identify the key structural conditions affecting the performance of towns and cities, of which their position within urban systems is just one. However, this task is beyond the scope of this paper. Furthermore, the conditionality of performance is so complex that the quantitative view shall be supplemented by more qualitative case studies of individual towns.

CONCLUSIONS

In the introduction to this paper, we argued that the small and medium-sized towns and their spatial constellations should be an integral part of our understanding of urban and regional systems. While they account for a substantial proportion of the population (20–45% in the regions investigated), they

are largely omitted from analyses. Using a functional-spatial perspective that emphasises the relations between settlements and cities, we have shown that many relatively small towns play an important role as local urban centres by providing jobs. Consequently, they attract substantial commuting flows from smaller village settlements in their hinterland, thus creating local microregions that are important geographical units in the population's daily life.

Referring to recent discussions on urban networks and polycentric urban regions, we stated that very little is known about the position of SMSTs within urban systems. In this respect, we sought to detect SMSTs which are isolated and autonomous, those SMSTs that are networked with other cities and towns, and analyse whether that is in hierarchically organised systems dominated by major cities or more polycentric networks, some of which may be solely based on SMSTs. The key contribution of our paper is the methodology for the typology of towns according to their positionality within urban systems and distinct territorial arrangements by focusing on whether they are autonomous, networked with other towns or agglomerated with large cities. The methodology provides a tool that can be used not only to learn about the structure and composition of various settlement systems, but also lays the ground for a comparative analysis of how towns perform according to their membership in different territorial constellations of towns and cities.

We used this methodology to empirically analyse and briefly compare the territorial arrangements of urban centres (towns and cities) in four European regions and countries. Furthermore, we conducted a simple analysis of population and job performance to indicate the effects of autonomous, agglomerated and networked positionalities within urban systems. The comparative analyses of settlement systems in Catalonia, Czechia, Central France and Slovenia indicate variability between the countries and regions in terms of the size of the urban centres and their urban regions as well as the various territorial arrangements existing within their urban systems. For instance, while networks of small and medium-sized centres account for 27 per cent of the country's population in Slovenia and 18 per cent in Czechia, they contain only 6 per cent of the population in Central France and 5 per cent in Catalonia, where nearly half the population lives in non-urban settlements and 45 per cent in large cities or SMSTs related to large cities.

The population and job performance analysis shows that in the three regions and countries investigated (Czechia, Central France, and Slovenia) there is a major difference between large cities and small and medium-sized towns but no major differences were revealed between SMSTs according to their functional types. However, this was just an initial observation. The scope of this paper did not allow for a more advanced and nuanced analysis of town performance in relation to positionality within the territorial arrangements and in relation to other factors, such as the effects of the regional and local economy, local culture, institutional set-up, and human and social capital.

Acknowledgments

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Notes

1. The algorithm of significant flows detection compares the distributions of actually observed flows with ideal configurations. We selected the five highest outgoing flows from each microregional centre, calculated the percentages of their sums and ranked them from the highest to lowest. Then, we correlated the real relative distribution of these flows with five ideal types of distributions:
    1. significant flow: 100%, 0%, 0%, 0%, 0%
    2. significant flows: 50%, 50%, 0%, 0%, 0%
    3. significant flows: 33%, 33%, 33%, 0%, 0%
    4. significant flows: 25%, 25%, 25%, 25%, 0%
    5. significant flows: 20%, 20%, 20%, 20%, 20%.

By reflecting the highest correlation between the set of observed flows and each of the five sets of ideal flow distributions, we determined the number of significant flows.

2. In Czechia, there were two urban centres with populations of below 50,000 but with positional values of over 2.5. Náchod has a population of 20,000, and it benefits from a network of several small urban centres nearby; we did not include this town among the large centres (cities). The other centre (Mladá Boleslav) has a population of 44,000 and a similar number of jobs. Since it is a very powerful job centre comparable to cities with a population of 70 to 80,000, we included Mladá Boleslav among the large centres (cities). However, there are seven urban centres with populations of over 50,000, which all have lower positions in the urban system (0 to 1). Most of these centres are in the vicinity of larger cities, which have either been agglomerated or have little regional influence due to competition from stronger and larger cities nearby. Hence, we did not consider these centres to be large cities. One exception is Ústí nad Labem, the regional capital of Northern Bohemia, which has a population of almost 100,000 and approximately 50,000 jobs. Because this city is not the destination of any significant flows from other microregional centres, we classified it as autonomous. The city does not attract any significant labour-related commuting flows from other microregional centres because its impact field is restricted physically by mountains and a border with Germany. Apart from having poor accessibility from microregional centres nearby, these centres are medium-sized towns that have stronger autonomy over their local labour markets. Although Ústí nad Labem has a weaker direct impact on the labor markets of other centres, it has a strong local microregional labor market and, at the same time, it is a strong political centre that impacts on the broader region. Therefore, we included Ústí nad Labem in the set of large centres. Out of the 260 microregional urban centres, we identified 14 large cities (centres).
3. We acknowledge the contribution of our colleagues with the ESPON TOWN project, who assembled the data from the case study regions and conducted the initial analyses to determine the typologies of towns and cities in the study area using our methodology. We carried out revisions, adjustments and further analyses for comparative purposes.

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FULL ARTICLE

Moving towards more cohesive and polycentric spatial patterns? Evidence from the Czech Republic

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Abstract

Territorial cohesion discourse represents normative and ideological vision of ideal spatial practices that should be applied in order to ensure balanced and polycentric spatial development. However, spatial diversity of existing territorial settings often diverge from political representations of spaces. Using the Czech Republic as a case study, the paper focuses on the development of urban system hierarchy by analysing the changes of work-commuting flows in the post-socialist period. The results show that the configurations of everyday spatial routines and functioning of real urban systems differ from political imaginaries to a great extent and are moving towards a more polarized pattern.

KEYWORDS

Czech Republic, polycentricity, significant commuting flows, territorial cohesion, urban systems

1 | INTRODUCTION

The issues of balanced spatial development has been part of EU regional policy and spatial planning narratives (EC, 2008; Molle, 2007) since the 1970s when the European Regional Development Fund was created. Territorial cohesion has become one of the most pursued concepts introduced by the Treaty of Lisbon as a new goal of the EU development strategy (EC, 2007), which shapes not only regional policy but also sectoral policies and spatial-development strategies (EC, 2008; EU Ministers Responsible for Spatial Development, 2011). The territorial cohesion is undoubtedly politically driven concept which provides only limited reference points to its operationalization and analytical treatment. It is primarily the heterogeneous discourse of spatiality what makes the issues of territorial cohesion so resistant to simple and all-encompassing analytical grasp. Following Lefebvre's (1991) triad of spatial practice,

representation of space and representational spaces territorial cohesion might be conceptualized as a specific representation of space combining rather ideological imaginary (Church & Reid, 1999) of just and balanced spatial practice with more or less systemized planning knowledge. It embraces partial normative territorial concepts like polycentric development or urban–rural partnership in which specific spatial configurations are highlighted as the ideal scenes for practicing multi-scaled spatial routines.

Polycentric development represents a meaningful contribution to the corpus of territorial cohesion agenda. Polycentricity discourse inevitably involves discussion on planning impacts to spatiality of European urban centres as well as topologies of inter-urban relations (Peters, 2003). The framing aim of the paper is to approach the issue of territorial cohesion from this very perspective of polycentric discourse in order to expose possible discrepancies between spatial normatives of the cohesion policy and the spatial practices underlying the development and functioning of the real urban system. Applying this research frame to the urban system of the Czech Republic after 1990, more targeted research questions could be formulated as follows. Do the ongoing changes make for more polycentric organization? To what extent spontaneously produced settlement patterns fit with normative imagination of polycentric and balanced space? What are the possible implications for cohesion-planning theory? The work-commuting flows will be employed here as a proxy of spatial practices producing and shaping the relational space of multiple ties between particular geographic places. The analysis allows the exploration of the changing centralities within the space of everyday commuting from 1991 to, 2011 and thus to critically discuss conformity between the real evolution of the Czech urban system and the discourse of cohesive polycentric development.

The paper is organized as follows. The next section discusses theoretical grounds of territorial cohesion concept with special attention paid to the polycentric spatial development and, more specifically, to polycentric development in relational space. In order to outline the context of the empirical analyses, the specifics of the Czech urban system development are described further in the section. Particular attention has been paid to the era of socialist central planning as well as to the subsequent period of economic and political transformation. Section 3 describes the data and methods employed in the analyses. Section 4 addresses the changes of work-commuting patterns and related issues of the job centres development between 1991 and, 2011 providing deeper view into the transformation of the network of central places. Finally, the analytical results are critically discussed in relation to contemporary European polycentric development discourse in Section 5.

2 | THEORETICAL AND HISTORICAL BACKGROUND

2.1 | Territorial cohesion as a normative political concept

The normative meaning of the territorial cohesion concept is still "fuzzy" and rather ambiguous (Davoudi, 2005; Evers, 2008; Faludi, 2004). Davoudi (2005) argues that such quick adoption of relatively vague term is related to its projection of positive perspective. In this respect, Davoudi (2005, p. 433) states that "ambiguity becomes an advantage because people of different convictions can sign up to them without committing themselves to any particular interpretation or any particular application." The result is a frequently used 'buzzword' in the context of "EU spatial development policy" (Sarmiento-Mirwaldt, 2015; Schön, 2005). Faludi (2005) suggests that territorial cohesion is primarily a political concept whose purpose is to build consensus. From a political perspective, clearly defined concept with precise meaning would not be helpful in reaching agreements and compromises. Despite his scepticism about concept's definability, Faludi (2009, p. 24) summarizes that "territorial cohesion refers to a situation whereby policies to reduce disparities, enhance competitiveness and promote sustainability acquire added value by forming coherent packages, taking account of where they take effect, the specific opportunities and constraints there, now and in the future."

One of the most striking features of territorial cohesion is the dichotomy between "competitiveness" and "cohesion" (Vanolo, 2010; Zonneveld, 2000). These two interpretations, defined by Waterhout (2008) as storylines of

"Europe in balance" (traditional cohesion objectives characterized by redistribution of financial resources that aims at reducing regional disparities and supporting development of peripheral and disadvantaged regions) and "Competitive Europe" (EU global and regional competitiveness, capital invested into the metropolitan cores and optimization of European territorial structure), originate from diversity of spatial planning traditions across EU member states. Consequently, heterogeneous mix of approaches to regional development through spatial planning concepts is reflected in the complicated definition of territorial cohesion as an umbrella concept for the whole EU territory. In order to interconnect conflicting storylines of "cohesion" and "competitiveness" the spatial planning concept of polycentric development was introduced to EU regional policy primarily by ESDP (EC, 1999).

2.2 | Polycentric development: crucial part of the territorial cohesion discourse

Polycentric development has been strongly supported since the adoption of ESDP at the end of the past century. As it is stated in ESDP (EC, 1999, p. 20), "the concept of polycentric development has to be pursued, to ensure regionally balanced development […] pursuit of this concept will help to avoid further excessive economic and demographic concentration in the core area of the EU." Thus, polycentric development stands for balanced and sustainable development, that is, the crucial goal of territorial cohesion. Additionally, polycentric development has been also related to the EU global competitiveness as a form of clustering of people and economic activity outside the existing core areas. As a result, more balanced spatial development would lead to more competitive Europe and its regions (Waterhout, 2002). From the policy-making perspective, polycentric development has gained its popularity due to stressing more balanced EU territory and also the importance of economic performance for territories lagging behind.

Besides the complexity of polycentricity emerging from cohesion-competitiveness dichotomy, polycentric development has multiple interpretations when the issue of scale is questioned. Territorial Agenda, 2020 (EU Ministers Responsible for Spatial Development, 2011, p. 7) aims "at polycentric development at the macro-regional, cross-border and also on national and regional level in relevant cases." In this context, realizing scale-dependency of the polycentricity concept is an essential factor for its better understanding (Taylor, Evans, & Pain, 2008; Vasanen, 2013).

When examining polycentric settlement settings in terms of mutual interactions, co-operation and complementarity between similar sized cities (ESPON, 2014), concept of relational space usually enters the game introducing specific metrics and topologies that emerge from various forms of linkages, processes, circulations and events (Barbour, 1982; Harvey, 2009). The boundaries between the objects in the space and the space itself are dissolved in relational conceptualization as the objects can be understood only in relation to other objects (Jones, 2009). Contextualizing this general logic in the planning theory (Graham & Healey, 1999), economic geography (Boggs & Rantisi, 2003; Yeung, 2005) or regional policy (Morgan, 2007) there is a clear departure from surface-alike physically-integrated space towards the Leibnizian space produced and folded through various kinds of social action between objects-places. At the same, this relational turn highlights the role of mobility, circulation, routinized flows (Cresswell, 2010; Shields, 1997), rhythms (Mulíček & Osman, 2018) and prefers functional rather than administrative spatial arrangements (Halás & Klapka, 2017) on various, often overlapping spatial as well as temporal scales (Marston & Smith, 2001). Polycentricity is in this respect a specific ordering of daily social and economic interactions that occurs in a territory without a clear dominant centre (Kloosterman & Musterd, 2001). The absence of dominant centres, however, is not a pre-given quality but it is deeply enrooted in the relational topologies of daily human lives and flows including commuting to work, school or services. Thus, integrated network of similar sized cities with intense mutual routine linkages is a basic assumption for defining polycentric urban region (Davoudi, 2003; Kloosterman & Musterd, 2001; Parr, 2004). From a relational viewpoint, the role of small and medium sized towns is significantly dependent on spatial position within the particular urban system. While being a part of metropolitan area might lower the importance of smaller towns (agglomeration shadow discussion—see e.g. Burger, Meijers, Hoogerbrugge, & Tresserra, 2015), localization of such towns in rural and less densely populated areas increases their centrality because of providing essential services for the surrounding municipalities (Van Leeuwen & Rietveld, 2011). Green Paper on Territorial Cohesion states (EC, 2008, p. 6) that "the role these towns play in providing access to services including the

infrastructure necessary to invest in the adaptability of people and enterprises, is key to avoiding rural depopulation and ensuring these areas remain attractive places to live." However, growing importance of metropolitan areas attracts population and economic activities from more distant areas and contributes to ongoing process of depopulation of peripheries (in some regions). Local towns situated in peripheral and rural areas are therefore losing their central position for its surroundings.

In comparison to monocentric urban systems, polycentric urban regions ensure plurality of choices regarding job opportunities and service functions (Malý, 2016). While the monocentric structure suffers from excessive concentration of human activities (means the most of regional economic activity in one place) that negatively affects environment, causes congestions and infrastructure degradation, polycentric systems should benefit from economies of scale and scope and clustering of economic activities (Kloosterman & Lambregts, 2001; Meijers, 2008b). In other words, polycentric development is an opposite of polarization resulting from disproportionate concentration of economic activities into one or a little number of centres (Ezcurra, Gil, Pascual, & Rapún, 2005; Maza & Villaverde, 2004). Polarization could emerge when the role played by local centres (mostly in peripheral areas) in economic and social development is decreasing and dominance of regional capital is growing. In presented study, polycentric development is therefore understood as a process characterized by growing density of urban centres' network with enhanced role of medium-sized and small centres, while polarization represents the development leading to excessive concentration of economic performance into a limited number of centres and deterioration of the others.

Although the normative of polycentric development is framed by robust theoretical background, its actual performance in real spatial practices has not yet been supported by analytical research. Veneri and Burgalassi (2012) focused on the possible relations between polycentric spatial arrangements and the economic performance (NUTS 2 regions in Italy). Their conclusions are, however, not in line with theoretical assumptions about the positive effects of polycentricity on regional growth. Just the opposite, they argue that polycentric configurations are rather associated with unequal economic performance (at least when income distribution is considered). Similarly, Meijers and Sandberg (2006) conclude that even the monocentric urban systems show in some cases more balanced socioeconomic development. Based on the analysis of regional discrepancies across European countries they "temper the policy enthusiasm over the concept's promise of bringing about cohesion" and "call for critical reflection" of polycentric development and its expected relation to spatial disparities (Meijers & Sandberg, 2006, p. 18). Furthermore, using the study on relationship between spatial configurations of national urban systems in Europe and regional disparities Häzners and Jirgena (2013, p. 206) claim that "polycentric development cannot be considered as a tool for diminishing regional disparities and providing more cohesion between regions." Also from a perspective of intraregional disparities, polycentric configurations do not guarantee better socioeconomic conditions and more equal development (Malý, 2016). Thus, supported by suggestions of Meijers (2008a) and Vasanen (2013), there is still a lot of fuzziness concerning the concept of polycentricity itself and its assumed impact on spatial disparities. It is inevitable to subject the idea of polycentric development to analytical approaches revealing the various aspects of spatiofunctional integration of different regions not only from spatial but also temporal perspective.

2.3 | The Czech urban system: Introducing the spatial context for the empirical analysis

The empirical part of the research is put into the spatial context of the Czech urban system, which has been characterized by the dense network of small and medium-sized towns since the Middle Ages (Horská, Maur, & Musil, 2002). The processes of urbanization and industrialization that took place until 1900 stabilized the network of microregional centres, while in the period prior to the Second World War mainly the position of Prague (and several other big cities like Brno, Ostrava, or Plzeň) were strengthened (Hampl, Gardavský, & Kühnl, 1987). During the second half of the 20th century the Czech Republic (as a part of the former Czechoslovakia) belonged to the group of Central East European socialist countries that were marked by relatively high levels of pre-socialist industrialization and urbanization, at least when compared to the rest of the socialist block (Dingsdale, 1999; Malý & Mulíček, 2016). The socialist industrialization, introduced in the near post-war period, was meant as a prominent political and

economic goal that was, however, accompanied by significant socio-spatial impacts (Malík, 1976). Industrialization policies implied not only the support of pre-socialist industrial urban centres; they aimed, at the same time, to strengthen the economic (industrial) potential of less developed regions and towns mostly situated in non-industrialized and rural parts of the country. However, Mareš (1988) points to the fact that the potential of many local labour markets was not often sufficient to ensure proper functioning of industrial production sites. Centrally command socialist economy therefore had to solve symptoms of a lack of compliance between industrialization and urbanization policies, for example, poor availability of qualified workforce, long commuting distances, or gender and age imbalance in the industrial towns (Gunko & Nefedova, 2017; Musil & Link, 1976).

As a consequence, socialist spatial planning practice started to pay more attention also to the non-productive aspects of urbanization and the specific spatial policy known as 'central settlement system' was set up. Theoretically based on Christaller's central place theory the planning scheme reflected non-productive and service urban functions that are of great importance for optimal housing standards and social cohesion (Enyedi, 1996). Paradoxically, in this period, socialist central planning built on the theory which has its roots in capitalist conditions (Germany). In fact, the central place theory has been subjected to large criticism due to a significant simplification of economic and demographic mechanisms (e.g., individual shopping behaviour, class differences, imperfect competition, transport costs) and due to applied perspective on space as a uniform platform of constant population density and purchasing power. On the other hand, the theory fit well into the socialist central planning apparatus which aimed at rather uniform urban hierarchy structuring, equal social conditions and overall homogenization of space. According to Musil (2001), by adopting the theory, urban planners wanted to fulfil one of the traditional normative principles of socialist planning, namely the elimination or at least reduction of the social differences between different territorial units. In the former Czechoslovakia, the role of normatively defined centres across the national territory was to provide basic public amenities where inhabitants from particular hinterlands can meet their needs for education, health care, or social care (Musil, 2001). At the end of a socialist period, the Czech urban system was largely comprised of a dense network of hierarchically structured urban centres which played a key role of local centres for rather well-defined hinterlands, especially in the peripheral and rural regions (to learn more about post-socialist rural landscapes see Janečková Molnárová, Skřivanová, Kalivoda, & Sklenička, 2017).

The economic and political transformation period beginning after 1989 has been characterized by demise of central command economy and by emergence of rather spontaneous and intense spatial processes within regional and local labour markets under the free-economy conditions. Tertiarization of the Czech economy accompanied by massive deindustrialization, especially in mining, heavy industry and manufacturing industries (Osman, Frantál, Klusáček, Kunc, & Martinát, 2015), redrew considerably the map of urban system dynamism. Decline in employment or even closing down of many factories negatively affected the socio-economic situation of mostly small and medium-sized towns whose development was often closely related to fully operational state-owned companies (Ouředníček, Špačková, & Feřtrová, 2011). On the other hand, progressive tertiary sector and foreign investments activities were concentrated into the inner parts of the largest cities or suburban locations of urban agglomerations (Sýkora & Bouzarovski, 2012).

The actual Czech urban system is dominated by Prague, the economic and administrative centre of national importance with the population more than 1,200,000 inhabitants; the second-tier large cities of Brno and Ostrava show significantly lower positions in terms of population and economic performance (Figure 1). The spatial pattern of daily activities is, however, still shaped by high number of medium-sized and small towns which traditionally play a crucial role in the Czech urban system morphological as well as functional organization. In this context, the Czech urban system shows a higher incidence of minor centres that represent pivotal spatial units in terms of wider urban system functioning (Sýkora & Mulíček, 2009). The national urban system can be thus subdivided into a large number of functionally integrated and relatively self-contained micro-regional units representing elementary territories of daily commuting to work, school and services, which number range from about 100–160 (Halás, Klapka, Tonev, & Bednář, 2015; Klapka, Halás, Erlebach, Tonev, & Bednář, 2014) to 250 (Sýkora & Mulíček, 2009) depending on the particular method of delimitation.

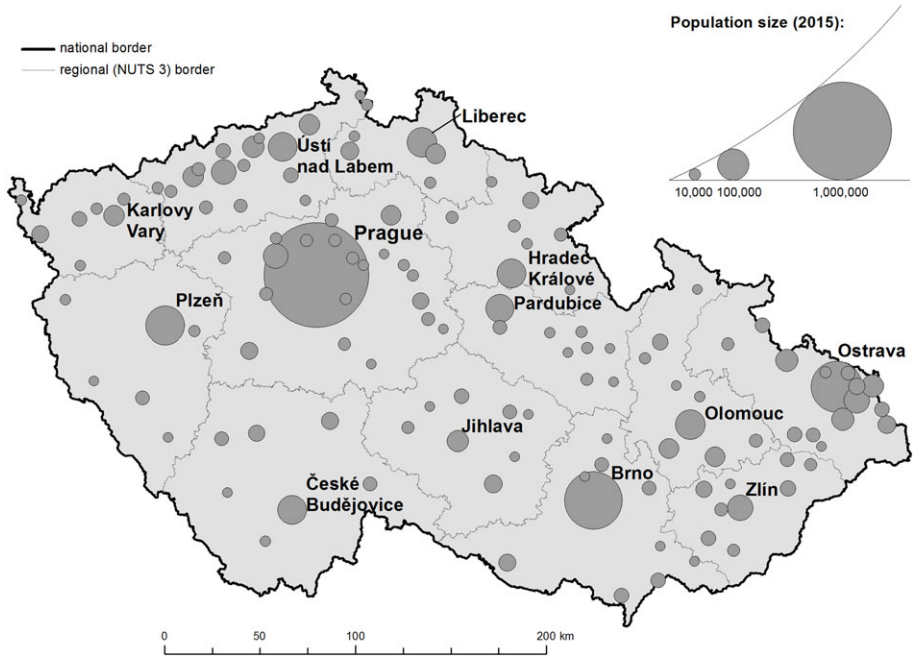

FIGURE 1 Urban system of the Czech Republic – municipalities with 10,000 and more inhabitants
Source: Czech Statistical Office (1991, 2001, 2011); authors' processing.

The paper aims at analysing the Czech urban system development by focusing on relational space of work-commuting flows and interpreting the results in the light of contemporary territorial cohesion discourse that, in its normative sense, shows remarkable similarities with socialist spatial planning doctrines in the former socialist countries in Central and Eastern Europe (Malý & Mulíček, 2016) despite its ideological and governance contradictions (Dąbrowski, 2014). From this perspective, the Czech urban system in the period 1991–2011 represents an analytical platform where the impacts of European neoliberal policies and principles of the free market can be well documented. While the relational space described by 1991 dataset still largely refers to the socialist configuration of the urban system, the 2011 situation reflects 20 years of multifaceted post-socialist development, with the advent of new spatial processes including suburbanization and metropolization (Ouředníček, Šimon, & Kopečná, 2015) as well as emergence of neoliberal planning discourse.

3 | METHODOLOGY

The empirical part of the paper employs census data on work-commuting flows[1] between municipalities in the years 1991, 2001 and 2011. Municipalities in the Czech Republic are the smallest administrative units and basic territorial

[1]Inter-censual comparability of work-commuting data is affected by missing identification of workplace by one-third of the economically active employed persons in 2011. This could limit consequent analysis, especially when calculating with the absolute size of work-commuting flows between municipalities. Thus, the database of work-commuting flows in 2011 was adjusted in order to enhance its operability. Data adjustment involves the redistribution of persons with unidentified municipality of workplace. Based on the knowledge of their number for each municipality of their permanent residence, they were proportionally assigned to economically active employed persons in a particular municipality with known workplace. The chosen procedure obviously cannot reconstruct precisely the actual spatial distribution of jobs, but approximates the various work-commuting flows to their real size at least. Some degree of inaccuracy might be observed when focusing on individual work-commuting flows. However, general trends and relations within urban system hierarchy, which are the matter of concern for presented paper, are affected minimally.

self-governing communities of citizens that are governed by elected representatives. There were 5,768 municipalities in the Czech Republic in the year 1991, 6,251 in the year 2011 (Czech Statistical Office 1991 and, 2011)—the increase of the number of municipalities after 1991 has been primarily caused by the efforts of some municipalities to become independent (predominantly forcibly merged municipalities in the socialist era). Accordingly, the urban system is rather fragmented at the LAU 2 level (Sýkora & Mulíček, 2009) and the matrix of inter-municipal work-commuting flows is very complex.

Following the empirical purpose of the paper the work-commuting flows are to be employed to indicate centres within urban system. The analysis is thus focused only on those flows that represent a meaningful bond between the pair of municipalities and the complete commuting matrix is purposively cut down to the reduced matrix of so-called significant flows. As shown in Table 1 the significant flows comprise approximately a half of total commuting volume in the Czech urban system. Significant flow might be defined here as the outgoing flow which proportion on the total volume of commuting from the municipality is significantly higher than the proportions of other, insignificant outgoing flows. Depending on the number of outgoing significant flows the municipality can be meaningfully assigned to one or more other municipalities which play the role of employment centre(s) in this respect.

A municipality is regarded as a centre if it is a destination of at least one significant flow. The method for determining the number of significant flows comes from an application of multiple linkage analysis (Haggett, Cliff, & Frey, 1977; Holmes & Haggett, 1977) presented by Van Nuffel (2007) and Van Nuffel, Derudder, and Witlox (2009). Multiple linkage analysis (MLA) has its roots in mathematical graph theory. In geography, concepts from graph theory were first used by Nystuen and Dacey (1968) who have shown how urban hierarchy can be described by the usage of flow data. Using primary linkage analysis (PLA), they reconstructed nodal structure and cities' bonds based on one dominant flow. Representing only one dominant flow, however, they ignored other sub-dominant flows with relatively high importance. Holmes and Haggett (1977) set up a criterion to separate "significant" (high importance) from the "insignificant" flows. MLA is thus an "extension of PLA that has been explicitly developed to deal with subdominant flows that are important for the spatial structure" (Puebla cited in Van Nuffel et al., 2009, p. 337).

Technique of significant flows determination is based on a comparison between model and real composition of the set of flows outgoing from a given municipality. In the first step, the five largest outgoing flows were selected for each municipality, their percentage shares of the sum were calculated and ranked from the highest to lowest.

TABLE 1 Model distributions of flows as a basis for determining the number of significant outgoing flows

	Model distributions of flows - the share (%) of flow in the sum				
	1st flow	**2nd flow**	**3rd flow**	**4th flow**	**5th flow**
Distribution 1 *(1 sign. flow)*	100	0	0	0	0
Distribution 2 *(2 sign. flows)*	50	50	0	0	0
Distribution 3 *(3 sign. flows)*	33	33	33	0	0
Distribution 4 *(4 sign. flows)*	25	25	25	25	0
Distribution 5 *(5 sign. flows)*	20	20	20	20	20
	The share (%) of flow in the sum (real observed distributions of flows)				
	1st flow	**2nd flow**	**3rd flow**	**4th flow**	**5th flow**
Real distribution	38.9	33.7	14.2	8.3	4.9
	Correlation of real distribution with ideal model distributions				
	Distrib. 1	**Distrib.2**	**Distrib. 3**	**Distrib. 4**	**Distrib.5**
Correlation with:	0.68	0.95	0.84	0.69	0.51

In the second step, this real distribution of observed flows was correlated with the five model distributions (see Table 1) simulating situation where there is just one flow from the municipality (distribution 1), two equivalent flows from the municipality (distribution 2) and so on up to the situation with five equivalent flows from the municipality (distribution 5). In the third step, the number of significant outgoing flows was determined by reflecting the highest correlation between the set of observed flows and each of the five sets of model flow distributions. The procedure is demonstrated in Table 1. The sizes of the top five outgoing flows from the municipality X are 112, 97, 41, 24 and 14 commuters which shares in the sum are 38.9%, 33.7%, 14.2%, 8.3% and 4.9% respectively. This real distribution of flows reaches the highest value of correlation coefficient (0,95) with the model distribution 2 (50%, 50%, 0%, 0%, 0%) – so we can determine that municipality X has two significant outgoing flows (the largest flow of 112 persons and the second largest flow of 97 persons), the other three flows are considered insignificant in this respect.

The motivation standing behind the application of this method is an effort to express the degree of polarization within Czech settlement system and its development between 1991 and, 2011. The application potential, however, strongly depends on the analytical and interpretative framework of the research. The presented paper does not deal primarily with the full description of Czech urban system where focusing only on significant flows could be perceived as problematic. Quoting Van Nuffel (2007, p. 510), we aim to measure "to what extent outgoing commuting is dominated by one flow towards a centre of employment, taking into account the proportions between several flows." The method enables to operationalize and quantify the concept of polycentrism, however, this particular operationalization should be understood just as one of several possible ways in which the polycentric settlement organization can be approached and measured. Sýkora and Mulíček (2017) employ significant flows in very similar way in order to distinguish particular tiers of small and medium-sized urban centres. There are two main issues associated with applied methodological framework. First, the significant flows approach co-defines the terms "centrality" or "central place" as rather binary terms referring to the fact that the municipality is (or is not) a destination of at least one significant flow. Second, it enables to reduce effectively the relational complexity of the urban system as a whole and to put focus on the principle bonds between centres and non-central municipalities. The hierarchical scaling of delimited centres is not absent as it combines external indicators (job-size of the centre) with the internal ones (the number and volume of incoming significant flows). At the same time, it is necessary to take account also of the interpretational limits related to the analytical method employed. The work-commuting flows represent just only a part of the totality of the relational space—there are more spatial practices like shopping or leisure time trips which co-produce the space of daily routines, whether monocentric or polycentric in its nature. Furthermore, the hierarchization of centres is rather hybrid in its nature, its interpretation is relevant just for given territorial and time framework. At the national scale, only data on work-commuting trips are available. In spite of that, work-commuting flows can be considered a backbone of daily spatial routines, which is well documented by recent researches (e.g., Erlebach, Tomáš, & Tonev, 2016; Halás, Klapka, & Tonev, 2016). Omitting other aspects of mobility may distort the picture of more detailed analysis, however, such limitation for national-scale study does influence the results only minimally.

At first, basic characteristics of urban system using the number of significant flows as fundamental variable are presented (Czech Statistical Office, 1991, 2001, 2011). Next, number of centres, significant flows and the total number of commuters are categorized according to the size (categories) of centres in terms of the number of jobs in order to assess the transformation of hierarchy of central places between the years 1991 and, 2011. The number of incoming significant flows represents the hierarchical position of centres by reflecting a scope of the commuting zone. More precisely, the number of significant flows for each centre actually provide information about the number of municipalities integrated to a centre by a strong functional relation involving journeys to work. The number of significant flows coming to the particular centre may be therefore equated with the number of municipalities assigned to this centre, that is, the number of integrated municipalities.

Comparison of two time periods has to cope with different number of municipalities in two stages (1991 and, 2011) of the Czech urban system development. There was an intensive increase of the number of municipalities

within twenty years of post-socialist development (from 5,768 in 1991 to 6,251 in, 2011) mostly caused by disintegration of many large municipalities in which two or more previously autonomous settlements were joined together during the socialist period. In fact, the most of new municipalities are small villages that preserve a strong linkage to the neighbouring regional or local centre (previously the village and the centre were part of one municipality). This relation existed in 1991 and also in 2011, however, as opposed to the situation in 1991 it is counted as a significant flow in 2011 (theoretically, commuting directions and extent can remain the same for both years, however, disintegration of one municipality into two municipalities might cause that for one year we observe one significant flow and for the second year there is no significant flow—simply because of changes in delimitation of basic spatial units entering the analysis). Thus, if new municipalities are a part of the analysis, we will witness a large growth of significant flows regarding the surroundings of selected regional/local centres but such a growth will be artificially "created" since it will be only the outcome of changes in spatial delimitation of administrative territorial units. As a result, the municipalities established after 1991 are not included in the analysis. Keeping them in a calculation for 2011 would distort the comparability of the number of significant flows. The commuting flows matrix of 2011 was therefore adjusted to the spatial structure of 1991. The municipalities which ceased to exist administratively after 1991 (subsumed into other municipalities) are also excluded from the analysis. The change of the total number of commuters in significant flows is relativized by the number of economically active persons in the Czech Republic in both years in order to respect the different economic population structure (smaller number of economically active persons in 2011 stemming from socio-economic and demographic changes).

4 | EMPIRICAL ANALYSIS

Determination of significant flows allows to identify centres; following the change of the number of centres, general findings on transformation of spatial organization of a particular urban system can be formulated. In the case of the Czech Republic, the number of centres dramatically decreased between 1991 and 2011 (Table 2). The number of centres in, 2011 reaches about 60% of 1991 value. In other words, nearly half of centres in 1991 lost their centrality

TABLE 2 Work commuting significant flows in 1991, 2001 and, 2011 in the Czech Republic

Centres and significant flows (SF)	1991[b]	2001[a,c]	2011[a]	2011/1991	
number of centres	1505	1103	857	0.6	↓
number of SF	9323	9030	8968	1.0	↔
total number of commuters (only SF)	943,003	864,630	883,212	1.0[d]	↔
share of SF of total volume of work commuting	0.55	0.50	0.52	1.0	↔
avg. number of SF originated in a municipality	1.6	1.6	1.6	1.0	↔
avg. number of SF directed to a centre	6.2	8.2	10.5	1.7	↑
avg. number of commuters commuting to a centre	627	784	1031	1.8[d]	↑
avg. number of commuters within one SF	101	96	98	1.0[d]	↔

Notes:

[a]The calculation excludes municipalities established after 1991 in order to ensure comparison of time periods.

[b]The calculation excludes municipalities annexed by other municipalities after 1991 in order to ensure comparison of time periods.

[c]The calculation excludes municipalities annexed by other municipalities after, 2001 in order to ensure comparison of time periods.

[d]The change is relativized by the total number of economically active persons in the Czech Republic in each year. Indicators are divided by the total number of economically active persons in a particular year and then the change is calculated.
Source: Czech Statistical Office (1991, 2001, 2011); authors' calculation.

function. On the other hand, the number of significant flows and the total number of commuters within the urban system remained more or less stable. The national urban system thus gets more polarized as there is decreasing number of destinations of the significant flows while their total volume and number do not change. This is well documented by the growing average number of significant flows assigned to a centre (from 6 in 1991 to more than 10 in, 2011) and average number of commuters commuting to a centre (from 627 to 1031). Looking at values of the year 2001, it can be argued that the change is quite continuous. Such a development strikingly points out the polarization tendencies arising from spatial concentration of economic activities and jobs respectively. Using the EU spatial planning terminology, detected development of significant flows pattern might be considered the opposite of balanced and polycentric development. The question is; which municipalities enhanced their role as a centre within an urban system and which municipalities were not able to maintain their economic centrality.

Categorization of centres according to their economic size in terms of the number of jobs provides necessary information for deeper understanding of the change of central places' organization (Table 3). Although a decrease in the number of centres in particular categories may be affected by the labour market adapting to a lower number of economically active persons in 2011, relativizing of the number of centres in each category by the total number of economically active population yields the same results. Hence, a mutual comparison truly refers to changes in the spatial dynamics and hierarchies of socio-economic relations within an urban system. The most significant decrease of the number of centres can be observed in the category of the smallest centres (decrease by 50% between 1991 and, 2011). This rapid decline of the economic importance of a large number of the smallest centres is accompanied by substantial fall of the number of significant flows and the total number of commuters coming to these centres.

As the overall change of the number of commuters and the number of significant flows is very small within the studied period, significant flows redirected from small centres have had to shift the whole structure of the centres'

TABLE 3 Centres of significant flows in the Czech Republic, the change between 1991 and 2011

Size category of centres (number of jobs)[d]	Number of centres			Number of incoming significant flows (number of integrated municipalities)				Total number of commuters (within SF)			
						2011/1991				2011/1991[c]	
	1991[b]	2011[a]	2011/1991	1991[b]	2011[a]	abs.	per 1 centre	1991[b]	2011[a]	abs.	per 1 centre
100,000<	4	4	1.0 ↔	861	1615	1.9 ↑	1.9 ↑	187,656	312,810	1.8 ↑	1.8 ↑
30,001–100,000	18	10	0.6 ↓	971	1033	1.1 ↑	1.9 ↑	166,444	143,583	0.9 ↓	1.7 ↑
15,001v30,000	33	26	0.8 ↓	1304	1168	0.9 ↓	1.1 ↑	171,981	131,273	0.8 ↓	1.0 ↔
7,501–15,000	55	49	0.9 ↓	1470	1579	1.1 ↑	1.2 ↑	147,315	137,064	1.0 ↔	1.1 ↑
3,001–7,500	145	97	0.7 ↓	1839	1705	0.9 ↓	1.4 ↑	149,458	102,426	0.7 ↓	1.1 ↑
3,000>	1250	671	0.5 ↓	2878	1868	0.6 ↓	1.2 ↑	120,149	56,056	0.5 ↓	0.9 ↓
All centres	1505	857	0.6 ↓	9323	8968	1.0 ↔	1.7 ↑	943,003	883,212	1.0 ↔	1.8 ↑

Notes:

[a]The calculation excludes municipalities established after 1991 in order to ensure comparison of time periods.

[b]The calculation excludes municipalities annexed by other municipalities after 1991 in order to ensure comparison of time periods.

[c]The change is relativized by the total number of economically active persons in the Czech Republic in each year. Indicators are divided by the total number of economically active persons in a particular year and then the change is calculated.

[d]Size categories have been defined in line with the Czech urban system hierarchy (the largest category represents the national or supra-regional centres, then regional centres follow, etc.). Interval changes provide only slightly different results – the main pattern of hierarchical changes remains the same.

Source: Czech Statistical Office (1991 and, 2011); authors' calculation.

hierarchy. Arguably, the largest centres with population size over 100,000 inhabitants increased their importance for a larger number of municipalities. This is evident when looking at the change of the number of work-commuting significant flows in the case of the largest cities. These centres almost doubled the number of incoming significant flows (the number of integrated municipalities) and the total number of commuters during the two decades while a number of those centres remained stable (Prague, Brno, Ostrava, Plzeň). The share of significant flows assigned to the largest cities substantially increased. The aggregate number of significant flows for categories of centres providing 3,000 to 100,000 jobs is without a substantial change, however, the number of centres reduced in all these size categories. Thus, the number of integrated municipalities per one centre increased (a particularly steep increase occurred especially in the category of the second largest centres). Similar results can be seen for the change of the total number of commuters per one centre. Unlike other job-size categories of centres, the smallest centres are characterized by decreasing numbers of commuters per one centre—contrasting with the enlargement of the number of municipalities integrated to the small centres. Although general tendencies of the change of central places' structure can be identified, more detailed perspective is required in order to better understand the spatiality of complicated commuting patterns and interactions.

The change of the number of significant flows as well as the change of the total number of commuters can be categorized according to a degree of growth or decline (Table 4) in order to effectively complement the previous analysis. In other words, we can observe inner variability of particular size categories (for instance, focusing on the third size category 30,001–100,000 we see that 60% of centres experience strong growth and 40% of centres moderate growth in terms of the number of incoming significant flows; and 60% of centres are characterized by strong growth, 20% of centres by moderate growth and, 20% of centres experience stagnation in terms of the total number of commuters within significant flows). While most of the larger centres are characterized by strong (or moderate) growth of flows and commuters, with decreasing size of centres the regressive trends seem to be prevailing. The centres within the two largest size categories show solely increasing number of integrated municipalities. The next three size categories (3,000 to 30,000 jobs) represent mostly centres characterized by stagnation

TABLE 4 Work commuting characteristics according to the size categories of centres, the case of the Czech Republic

Size category of municipalities (number of jobs in, 2011) being centres in 1991 and/or, 2011	The share (%) of centres experiencing: change of the number of incoming significant flows [a,b]/change of the total number of commuters within SF [a,b,c]				
	strong growth (>1.50)	moderate growth (1.11–1.50)	stagnation (0.91–1.10)	moderate decline (0.51–0.90)	strong decline (<0.51)
100 000<	50/25	50/50	–/25	-	-
30 001–100 000	60/60	40/20	–/20	-	-
15 001–30 000	–/12	42/15	46/19	12/50	–/4
7501–15 000	6/4	31/20	43/25	20/49	–/2
3001–7500	6/10	24/10	31/12	26/39	13/29
3000>	13/12	2/1	11/2	12/8	62/77
All centres	13/12	5/3	13/4	14/13	55/69

Notes:

[a]The calculation excludes municipalities established after 1991 in order to ensure comparison of time periods.

[b]The calculation excludes municipalities annexed by other municipalities after 1991 in order to ensure comparison of time periods.

[c]The change is relativized by the total number of economically active persons in the Czech Republic in each year. Indicators are divided by the total number of economically active persons in a particular year and then the change is calculated.
Source: Czech Statistical Office (1991 and, 2011); authors' calculation.

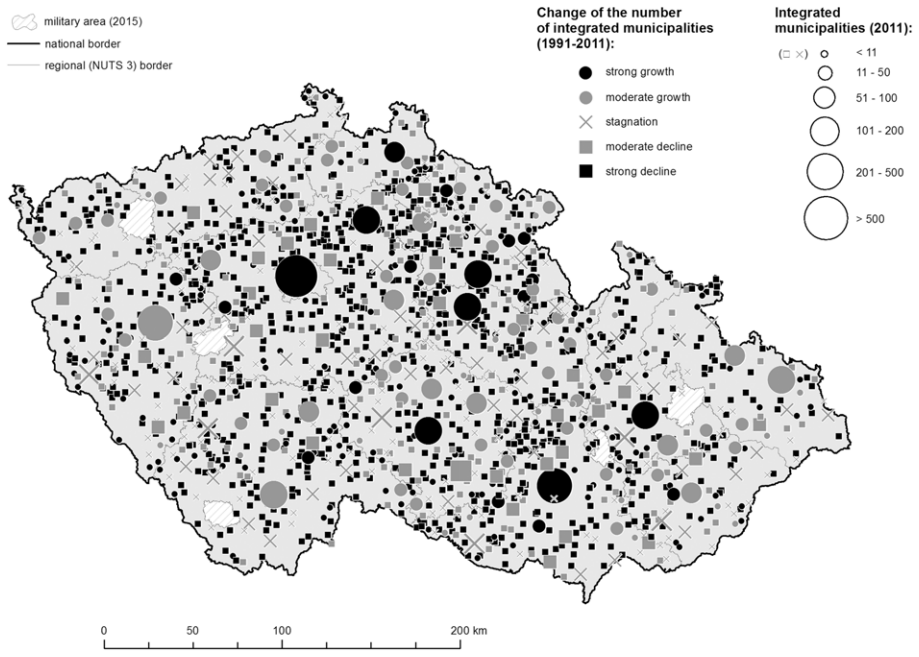

FIGURE 2 Change of the number of integrated municipalities between 1991 and 2011, the case of centres of significant flows in the Czech Republic
Note: The category "strong decline" includes 779 centres that lost all incoming significant flows after 1991.
Source: Czech Statistical Office (1991 and, 2011), authors' processing.

of the number of integrated municipalities and by the loss of the economic attractiveness regarding the number of in-commuters. More than one half of the smallest centres experienced strong decline in terms of the number of integrated municipalities as well as the number of in-commuters. Concentration of significant flows goes hand in hand with an increasing number of commuters travelling to work into the largest centres. This development takes place at the expense of medium-sized towns at the micro-regional level and especially local towns that are characterized by an extreme centrality function decline.

A close association between the number of integrated municipalities (significant flows) and job size of centres (in 2011) is supported by a value of Pearson's correlation coefficient $r = 0.94$. However, some exceptions can be identified when a centre attracts the above-average number of significant flows compared to its job size (relatively "peripheral" centres with wide hinterland attracting commuters from a large number of small municipalities) or when a centre is a destination of a lower number of significant flows compared to those expected based on its size (the influence of competing centres in the close proximity). The latter case is particularly visible within the largest agglomerations, principally Prague and Brno metropolitan areas (Figure 2). While the core cities are characterized by strong growth of incoming significant flows, their hinterlands are comprised of declining centres that may suffer from the agglomeration shadow effect, that is, reducing urban functions due to centripetal forces of higher-ranked metropolitan centre (see Burger et al., 2015; Partridge, Rickman, Ali, & Olfert, 2009). Hence, expectation of how strongly networked particular centres are should be based on the position and functional integration of centre within broader urban system. From the late 1990s, urban system development is strongly affected by intensive residential suburbanization processes within which the hinterlands of large Czech cities became the zones of large population increases (Sýkora & Mulíček, 2012). As the suburban immigrants largely keep their jobs in the core cities, this development does not contribute so far to the strengthening of the economic attractiveness of minor urban centres

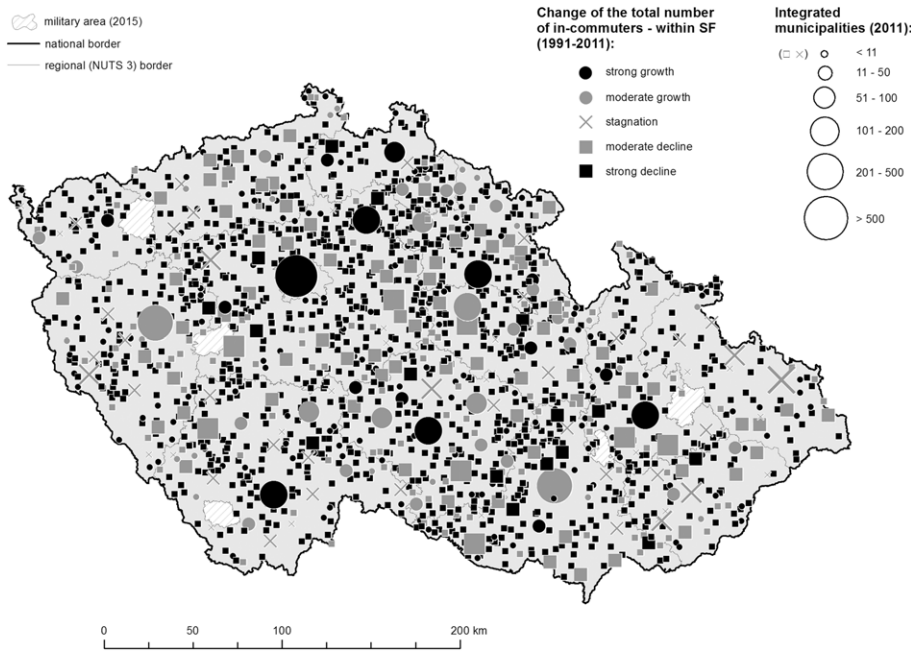

FIGURE 3 Change of the total number of in-commuters between 1991 and, 2011, the case of centres of significant flows in the Czech Republic
Note: The category 'strong decline' includes 779 centres that lost all incoming significant flows after 1991.
Source: Czech Statistical Office (1991 and, 2011), authors' processing.

in the hinterlands; instead the volumes of the work-commuting flows from the hinterland to the metropolitan cores have increased.[2]

Polarization within the Czech urban system is even more evident when the change of the total number of commuters is taken into account (Figure 3). While the number of significant flows remains stable for most of medium-sized centres, the volume of these flows (the total number of commuters) weakens. Such a trend has markedly occurred

[2]The Western-type suburbanization processes were dampened during socialist period in many European socialist countries (Tammaru, 2001); post-socialist suburban boom at the end of the 20th century can be partly perceived as a reflexive correction towards development trajectories typical for the Western urban system. A number of authors agree on the fact that suburbanization represents major qualitative shift in the post-socialist Czech urban system development (Čermák, Hampl, & Müller, 2009; Ouředníček et al., 2015; Sýkora & Mulíček, 2012). There is, however, a lack of consensus on the quantitative dimensions of suburbanization regarding the migration volumes as well as impacts to the commuting patterns. The ambiguity of suburban zones delimitation, methodological uncertainty related to analytical definition of suburbanization and only limited availability of data describing the socio-economic profiles of suburban migrants are the main reasons that make very difficult to build up a generalizing quantitative description of suburbanization in the Czech Republic. As for the impacts to the work-commuting relations, the analyses of Čermák et al. (2009) or Sýkora and Mulíček (2014) show that the residential suburbanization is followed (at least at the major Czech metropolitan regions) by relatively strong non-residential suburbanization of jobs, often located outside the minor urban centres in the hinterlands. The suburban migrants, largely well-educated and employed in tertiary and quaternary economic sectors, however, occupy only small part of those new suburban job opportunities. Imbalance between socio-economic profile of suburban migrants and the structure of the suburban jobs (Sýkora & Ouředníček, 2007) results in complicated patterns of metropolitan work-commuting flows, including cross-commuting and reverse commuting. In order to underpin the argumentation in the paper, we can conclude that: (i) suburbanization unquestionably increase/redirect the volume/direction of significant flows from the suburbanized municipalities to the metropolitan centres; however, the quantification of these impact is out of the scope of presented analysis; (ii) high spatial variability of the intensity of suburbanization processes both at the national (differences between particular metropolitan regions) and micro-regional (differences between particular municipalities within metropolitan region) level has to be taken into account as it can bias any generalization; and (iii) the post-socialist job-shrinkage in the small industrial centres in the hinterlands seems to be much more important factor reshaping the work-commuting flows pattern compared to suburbanization process.

within the area of the Ostrava agglomeration, north-western part of the country and in the wider Prague's and Brno's hinterland. Regarding the notion of polycentric development at the national level, the domination of Prague is not equally counterbalanced by the growth of other largest agglomerations and regional centres. Moreover, micro-regional centres are losing their importance and the concentration of economic activities becomes more significant.

5 | DISCUSSION AND CONCLUSION

The updated version of Spatial Development Policy of the Czech Republic approved in, 2015 introduces polycentric development as one of the eighteen national priorities concerning sustainable, integrated and cohesive planning. The document obliges national and regional planning authorities to "(S) upport polycentric development of settlement structure. Create conditions for strengthening partnerships among cities and countryside and improve thus their competitiveness" (Ministry of Regional Development CZ, 2015, p. 16). These tasks are to be fulfilled by promotion of job opportunities and inter-municipal co-operation. The mentioned priorities are attuned with European normative planning agenda as described in the introduction of the paper. The empirical analyses presented in the text, however, illustrate that normatively defined goals of cohesion (or polycentric policies respectively) diverge from the actual path of the Czech urban system development. The analyses carried out derive the spatiality of urban system from the patterns of work-commuting significant flows. In spite of the fact that labour-systems organization represents just a part of functional totality of national urban system, this approach allowed relatively simple but still comprehensive view of changes of relational practices shaping the space (s) of everydayness. Covering the period from 1991 to, 2011 the analytical results indicate rather gradual re-centralization within relational space defined by commuting flows. The notion of re-centralization refers not only to more polarized structure of work-commuting centres but also to much broader shifts in the scale and spatial embeddedness of daily routine as the central places play a constitutive role in production and representation of space.

The functioning of urban system as analytically depicted for the year 1991 was based vitally on the presence of numerous small job-centres. They can be viewed as materialized and rather persistent symptoms of specific spatiality having its roots in political and socio-economic milieu of socialist central command economy. Since the 1960s normative urbanization strategies were developed in the former Czechoslovakia in order to harmonize the spatial pattern of industrial job opportunities with housing and amenities development (Malý & Mulíček, 2016). The hierarchized network of job centres and their respective daily urban systems emerged; it was institutionalized and stabilized in time through planning narratives stressing the issues of jobs, homes and service of general interest accessibility. The dense pattern of socialist (industrial) job centres, many of them of rather small size, represented polycentric organizational model (when applying current terminology). The territorial cohesion stemmed from proximity which could be seen, at the same time, as a result of limited spatial mobility and planning rigidity.

The matrix inherited from the times of socialism began to change in the mid-1990s. The empirical analysis shows the fall of the number of centres in 2001 and 2011 respectively while the total volume of commuting within significant flows remained virtually flat. The actual spatial pattern gets more polarized and perhaps less polycentric in comparison with 1991. The increasing importance of the decreased number of "successful" centres is then a reflection of a competitive economic environment suddenly emerged during the socio-economic transformation after 1989 in the post-socialist countries. There was, however, more impetus for change than shifting economic conditions resulting into the recentralization of investments, production and consumption at the expense of minor urban centres. It is necessary to mention deep social-spatial and socio-cultural changes accompanying the political and economic transition. Demand for owner-occupied housing and the sharp increase of individual mobility can be seen as the triggers of massive suburbanization processes, which reshaped and rescaled the space of everyday relations especially within large metropolitan areas. In the case of large Czech metropolitan areas, substantial numbers of inhabitants moved from the core city, however, without building any deeper work or consumption bonds to the secondary urban centres in the hinterland.

The development of urban system hierarchy is being far from normatively defined balanced spatial development emphasized by the territorial cohesion discourse. It seems that there is, at least in the Czech Republic, a lack of effective planning tools capable to operationalize the 'grand narratives' of current European planning debates. While the planning doctrines within the socialist central command economy were tightly coupled with resources and investments re-distribution, the current bond between planning imaginations and grounded territorial policies appears much weaker. Given that there are only limited resources to compare recent (re) centralization developments in individual European countries (ESPON, 2014; Geyer, 2002) we should avoid overall generalization of the results to the whole Europe or other regions of the world. There are obviously several specifics common for post-socialist urban systems (Sýkora & Mulíček, 2017), such as rapid deindustrialization or delayed onset of suburbanization. There are, however, also differences between post-socialist regions that are related especially to diverse socio-economic conditions and forms of centralistic principles within planning doctrines during the socialist regimes and consequent differences in transformation process after the collapse of the socialist block. Comparative studies concerning not only post-socialist urban systems' development trajectories but also other western countries should help to get clearer picture in terms of uniqueness or similarities of urban systems developing under different circumstances and from historically different starting positions. Regarding functioning of urban systems having its roots in capitalist conditions, we assume that the results could differ in some aspects particularly due to the earlier "boom" of metropolization processes, distinct levels of personal mobility, labour market specifics and spatial planning traditions.

Finally, moving beyond the results of quantitative analysis several other issues can be addressed. The question is, to what extent the polycentric deficit deduced from the decline of the number of job centres is (or can be) counterbalanced by the increasing division of labour within the urban system. To what extent the more polarized pattern of centres relates to increased levels of personal spatial mobility and actual spatio-temporal habits of economically active population.

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Resumen. El discurso de la cohesión territorial representa una visión normativa e ideológica de las prácticas espaciales ideales que se deberían aplicar para asegurar un desarrollo espacial equilibrado y policéntrico. Sin embargo, la diversidad espacial de las configuraciones territoriales existentes difieren a menudo de las representaciones políticas de los espacios. Utilizando a la República Checa como estudio de caso, el artículo se centra en el desarrollo de la jerarquía del sistema urbano mediante el análisis de los cambios en los flujos de desplazamientos al trabajo en el período postsocialista. Los resultados muestran que las configuraciones de las rutinas espaciales cotidianas y el funcionamiento de los sistemas urbanos reales difieren en gran medida de los imaginarios políticos y se mueven hacia un patrón más polarizado.

抄録: Territorial cohesion discourse（地域的結束の講話)とは、均衡的かつポリセントリックな空間開発を確実にするために採用されるべき理想的な空間的実践の規範的および観念的なビジョンを表している。しかしながら、既存の領土設定の空間的多様性は、空間の政治的代表（political representation)から乖離していることが多い。本稿では、チェコ共和国のケーススタディを用いて、社会主義後の労働‐通勤のフローの変化を分析し、都市システムの階層の発展に注目する。結果から、現実の都市システムの日常の空間的ルーチンと機能の構成は、政治的な想像とは大きく異なっており、より分極化したパターンに向かっていることが示された。

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Urban rhythms: A chronotopic approach to urban timespace

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Abstract

This text attempts to examine the structuring of the urban environment, taking into account the geographically traditional spatial aspects of various phenomena as well as their temporal characteristics. Places are anchored in time and time in turn may be said to unfold in space. It is thus impossible to achieve an understanding of space without the necessary temporal dimension; indeed, the debate over the conceptualization of timespace has gained considerable currency in the social sciences. This text forms a response to this point of interest, providing a discussion of the chronotopic approach. The first part examines the concept of time and timespace, respectively, in the social sciences; particular attention is paid to the non-trivial aspects of the relationship between time and space. The abovementioned chronotope analytical and interpretive model is utilized throughout. For the purposes of this article, the model is defined as a specific part of the urban space defined by a unique temporality, i.e. based on a specific combination of overlapping rhythms. Such an approach opens up the possibility of regionalization on the basis of a specific temporality on different spatial scales. The empirical part of the text attempts to characterize the differentiation of urban space in Brno on the basis of a spectral analysis of three selected rhythms – the work cycle of a given locale, average duration of shopping session and public transport frequency. Model cases of selected urban chronotopes are subsequently developed on the basis of the rhythmicity of these activities.

Keywords

Chronotope, urban timespace, pacemaker, rhythm, place

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Introduction

The image of the city in literature or cinema often metaphorically reflects an important, yet little explored urban attribute: a city's internal rhythm. Cinematic and literary narratives often combine the spatiality and temporality of individual streets, squares and neighbourhoods in order to provide a compelling and vivid image of an urban place which corresponds to the everyday experience of individuals living in a cyclic temporality (rhythmicity) in both the physical and social structures of a particular city. By contrast, most urban surveys which deal with the spatial differentiation of urban landscapes are still based on the principles of classical physics and a Kantian understanding of geography and history as specific scientific disciplines (Schaefer, 1953); the phenomena and processes of the production of space are thus generally perceived as being separate for three-dimensional space and for the axis of linear time flow, respectively. Such surveys simply understand space as an independent and static opposite to the unceasing one-way flow of time (Crang, 2005).

In case the concept of an absolute, geometrically indexed space is supplanted with the doctrine of an alternative relational, object-oriented space (for more information see e.g. Harvey, 1997; Hooker, 1971; Massey, 2004) shaped by relationships between entities, according to Massey (2005), a new conceptualization of time is required as well – perhaps even a conceptualization merging the categories of time and space into a complex timespace system.

However, such a reconceptualization or integration of time and space has not yet been sufficiently explored. Timespace concepts developed in the field of theoretical physics are difficult to integrate into the theoretical research conducted in the social sciences. On the other hand, the discussion regarding the relationships between spatiality and temporality and the issue of static representation has been examined in the context of human geography and sociological research (e.g. Baumann, 2000; Giddens, 1990; Massey, 2005); however, as the discussions have been relatively abstract, adapting their outcomes for the purposes of empirical research is likewise very difficult (Lee and Sawyer, 2010). Current discourse regarding the relation of time and space in contemporary social theory thus generally bypasses the timespace routines of everydayness, although it is precisely at this point on the scale that perhaps the most obvious spatialization of time takes place, either by means of a multiplicity of duration, cycles and rhythms and their reflections in the form of social or physical structures.

This text thus aims to fill – from the point of view of human geography – a void which currently exists between the theoretical concepts of timing space (spacing time) on the one hand and their empirical verifications in

everyday urban life on the other. For the purpose of this study, temporality and rhythm are perceived as key attributes of constructing a new – rarely used, at least in geographical research – dimension of place. The chronotope concept is presented as a theoretical model which – following rhythmanalysis and thanks to the concept of pacemakers – is subsequently transformed into a tool for the analysis of the spectrum of overlapping rhythms at a specific location. The multiplicity of overlapping rhythms as manifested at a particular location by the emergence of spatially and functionally contextualized temporality is supplemented with examples of transport, retail and work rhythms in the city of Brno, found in the empirical section of the text. The attention in three case studies is focused on related rhythms, that is, the duration of the interval between two successive departures of public transportation (the example of local-level rhythms – minute locality), the duration of a typical shopping session (supra-local rhythms – hour quarter) and people's presence or absence conditioned by their residential/employment patterns taking place in the studied locality (city-wide rhythms – day city) are examined in detail. Furthermore, the empirical part is finished by a complex description of the multiplicity of overlapping rhythms in selected urban district in Brno (large housing estate Brno–Lesná). Necessary methodological notes are outlined in more detail at the beginning of individual case studies.

The role of time and rhythm in the creation of place

The relationship of time and space in the urban environment offers a wide range of topics and interpretations. Naturally, the advent of industrial capitalism and urbanization resulted in a radical transformation of the timespace organization of society. Many authors have described the profound differences between the timespace of rural and urban societies; moreover, the above mentioned duality of rural × urban may also be used to distinguish between two concepts of time. Event-time – typical of rural agrarian communities – is time structured according to activities or tasks rather than made up of abstract units such as minutes and hours. As such, it stems from the specific geographical, social and economic attributes of a specific location, the seasonal nature of activities and local heritage (Levine, 1997; Urry, 1995). By contrast, the mechanical clock-time typical of an industrial (urban) society constitutes 'empty' time which is not anchored in the local social and economic activities. It is often referred to as the time of industrial capitalism, in which productivity is not measured by tasks completed but by the duration of working time (Adam, 1990; Kellerman, 1989; Šubrt 2000).

The default rural/agricultural vs. urban/industrial dichotomy is reflected in the division between the cyclical time of primarily traditional pre-industrial societies and the linear time of industrial cities. Kellerman (1989) speaks of the 'de-cycling' of urban time in response to how urban services and technologies contribute to the blurring of boundaries between the alternating rhythms of day and night, working days and holidays, summer and winter. On the other hand, e.g. Urry (1995) considers the linearity of the city a controversial concept, as cycles and timespace routines remain an important element of place identity even in contemporary cities. The repetition of activities in the same geographical locations and time points in a day, week or year, however, cannot be understood as a return to the same spatial and temporal coordinates: it is essential to assume the existence of more or less distinct cycles moving along in line with linear time. The acceptance of the concept of linear-cyclical time in the analysis of urban temporality thus seems to constitute the only solution to the conflict hinted at above.

Time content is also an important constitutional element of place for Nigel Thrift and Donald Parks, who refer to timing space, generated according to how time is treated within that space. According to their notions, spaces are structured by time into places, which represent a kind of stasis – pauses in movement, time movement, a specific materialization/visibility of time in a particular place (Lynch, 1972; Parkes and Thrift, 1978, 1980).

This corresponds to Giddens's characterization of social life as a reciprocal presence and absence, i.e. availability and unavailability. Giddens discusses the traditional notion of place and, alluding to the concept of *locale*, provides an interconnection between place and its immediate time-space context (Giddens 1985).

The perception of the spatial context of time was significantly influenced by Henri Lefebvre, whose rhythmanalysis constitutes a significant step towards the challenging of the time-space duality. Lefebvre perceives rhythm not as the object of study but instead as an analytical tool: rhythm is present in every interaction between place, time and energy invested (Lefebvre et al., 2004: 15). His concept of rhythm thus constitutes an observable property of timespace and in this respect provides a tool for the observation of the unobservable (Lefebvre et al., 1996). While rhythmanalysis does not presuppose quantification, it does not hinder it in any way. In his 'The Critique of the Things', Lefebvre refuses the notion of anything static or permanent. According to Lefebvre, the nature of things is not based on continuity, inertia or the absolute, but rather on a specific combination of different rhythms associated with individuals, observers or perhaps a certain perspective (Horton, 2005). Things may be analyzed by means of a purely quantitative addition and subtraction of short or long,

individual or collective rhythms – each individual moment has its own particular rhythm, or rather it is such a rhythm. The rhythm must also be associated with a specific place and may thus even be described as a specific localized time or – conversely – as temporalized space. Thus, just as all things are formed by specific constellations of various shifting rhythms, so are places themselves (Lefebvre et al., 2004: 89). Lefebvre refers to things and places as certain polyrhythmicities which may be understood by breaking them down into individual rhythms, studying them in detail and performing a subsequent synthesis. Lefebvre thus defines a single powerful conceptual tool for the study of timespace: rhythm.

The relationship of time and space in an urban environment has also been studied by Massey (2004: 262). Massey describes the city as an open timespace system of social relationships composed of partial subsystems and linking various groups and activities, emphasizing that most urban activities are not projects conducted by a single individual. This suggests the role of a city as a space characterized by a plurality of places and times as well as by a certain potential to unify such timespaces. In order to be implemented efficiently, a number of activities require coordination between multiple projects both in terms of time (synchronization) and place (synchorization). The aggregation of partial timespace rhythms of individuals present at typical locations in typical times (at home during the night, in the workplace during the day, etc.) may help establish a specific place temporality, which stems from a rhythmical presence/absence of people and activities (Parkes and Thrift, 1975). This temporality also contributes to the identity of a place, which may be multiple (a park by day as a place of rest as opposed to the same park by night as a dangerous area). Giddens (1984) develops the idea even further, arriving at a concept of timespace regionalization and depicting regional boundaries as not necessarily physical or spatial-functional in nature but as so-called *time-space edges*, i.e. the boundaries between zones of different cycles and rhythms.

Chronotope

A specific example of overcoming the time-space duality is offered by the chronotope concept. While the term *chronotope* was originally associated with the theory of relativity, it was first used in the context of the social sciences by the Russian philosopher and literary critic Mikhail Bakhtin. Bakhtin uses the dialogue method in order to overcome binary oppositions. Like Lefebvre, Bakhtin sees the essence of certain entities in their existence in mutuality, i.e. in relationships or in dialectical interconnection with other entities. Relationships between *here* and *there, inside* and *outside, self* and *other, past* and *future, time* and *space* are thus not perceived as mutually

exclusive, but rather as one element automatically incorporating the latter. Bakhtin focuses primarily on the relationship between the *self* and the *others*. He emphasizes that an individual is not capable of seeing him/herself as a whole – each individual needs the others in order to understand him/herself (Holloway and Kneale, 2000: 73–74). Bakhtin refers to this mutuality as a dialogue, characterized by a constant interaction between meanings (Folch-Serra, 1990: 259–261). Utilizing a similar dialogic logic framework, Bakhtin also refers to the mutuality of *time* and *space*, as he deems it impossible to understand place without time and time without place (Bakhtin, 2002: 15–16). Similarly, notions have been espoused by Lynch or King, who refer to space which contains more than the here and now, space resonating with its past and offering a view of the future (Lynch, 1972: 90–95; King, 2008: 69).

Bakhtin utilizes this aspect in the analysis of fiction and literary works, referring to it as a literary artistic chronotope. He perceives the chronotope as a formally constitutive literary category capable of expressing the inseparability of time and space. In it, spatial and temporal clues merge into a meaningful and concrete unity – time thickens, takes shape and materializes, while visible space acquires meaning and is measured by time (Bakhtin, 1980: 222). Bakhtin refers to this world as a world that creates text, literature, scenarios, etc., but which also contributes to its representation, production and reproduction. Literary texts thus represent the temporal and spatial (i.e. chronotopic) culture of a society at the time of their creation (Folch-Serra, 1990: 262).

The chronotope was first utilized in geography in the 1990s by Mireya Folch-Serra. Folch-Serra focuses on Bakhtin's *self*, dialogically constituted thanks to the *others*, highlighting the interpretation of each statement from a dual perspective of the self and others and utilizing it in order to establish methods for the study of landscapes, regions and places. Space is thus constructed from the perspective of continuous dialogic interaction on the part of various statements, speeches, voices – a specific chronotope based on the current ratio of opposing centripetal (monologic) and centrifugal (dialogic) forces (Folch-Serra, 1990: 255–258). The author also points out the possibility of analyzing the makeup of spaces from a range of statements, texts and relevant literature. However, this dialogic structure does not allow for spatial repeatability, testability and verifiability, it goes beyond the usual geographic bearings and explanations and requires the interpretation of the observed. Folch-Serra's concepts go beyond the mere 'graphic visibility' of landscape, region and place in a spatial context and focus on 'narrative visibility' in time, thereby exceeding the required visual criteria and turning geographers into interpreters of natural conditions (Holloway and Kneale, 2000: 82–83).

The most systematic geographic application of the chronotope to date has been developed by Mike Crang. Crang considers three basic issues: the space in question, the time and the relationship between them. A number of partial concepts of time and space naturally exist; paradoxically, a great majority are dualistically defined being in opposition to one another (Crang, 2005: 200). Crang mentions the classic Euro-American concept of time and space as an inert and empty container waiting to be filled (time-geography). He contrasts this with a metaphor of space as raw clay, waiting to be modelled. Heidegger differentiates between Being and Becoming, which allows for a consideration of place not as a given, but rather as something that only occurs, happens – place as an action or event rather than as a simple location (Crang, 2001). The city, like the place, is perceived as becoming, namely by means of circulation, combination and recombination of people and things (Crang, 2001: 190). Crang comes quite close to Lefebvre's concept of the thing as a kind of polyrhythmicity. Crang's concept thus makes direct allusions to Bakhtin's chronotope and Lefebvre's rhythmanalysis and attempts to integrate the two. Time is not considered empty and linear – instead, the Greek term *kairos* is used to denote something unique: time as something which enters into situations and influences them, time as something suitable for certain events but not for others, time which may be good, bad, difficult or fast, time which only occurs in a particular place and which makes it possible to speak about specific and unrepeatable time occasions of everyday life, i.e. the spirit of the moment (*genius tempori*) (Rämö, 1999: 312–313). The term *topos* is used with similar sensitivity for descriptions of place. Like Bakhtin, Crang thus perceives the chronotope as a certain harmony, a reciprocity of time and space and a unity of a specific temporality associated with a specific place. In other words, time and space only *become* in a specific joint timespace (Crang, 2005: 214). However, place need not be (indeed, frequently is not) rendered by a single time, but by a serial constellations of temporalities (Crang, 2001: 190).

Urban time policies research, most developed in Italian context, employs basically similar theoretical conceptualization of chronotope. Referring implicitly to Lefebvres's 'polyrhythmia' Mareggi (2002) or Bonfiglioli (1997) perceives chronotope as a multi-scalar concept closely linked to urban everydayness. It embraces not only the physical qualities of urban places but also place-based rhythmicities stemming from the presence or absence of residents and temporary inhabitants, from their differentiated mobilities and time-space strategies. Stabilini et al. (2013: 122) defines chronotope as inhabited place, where . . .urban space meets the temporality of social interaction, which is regulated by public action for economic purposes (working hours), for social purposes (enabling the meeting among

people and things) and for cultural purposes (local life traditions, marked in the historical and geographical features of the place)...'.

The conceptualization of urban timespace

Based on Crang's concept of the chronotope as a unique combination of a specific place and specific time, it is possible to perform a regionalization of urban space according to the nature of its temporality. Places may be understood as specifically timing space. Temporality of place may be conceived in keeping with the spirit of Lefebvre's polyrhythmicity, i.e. as a unique combination of various rhythms. The specific temporality of a selected location thus consists of different rhythms: long, short, synchronous, diachronous, individual, group, etc. According to this logic, all places may be described using a specific spectral composition of local rhythms and – likewise – urban space may be regionalized into areas with a similar rhythmical make-up, i.e. places with similar timing: particular chronotopes.

In addition to Crang's chronotope and Lefebvre's rhythm, the text also refers to the pacemaker concept. Pacemakers constitute collectively shared, often institutionalized and above all stable sources of particular rhythms. They include institutions, structures, technologies or activities that set the timing for a given urban environment (Hägerstrand, 1982; Mulíček et al., 2010; Parkes and Thrift, 1975). Italian experience, deeply embedded in the urban planning practice, highlights the capacity of working and school hours and institutionalized calendars to orchestrate individual lives (Mareggi, 2013). Paolucci (2001) points out that significance of urban pacemakers is not constant in time. The traditional timetables and 'obliged times' (Mareggi, 2013) are the subjects of gradual change linked to the changing role of particular pacemakers within societal timespace.

Pacemakers may be divided into two groups. The first type determines specific timespace points with which must be processed, i.e. either adapted to or contested. These include the beginning and end times of certain activities such as the beginning of working hours, train departures and film screenings, the end of the happy hour and the closing hours of businesses, offices and restaurants (see Lynch, 1972: 138–155). Such pacemakers are referred to as *clock-time pacemakers*. The second type expresses a certain minimal, typical or maximum duration of an activity. Such pacemakers are not bound by specific beginning and end times but are associated with the structuring of time into time units: socially delimited durations applicable to certain situations or activities – e.g. a fast food lunch requires a different temporal allocation than a business lunch at a restaurant. The duration of shopping sessions in various types of shops or the duration of meetings with different partners may be perceived in similar terms. The concept describes

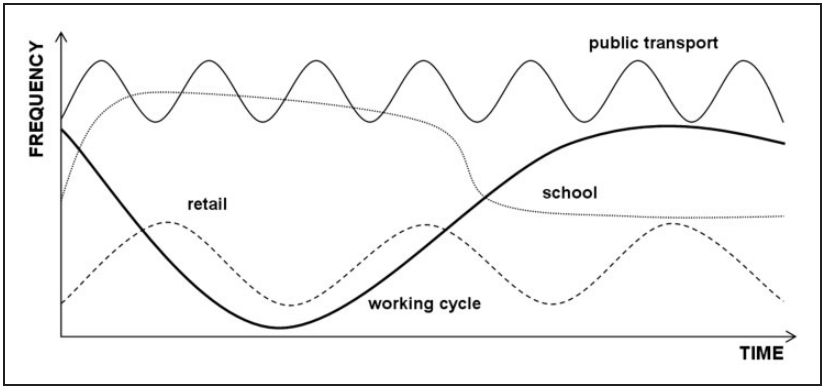

Figure 1. Schematic representation of the diffusion of various rhythmicities (polyrhythmicity) of a given place.

time using durations of certain activities, depicting the division of a day into units of variable situation durations; this is known as the *event-time pacemaker*. The event-time pacemaker thus facilitates the structuring of linear time into time units established on the basis of particular activities as well as the description of their typical length and subdivision into the individual components of an overall rhythm of a given place (Figure 1).

This text employs the *event-time pacemaker* concept, referring to the typical duration of activities. It will therefore not focus on the arrival times of public transportation in the studied locality, office opening times, shop closing times or when the sun goes down, but instead on the duration of the interval between two successive departures of public transportation, the duration of a typical shopping session, the duration of a stop light exchange or the average duration of any activity taking place in the studied locality.

The chronotope concept applied to the city of Brno

Individual pacemakers exhibit a scale-differentiated scope of activity. Particular places thus include local and supra-local as well as city and global rhythms and rhythms with a frequency measured in minutes, days or even years. Therefore, the empirical analysis presented here – conducted in the city of Brno (Czech Republic, approximately 400,000 inhabitants) – focuses on three selected examples of pacemakers which make up a variable scale polyrhythmic spectrum. The analysis of local-level rhythms (minute locality) targeted public transport while supra-local rhythms (hour quarter) were monitored in retail and the analysis of city-wide rhythms (day city)

focused on working time. The rhythms and pacemakers selected for detailed analysis constitute a mere sample of the immense set of hundreds of biological, social, economic, psychological, technological, climatic, astronomical and other rhythms and their resources which together form the polyrhythmicity of the everyday. Rather than providing a comprehensive description, the three selected pacemakers are designed to suggest different ways of thinking about the time of a place.

Local pacemaker: Public transport

Departures of public transport vehicles from stops in Brno were chosen as a source of rhythms at local timespace level (minute locality). The average interval between two successive departures of all accessible public transport modes (i.e. trams, trolleybuses and buses) was calculated for each stop for weekdays between 5:00 and 21:59. Due to entirely different system of public transport supply during the night in Brno the night period was excluded from the analysis. Timetables of Brno public transport valid in 2009 were used as a data source.

The interval between two successive departures structures the temporality of stops and their surroundings into time units which may determine, e.g. whether passengers look up departure times in advance or come to the stop not knowing when the next departure time is and how long they may have to wait for a connection, whether they run to catch a departing vehicle, study departure schedules or choose to walk instead of using public transportation. Departure intervals thus structure time into units of common experience which contribute to the overall rhythmicity/temporality of such places.

Several types of areas characterized by similar intervals between departing vehicles (ranging from less than 1 min to over 10 min) may be established on the basis of data depicted in Figure 2. The interpretation of the resulting spatial distribution is not important in terms of absolute geographic localization of the individual stops (local pacemakers) – rather, maps provide important information regarding the division of urban space into spatially relatively coherent territory types. When visualized on a map, differences between individual zones tend to be primarily quantitative in character – central areas show high-frequency of connections while areas situated on the outskirts generally feature lower frequencies. However, quantified differences may also be interpreted according to qualitative dissimilarities in rhythms in the immediate vicinity of individual stops. In the central parts of the city, a public transport stop is a permanent attractor of an increased number of people who may create disorganized and difficult to observe groups whose overall rhythm – grouping prior to the

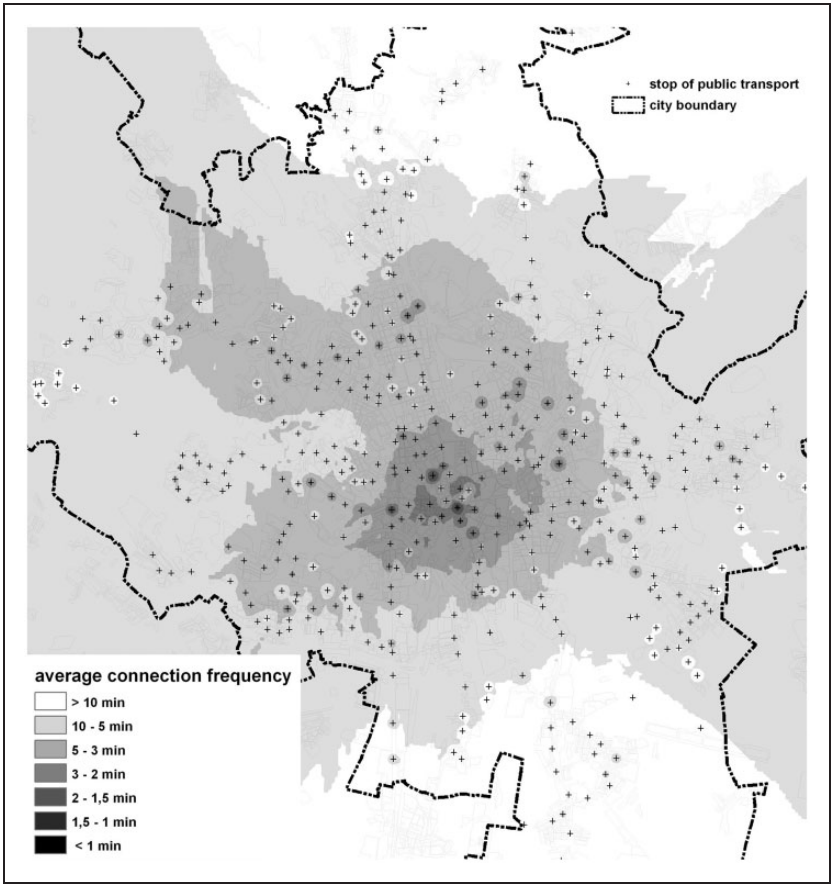

Figure 2. Map of connection frequencies at public transport stops in Brno.

arrival of the desired vehicle, dispersal following their leaving the vehicle, movements between platform edges, etc. – is not recognizable at first sight due to the large number of other overlapping rhythms (frequent arrival and departure of individual vehicles belonging to various lines). On the other hand, stops located in less frequented zones constitute pacemakers which are rather more clearly delimited in terms of presence/absence: people accumulate at the stop prior to the arrival of a vehicle, while the same space will be empty once it leaves. Although the logic of structuring time at stops with high and low frequencies remains the same, its reflection in the common routine of the users varies. Knowing that the vehicle is available on location no more than several times an hour is undoubtedly the unifying element of

individual rhythms in a clearly delimited group, since – in the case of a missed connection – the routines of its members could be severely disrupted. By contrast, localities with frequented stops are less prone to such disruptions, their influence on the rhythm of the daily routines of individuals is less significant and the relevant group of people thus less clearly defined.

In addition to the behavioural rhythmicity of individuals or groups of users, spatial differentiation of a given phenomenon may also be examined by tracing its impact on the creation of a given place. In such a case, there are no qualitative differences between areas with high- or low-frequency stops, as in both cases public transport only serves to structure time into units which differ merely in duration. Lefebvre derives the ability to identify a rhythm in the environment from its closeness – in terms of frequency – to the biological rhythms of the observer. In other words, the more similar the frequency of a given place is to the physiological rhythm of the observer, the easier it is for the observer to recognize (Lefebvre et al., 2004). Effective differences between 'low frequency' and 'high frequency' stops on the constitution of specific places are thus rather the outcome of the difficult observability of the effects of rhythms with longer frequencies than the result of differences in their respective logic.

Once again it is essential to state that public transport stops were selected only as an example of micropacemakers, which animate place on a local geographical scale. As a rule, individual local pacemakers do not act as independent entities but as an interconnected network of different conditionality types. Public transport stops thus reflect, transform and spatially transmit the effect of other pacemakers, e.g. schools, workplaces, various bureaus, etc.

Supra-local pacemaker: Retail

Retail represents the second type of pacemaker, which may be characterized as being broader in geographical scope and having longer temporal cycles. In comparison with the previous pacemaker, the *presence–absence* polarity is expressed in a non-aggregated temporal way at the level of individuals. Nevertheless, the retail unit may be perceived as an *event-time pacemaker*. The size of the grocery shopping area influences shopping duration and divides local time into a rhythm composed of units of similar duration. The rhythm established by this activity then functions as one of the spectral components contributing to the overall temporality of both the shop and its surroundings. Data on the duration of shopping sessions related to the shop sizes stem from the preparative field research conducted in Brno by authors. This research examined the average time needed by customers to make their shopping in different shop types with varying retail-floor size. Finally, the

information about the spatial and size distribution of shops in Brno was taken over from the study of city retail network realized by Masaryk University for the City of Brno (Mulíček and Osman, 2009).

Figure 3 indicates that smaller business units in Brno are generally located in the inner city and – to a lesser extent – in selected central parts of the outlying neighbourhoods. From an interpretative point of view, it may be interesting to consider the fact that the inner city is a relatively extensive area which may be characterized by a combination of fast rhythms derived from a high frequency of public transport connections as well as from high concentrations of small shops. The combination of smaller shops and frequently served bus stops works both as a sign and the

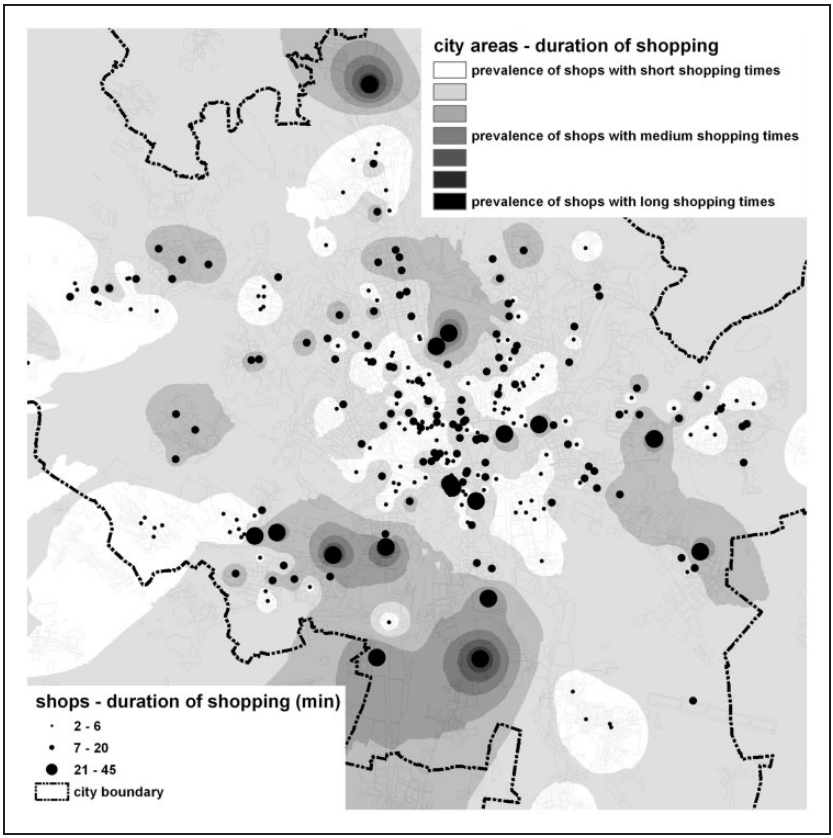

Figure 3. Map of model shopping durations according to retail floor in the city of Brno.

motive for a higher pulsation occurring in these parts of the city, especially in comparison with the outskirts. The city edge (especially near major shopping centres) offers another characteristic combination of pacemakers: long shopping intervals in large stores in conjunction with low-frequency public transport. However, although this combination does not lead to lower numbers of persons in the locality (many prefer cars to public transport), the duration of their stay (i.e. the arrival – departure rhythm in the scale of a shop) is much longer compared to the city centre. In addition, this tendency is emphasized by the fact that unlike small shops located in the city centre, large shopping centres are more prone to changes in weekly or seasonal rhythms. The *presence–absence* polarity is particularly significant when working days are contrasted with peak shopping periods such as Fridays/weekends and, e.g. pre-Christmas shopping. An analysis of the retail pacemaker effect provides interesting insight into the internal structure of the city, i.e. into the relationship between the physical and temporal structure. Retail serves as an example which clearly demonstrates its distinct temporality in various parts of the city: specific retail timespaces – chronotopes. The inner city constitutes a compact built-up area consisting of streets organized into blocks with every bit of space a valuable commodity, small shops, expensive offices, luxury hotels, etc. The concentration of everything is high and time units are short. On the other hand, the physical structure of the city edge is loose and adapted to motorized transport: distances are longer, speed higher, premises cheaper, projects larger and time units longer in duration. In Brno, shops with the most extensive sales areas, which basically prevent customers from carrying out their purchases within an interval shorter than 30 min, are located outside of the built-up area and are thus inaccessible to pedestrians and to the internal rhythm of the inner city as such. While the temporal organization of inner city retail is derived primarily from the daily rhythm (daily inner city), the organization of retail on the outskirts stems from a weekly rhythm (weekly outer city). A possible correlation between the physical structure of space and its temporal organization may be assumed not only in the case of the example suggested above (retail) but also on a more general level as applicable to any timespace – chronotope.

Citywide pacemaker: Daily work cycle

The third group of analyzed rhythms includes rhythms whose frequency and spatial differentiation are primarily derived from people's presence or absence conditioned by their employment patterns. In order to describe such rhythms, it is essential to acquire an empirical knowledge of the

prevailing functions of each urban district in the city of Brno. This knowledge is based on census 2001 data enabling calculate the population size and the number of jobs in their sectoral structure for each urban district. Thus, in case a given district is primarily residential (i.e. its share on total population of Brno is higher than its share on the total number of jobs), its rhythm is determined by the morning departure of a large number of employed persons (evacuation) and their subsequent return in the afternoon (invasion). In case the predominant function of a district is work-related (i.e. its share on the total number of jobs is higher than its share on population of the whole Brno, in this case it is even possible to distinguish between districts with dominance of jobs in industry and districts where tertiary jobs prevail), the rhythm of that district will include an invasion in the morning and a subsequent evacuation in the afternoon – it is the temporal complement of residential districts. On this scale level (daily city), it is not easy to provide an example of a pacemaker analogical to the logic employed in the two above mentioned cases, as the daily work cycle combines the logic of both defined pacemakers (*clock-time*, *event-time*). In order to assign a specific type temporality to individual urban districts with specific functional uses, it is essential to consider both the duration of the inhabitants' presence/absence (*event-time pacemaker*) and the specific times when the locality is abandoned/occupied (*clock-time pacemaker*). The day constitutes a time unit so extensive that it requires the application of a more synthetic pacemaker and to take into account attributes such as evacuation speed, invasion rate or current population structure. The various types of defined daily cycles are presented in Figure 4: situation A depicts an environment with a dominant work function, situation B depicts a primarily service-oriented district, situation C depicts a residential district and situation D is valid for a district featuring a combination of residential and employment/mixed functions.

Geographical distribution of the predominant features of individual urban districts in city of Brno is shown in Figure 5. With respect to the rhythmanalysis of the *presence–absence* of people throughout the day, town planning districts with overlapping working and residential functions are particularly interesting: such places are populated both during the day and night, albeit by different groups. In Brno, such areas are found primarily in the inner city. Their pulsating rhythms – influenced by, e.g. the intensity of public transport and concentration of retail units – are emphasized by the presence of large numbers of incoming and departing people. On the other hand, the rhythms of mono-functional urban districts (districts with dominant residential or industrial functions) are characterized by relatively long evacuation periods and thus by lower frequencies in comparison with the inner city.

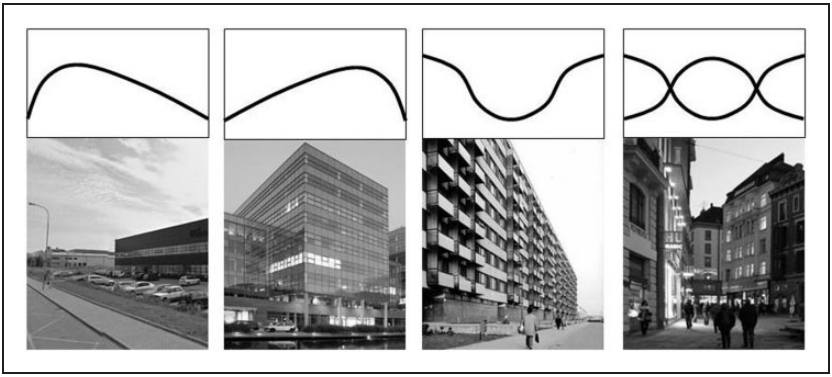

Figure 4. Schematic representation of the effects of daily cycles on inhabitants' presence–absence (from left to right order of situations: A, B, C and D).

An analysis of the rhythmical influences of public transport, shopping duration and the dominant features of individual urban districts has facilitated the identification of places with a specific temporality or specific spectral rhythmical make-up. The analyses described here indicate and confirm further research potential. However, even at this early research stage, it is clear that temporalities determined in accordance with pacemakers established at various levels have at least some potential to positively function in certain areas and ultimately create an interdependent temporality. The assumption that spectral rhythmanalysis may lead to the identification of specific urban chronotopes thus appears to be justified.

Overview of housing rhythms encountered in the residential quarter of Brno–Lesná

The large housing estate in Brno (Brno–Lesná) has been selected in order to present a simplified overview of the utilization of the above suggested analytical concept – disintegration of the temporality of place into selected rhythms according to selected pacemakers. The following text is based on the field research (observation of temporal characteristics) conducted by the authors in the selected district. To be more precise, the analyzed situation corresponds to the state of locality on a sunny summer holiday.

The inner part of Brno–Lesná district lacks transit traffic and there are no busy streets. Transportation to the district is provided by trams to some degree, although bus and car traffic is prevalent. With the sole exception to the terminal tram station, public transport stops are located only along a street encircling the district; two stops have a transfer function (1 bus,

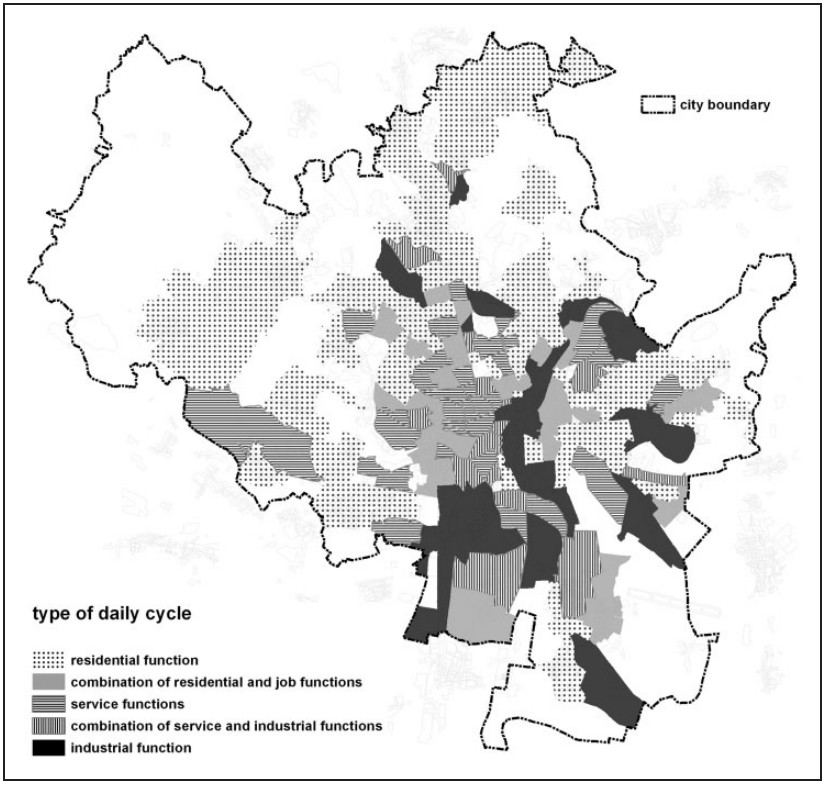

Figure 5. Map of the dominating functions of individual urban districts in the city of Brno.

1 combined) and are situated next to the only two shopping centres in the entire locality. Both include supermarkets complete with grocery stores, bakeries, confectioneries, restaurants and tobacconists. The adjacent areas include a health centre, several sports centres, office buildings, a post office, a petrol station, a chapel and several primary schools and kindergartens. The entire area may be unambiguously considered residential and exhibits both a rapid morning evacuation and a subsequent gradual afternoon invasion.

The morning departure primarily occurs between 6:30 and 9:00. During the evacuation period, the locality is populated almost exclusively by individuals going to public transport stops; their movements are confined to a relatively limited number of corridors and are easily observable, predictable and systematic. After 9:00, the size of departing flow begins to correspond to the arrivals, with a number of types of people staring to appear after

10:00: children, mothers with strollers, workmen, people cleaning/loading cars and cutting grass and people lounging about and sitting in outdoor restaurant sections. There is an increase in various outdoor activities and also a shift in the pattern, which becomes less organized and systematic: movements become more chaotic. After 11:00 the first homeless people appear in the immediate proximity of shops. The space becomes very calm and the movement of people is slow and unhurried – the number of people and cars eventually plummets and the area is mostly empty at around 11:30. It is worth noting that although the area in question includes seven restaurants, none of them provide set lunch menus; moreover, the selection of meals on offer tends to be very limited. Restaurants in neighbouring localities generally experience peak lunch hours between 11:00 and 11:30. Approximately 1 h after lunch, groups of two or three people as well as larger groups begin to appear. The afternoon – up until the beginning of the invasion of the working inhabitants – includes the most chaotic movements of the day, with people engaged in a great variety of disparate activities; no two people seem to be making the same movements. The two local shopping centres are most active once people return from work, i.e. between 14:30 and 17:00. In comparison with the morning routine, people tend to choose different routes from public transport stops; in addition, movements are slower on the return trip – the final destination is the goal and subsequent time is no longer structured according to institutional commitments, it is leisure time according to personal rhythms. A relatively low number of people are waiting to depart from public transport stops, those arriving leave the stop immediately. Although the space around shops adjacent to bus stops clears out after 17:00, the shopping centre next to the tram stop remains quite lively. Rows of shopping carts in front of the individual stores are at their shortest, while restaurant garden sections tend to be rather full. The first batch of small shops close after 17:00: bakeries, newsagents, pet stores. The space gradually calms down. A significant change takes place around 20:00 with the last of the shops closing, dark falling, street lamps lighting up and most people leaving the restaurant gardens.

Significant differences between bus and tram stops are distinguishable during the day. As trams run throughout the day at short intervals, the comings and goings of people are difficult to assign to specific departure times (tram stops fill continuously once a tram leaves the platform). On the other hand, the departures of bus lines are observed with greater interest with some people waiting for extended period of time and others checking the time before entering the stop area. The two shopping centres – and especially the grocery stores located therein – constitute the most popular shopping destinations. Average purchase intervals exceed 10 min and minimum purchase duration oscillates between 2 and 5 min. The relatively

longer purchase intervals correspond to the overall structure of the district, i.e. extensive open spaces with large apartment buildings, oversized public spaces, wide streets and significant distances.

Conclusion

This paper briefly introduces the possible pitfalls arising from the linking of various concepts of time and space in the social sciences. The chronotope, rhythm and pacemaker concepts, introduced at the outset, are subsequently used to describe the specific temporality of a particular place, perceived as a spectral image of overlapping rhythms (polyrhythmicity) generated by various pacemakers. The temporality of a place is initially subdivided into individual rhythms, which are analyzed separately and subsequently reassembled into a complex temporal image. The empirical part of the text provides such an analysis, citing the city of Brno as an example. The analysis itself is based on three selected rhythms differing in scale (public transport, retail and the daily work cycle) – their combined effects are described in the final passage in connection with one particular place (Brno–Lesná district). The article thus presents the empirical utilization of rhythm in the description, analysis and regionalization of urban space.

Rhythm stands out among other attributes of place, more frequently used in classic urban studies. Indicators of absolute or relative position, functional use or social status are usually considered as temporally and spatially fixed, reduced to invariable place attributes. Rhythms, however, cannot be reduced in such a way – although they are spatially fixed on a certain geographical scale, they themselves represent a temporal scale. The range of daily, weekly or annual rhythms therefore constitutes an analogy of urban regionalization; however, this regionalization is a temporal one. While a spatial region is defined by a set of places which are formally similar or functionally interconnected, rhythms create boundaries in the realm of linear time. Unlike the concept of region, which presupposes the parallel existence of other regions outside its borders, the concept of rhythm does not assume any 'parallel worlds of activities' but – in a continuous flow of time – arranges them into an continually (though variably) developing loop.

On the other hand, the concepts of region and rhythm are closely associated: the temporal essence of rhythm is intertwined with the spatial aspect thanks to the urban activities and processes themselves. In view of the above considerations, the search for a suitable tool for the integrated analysis of space and time has resulted in the adoption of the chronotope concept, which – above all – facilitates a comprehensive regionalization of urban space. The structuring of time into repetitive rhythms with specific spectra is spatially fixed, i.e. the expression of various combinations of

local, supra-local and citywide pacemakers typically occurring in certain locations may be used to define component timespace sub-units within a defined urban organism, i.e. individual chronotopes. The chronotopic approach to the structuring of timespace is essentially based on the description and analysis of cyclical change. Change – most frequently determined by alternating states of presence and absence of individuals and associated processes and activities – serves to animate the urban place. Unlike the prevailing concept of place as something static (i.e. unchanging in time), the animated place reflects the everyday-urban reality in a much more convincing manner.

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Time–space rhythms of the city—The industrial and postindustrial Brno

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Abstract

This paper examines the transformation of the postindustrial city in terms of its temporal structure. It takes concepts of time geography, routine, and rhythmicity of the classic Lund school, Lefebvre's analysis of rhythms, and Crang's geographic application of the chronotope concept as its starting points. Analyzing changes in the city bus transport services in Brno between 1989 and 2009, the paper attempts to capture in empirical terms the onset of the postindustrial phase of the city's development. While temporality of an industrial city can be characterized by a shared rhythm determined by a small number of dominant pacemakers (industrial plants), the deindustrialized city is associated with a significant weakening of such pacemakers cutting across the society and thus with a distinctive individualization of urban rhythmicity.

Keywords

Rhythm, pacemaker, postindustrial city, Brno, public transport

Introduction

This paper presupposes that in geographical research, the city as well as any urban place should be defined not only by its spatial attributes but also through its affiliation to a particular spatiotemporal system. To be more precise, the aim of the paper is to examine changes occurring in the city temporal structures between its two distinct developmental phases—industrial and postindustrial. Therefore, the directly connected concepts of time geography, namely cyclical time, rhythm and rhythmicity, pacemakers, and also the summarizing concept of chronotope are discussed in detail in the opening theoretical section of the paper. These concepts are then applied in the empirical part, which is based on the premise that the changing temporality related to the transition from the industrial to the postindustrial city is illustratively demonstrated by the way of public bus transport frequency–rhythms conversion easily detectable from its timetables. It is supposed there is a strong relationship between the societal demand for public transport service at certain times and places, and the adaptation of the bus transport system to these demands. Temporal changes in the availability of public transport services between 1989 and 2009

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are in this paper described on the example of the city of Brno, the results of the analysis document that the industrial Brno represents a chronotope differing in terms of space–time organization from the chronotope of the postindustrial Brno.

Urban rhythmicities

The geographical discourse conceptualizes city space as a fluid medium or context for a number of processes and phenomena, some of which lead to the creation or transformation of materialized or nonmaterialized urban structures. A large number of urban structures arise from repetitive activities, i.e. processes repeated within a specific time interval—it is actually repetition or rhythmization of processes that is often the key factor in the materialization process in the urban tissue, an imperative for a process to be imprinted into the physical or functional structure of the city. The idea of repetitive activities brings in the dimension of cyclical time, a perspective not very common in geographical research. Cyclical time is characterized by binding sequences of activities into integrated units that serve as periodically repeated building blocks of daily, monthly, or annual cycles of routines. The primary focus within the context of this paper is, therefore, on city rhythms as drawn e.g. by Lefebvre et al. (1996) or Crang (2005: 206):

> In other words, our daily lives have a temporality that is often not the linear flow of time's arrow but is composed of cycles. Getting up, going to work, eating meals, weekdays and weekends all occur with stupendous regularity when we look at Western societies. On longer scales there are the cycles of birthdays and festivals. In other words ritual times, be they religious, personal, commercial or mixture of all of these, are often cyclical.

Rhythms, specifically urban rhythms, are essentially linked to specific places as their constitutive polarities (presence and absence, movement, and pause) are predominantly linked to spatially localized entities, objects, and processes. The concept of rhythmicity as a process-oriented conceptual tool thus allows depicting the key feature of time in space—its internal polarity. Cyclical repetition of routine processes therefore links specific places or types of places into a single space–time. City, as well as any (urban) place can thus be defined not only by its spatial attributes but also through its affiliation to a particular spatiotemporal system. Yet, this topic has been somewhat neglected in geographic research of cities, especially in favor of analyses of functional characteristics of urban places. However, the mosaic of the functional characteristics of individual places that captures the complex spatial pattern of the city is not quite complete without the temporal dimension of the city. Knowing the time coordinates of functions of each specific place allows a more detailed geographic description and interpretation; it allows linking places and their functions not only within space but also within time. Analyzing the spatiality and temporality of particular places within the city, one can identify and highlight the dominant rhythms orchestrating the city and integrating the urban places into a coherent spatiotemporal system.

To be more precise, the use of a rhythm can be perceived as a conceptualization not completely denying but rather complementing the idea of linearly flowing time. Crang (2005: 206) talks about "stupendous regularity" of many activities in daily lives accenting the cyclical nature of lived time (Henriques et al., 2014). On the other hand, he also sees how the mechanical linear time of modern society interferes and intertwines with daily or seasonal repetitions. In Lefebvre's view, the unity or reciprocity of the cyclical and linear time constitutes the measure of time; linear and cyclical times measure themselves one against the other (Lefebvre, 2004: 8). In this sense, the empirical part of this paper treats public transport schedules as a representation of urban cyclical time; however, the changes in the

schedules between 1989 and 2009 also define the linear time flow, i.e. the one-way urban development and transition from the industrial to the postindustrial era.

Chronotope

As urban rhythms are still not a common dimension of urban research methodologies, there is a very limited range of operational concepts enabling space–time integration. One of the options to overcome this duality is the chronotope concept, first introduced within the field of the social sciences, namely the literary criticism, by Mikhail Bakhtin. He considers the existence of certain entities in mutuality, i.e. in relations with other entities: in his view, time and space, among many other examples, are not perceived as mutually exclusive, but rather as one element incorporating the latter. It is thus inevitably impossible to study place without time and time without place, as these entities are evidently inseparable (Bakhtin, 1980, 2002; for more detailed interpretation of Bakhtin's approach see Mulíček et al., 2015).

Although in geography, the chronotope was first applied by Folch-Serra (1990), its most developed theorization is connected to Mike Crang. Crang (2005: 214) introduces this concept as a unique combination of a specific temporality and a specific place—a place can be perceived as a spatially bounded constellation of rhythms, always beating, circulating, and becoming.

> A multiplicity of temporalities, some long run, some short term, some frequent, some rare, some collective, some personal, some large-scale, some hardly noticed—the urban place or site is composed and characterised through patterns of these multiple beats. (Crang, 2001: 189–190)

The concept of chronotope thus refers to places perceived as polyrhythmias (Lefebvre, 2004). Similarly Schwanen et al. (2012) view a particular urban place as a locus of entrainment processes shaping, modulating, and synchronizing rhythms coming from particular sources. The place-based entrainment emerges as an interplay between local settings and incoming rhythms. Internal rhythmicities of numerous urban entities including institutions, standards, and technologies can be relevant, considering their impact on urban temporality. The organization of public transport or the opening hours of retail premises and public institutions are just a few examples of systems transmitting their internal beats to other urban entities and places.

There are no scale limitations to chronotope applicability—a small square animated a few times a day by the arrival of a bus is just as typical representative of a ''quiet neighbourhood'' chronotope as an urban agglomeration flooded by crowds of factory workers on workday mornings is of an industrial city chronotope. Albeit there is a plurality of possible temporal and spatial scales, the chronotope conceptualization meets particularly with the time–spaces of everydayness. Everyday spatialization of urban rhythms (or timing of urban places) inscribes deeply into physical as well as institutional urban structures and the chronotopic approach seems to be helpful in exposing not only the ''graphic visibility'' of an urban place but also its ''narrative context'' (Holloway and Kneale, 2000; Simonsen, 2004). This approach has inspired us to consider the possibility of using data from public bus transport timetables valid in Brno in 1989 and 2009 as the base for a spectral analysis of the chronotopes of the industrial and the postindustrial city.

Pacemakers

The concept of chronotope is deeply related to the concept of pacemaker introduced by Parkes and Thrift. These authors describe pacemakers as temporal and spatial points serving

as sources of reality timing. In other words, pacemakers are collectively recognized, often institutionalized, and especially solid rhythms indicators. They consider family, with its shared rhythms of eating, sleeping, and other family rituals, a very strong pacemaker (Parkes and Thrift, 1975).

The concept of pacemaker was adopted by Hägerstrand (1982), however, he preferred the term pacesetter, as this word expresses better the ticking of a metronome as an appropriate symbol of timing source. Hägerstrand presented its particular application, using the example of a locality, where he spent his childhood, namely a valley in the wooded part of southern Sweden. The author portrays the role pacesetters play in the uniformly established times of the beginnings and the ends of important and often institutionalized bundles of activities. Entities like the foundry (the Bruk), the school, the railway, the church, and milking cows provide the local residents with specific spatiotemporal markers indicating when, where, and for how long they are supposed to be, thus significantly structuring their days, while also structuring the day of the entire local community by virtue of their generally recognized validity (Hägerstrand, 1982).

Shapcott and Steadman (1978) observe partially different pacemakers using the example of a medium-sized city of Reading in southern Britain. Besides the most frequently mentioned fixation of working hours, they mention school hours, office hours, and opening hours of shops, restaurants, pubs, cinemas, and sports facilities, noting also the importance of the TV program, public transport timetables, or legally restricted opening hours of certain services. In comparison with Hägerstrand's approach, there is a significant increase in the number of primarily consumer-oriented pacemakers. However, any increase in the number of key pacemakers necessarily causes a reduction in their relative importance, and moreover, their internal conversion can also be identified. The extended opening hours of shops, restaurants, casinos, sports facilities, cinemas, and petrol stations, where a wider and wider variety of services is offered 24 hours a day, had caused that their availability became independent of specific times. The boom in private transportation at the expense of public transport, online purchasing, fast-food, and variable work schedule represent just a few of the many other symptoms of the ongoing conflict between the traditional pacemakers widely shared by the society and the emerging individualization of everyday urban life. It means a growing share of urban population is able to shape individually their daily space–time routines without subordinating them to the commonly shared space–time regime.

It is exactly the ability of ''narrative contextualization'' (Holloway and Kneale, 2000; Simonsen, 2004), what makes the concepts of chronotope and pacemaker so helpful in documenting urban transitions, specifically the transition from the industrial to the postindustrial city in our case. The city can be conceptualized here as a large-scale chronotope, an urbanized place animated, and ''narrated'' by a set of pacemakers and their rhythms. The postindustrial transition itself will then be manifested by a decline of the existing traditional industrial pacemakers and the onset of new ones—producing new rhythms, defining a new all-city chronotope and a new everyday story of the city (Crespi, 2014).

Rhythms of the industrial and the postindustrial city

The transition from the industrial to the postindustrial stage, especially in case of traditional industrial cities, is associated not only with shifts in relative importance of the individual sectors of the local economy, but also, and above all, with the deep institutional and cultural impact of this process. Byrne (2002) argues that within the context of the industrial city, the application of the term ''industrial'' must not be limited to the sphere of production.

According to Byrne, "industrialism" is the way industrial cities operate and are organized; it is deeply rooted and to a different extent often persists even in the postindustrial stage of their development. Industrial production in cities played not only the role of a system of economic production, it also served as a system for social reproduction and for generating cultural forms. The way the industrial city was organized socially was significantly linked to the distribution of shared resources, often in a close connection to industrial production (Henriques et al., 2014). The industrial society, with the work culture at its center, clashes during the transformation period with the postindustrial city, which produces new privileged groups of citizens and new preferred themes, as well as new cultural forms (Cudny, 2014).

If the differences between the industrial and the postindustrial city are to be measured through the lens of cyclical time and rhythms, it is necessary to identify the organizational principles and important agents of the organization of everyday life for each of the two types of city development discussed in this paper. The existence of a relationship between the time regime of individuals or the whole society and the general political and economic structure is a general prerequisite for this discussion (Gershuny, 2000). In the case of the industrial city, the distinct city-forming factor was its industrial production. Some authors (e.g., Pavlínek and Smith, 1998) speak of industrial paternalism resulting from the strong links between the production and governance spheres and from the key position the major industrial plants had within the area of collective consumption resources distribution (housing, health care services, preschool services, transport). Industrial enterprises were thus the dominating elements in the spatiotemporal organization of the industrial city environment.

Some authors employ metaphors comparing the industrial space–time system to a kind of machine. They draw a picture of human/natural rhythms controlled by mechanical rhythmicalities (Stavrides, 2013) and depict the work schedules as engines of the town machine producing relatively simple rhythms balancing work and life, obligations, and entertainment (Paolucci, 2001). The industrial city chronotope dominated by rather uniform factory beats can be described then much more as eurhythmia (Laban, 2014) or isorhythmia (Lefebvre, 2004), the state of place-based rhythmical unification.

In contrast to this, no simple list of dominant rhythms can define the space–time of the emerging postindustrial city. The working hours of companies, diversified by their sectors of interest, size, and location, comprise a mosaic of overlapping activities filling most of the day without any apparent order. The value of time as a measure of work performance gets diminished in favor of other indicators. Consumer activities gradually erode the role of production as the main city-forming factor—the process manifests itself mainly by the fading differences between workdays and weekend days on the spatiotemporal level; retail services are a function that is less and less time bound, providing a bridge between the originally clearly separated working days and rest days (Kunc et al., 2012; Maryáš et al., 2014).

Although the rhythms of the postindustrial city are much less pronounced compared to the synchrony of the industrial city era, the connections between "...social reproduction, the structuring of time and construction of space are at least as strong as in industrial society" (Paolucci, 2001: 648). The fact is that the scale of the rhythmization of urban activities shifts—the unambiguous citywide spatiotemporal rhythms disintegrate into a large set of space–time routines characterizing individual groups of urban population that can be discerned in the system of dimensions corresponding to their varying professional, age, social, or consumer status (Boulin 2006: 197–198). The reduction in the significance of shared pacemakers of the mechanical age, which is often associated with the postindustrial period and which expands the range of available choices and the sense of personal freedom also increases the complexity of life situations, forcing individuals to keep

making decisions while holding them more responsible for their decisions at the same time. Stavrides (2013: 37, 41) speaks about rehumanizing the city-machine rhythms and comments on the changing spatiality of time in the postindustrial city:

> It is not that the rhythmicalities of the modern metropolis have ceased to exist. It is that such rhythmicalities are now increasingly organized and separated into distinct urban settings, and defined as characteristic of those settings, rather than existing as part of an intense, machine-centred production of overarching urban rhythms. Contemporary urban rhythms appear as enclave-bound rhythms... If the industrial modern city was the generator and locus of alienating mechanical rhythms, contemporary post-industrial cities seem to generate and sustain localized, site specific rhythms.

It seems that consumption in its wider definition becomes the new organizing principle in the postindustrial urban space–time replacing industrial activities that fade into insignificance. Kärrholm (2009) considers (maybe too strictly) consumption the last public activity introducing generally recognizable rhythms into the urban landscape. In conformity with Stavrides, he associates new consumption-based synchronicities of the postindustrial city with the processes of urban reterritorialization. Retail activities, according to Kärrholm, seize control over the traditional temporalities of particular public urban places, privatize their rhythms, and incorporate them into a territorial mosaic. Bromley et al. (2003) or Schwanen et al. (2012) give some empirical evidence on these processes of time-based territorialization when describing the emergence of nighttime economy localities and their multilayered rhythms.

Returning to the rhythmicity of the industrial city with its small number of key socially shared pacemakers and its significant contribution toward structuring the city, it is much easier to speak about a single common time, rhythm, routine, which—through its daily repetition—becomes an integral part of the city. In the case of the postindustrial city, there is a trend of significant individualization of one's time budgets, which, however, tend to strictly repeat, become routinized. In this case, then, a single time and rhythm of a place will not do, instead a higher number of times and rhythms and their internal diversity (chronotope) must be considered. The routinized activities of individuals in their various forms thus compose the postindustrial city through circulation, combination, and recombination in principally the same way as the shared rhythms induced by communally shared pacemakers compose the industrial city. Within the framework of the individual ideas of the abovementioned authors, a postindustrial place–city thus can be described as polyrhythmic (Lefebvre et al., 1996) or kakorhythmic (Laban, 2014) and its various rhythms can be viewed as its dialectical parts.

Case study context

This paper aims to document the transition from the industrial to the postindustrial city stage assuming that the industrial city, as a distinct chronotope, differs in terms of space–time organization from the postindustrial chronotope. The characteristic rhythmicity of everyday industrial life linked to a small group of dominant pacemakers and the gradual disruption of the clear rhythm of an industrial city caused by the economic and social change that has been in progress since the 1990s is illustrated on the specific example of Brno, a Czech city with approximately 400,000 citizens and a long industrial tradition.

In the particular case of Brno, the way to the modern industrial capitalist system was taken up in the second half of the 18th century when the textile industry boom triggered the long-lasting industrial town era. In the year 1869, nearly one-third of the 75,000 inhabitants

was employed in industry and Brno ranked among largest production centers in Austro-Hungarian Empire. The industrial character of the city was even deepened during the postwar period after 1945. The Brno industrial plants became a part of the centrally controlled economy system in socialist Czechoslovakia. At that time, the share of industrial workers in total population of Brno (30%) significantly exceeded national average. In accordance with Enyedi's remark on socialist effort to rationalize investments through their concentration (Enyedi, 1996), the industrial production in Brno was concentrated into large production complexes. Four largest machinery plants employed two-thirds of the blue-collar workers in the mid-1960s and still more than one-third of all employees in the city by the end of the 1980s (Kunc, 1999). Nearly one-fourth of the 100,000 industrial workers in Brno in the late 1980s commuted to their work from the settlements in wider functional region of the city.

For a significant number of people employed in the industry, the everyday pace of a working day was thus set by factory working hours starting at 6.00 a.m. and ending at 2.30 p.m. Such early beginnings of working hours persisted as a kind of relict for the entire socialist period—they echoed 19th-century extended industrial work shifts as well as specific institutional timing of the former Austro-Hungarian Empire. These times were also highly accepted by many industrial workers commuting from rural settlements as they were able to combine their industrial employment in the city with local small-scale agricultural activities. The outlined anchoring rhythm was then transferred to other systems connecting the places of residence, work, and consumption into a coherent spatiotemporal complex covering not only the city itself but also the commuting area. Public transport timetables, opening hours of kindergartens and nurseries, or surgery hours of medical facilities are examples of nonindustry functions synchronized to some extent with the standard working hours, which secondarily created specifically rhythmic space–time for subjects with no direct ties to industrial plants. The space–time of the industrial city thus involved powerful mechanisms of self-reproduction, i.e. spatial diffusion of its rhythms across the urban space.

The development trajectory of the city of Brno after 1989 was substantially affected by the collapse of the centrally controlled system and the introduction of free-market economy. Deindustrialization processes accompanied by the growth of the tertiary sector were the most visible symptoms of that political and economic transition. The city functioning and development became more autonomous. There was a decline of large-scale industry in Brno; the multiple rounds of postsocialist investments created new production patterns withdrawing industrial production from its traditional production places and times and diminishing its privileged influence on the city's everydayness. Tertiary sector got the major share of total employment as early as in 1991 with retail and later also research and development activities that had emerged as the main markers of the postindustrial transition.

Analysis of the changes in the overall supply of city bus service in Brno between 1989 and 2009

Changes associated with the period of the postindustrial urban economy are most often examined through the prism of economics. But descriptions of sector changes and characteristics of tertiarization and deindustrialization only seldom manage to account for the disappearance of industrialism from routine activities of everyday city life. If attention is, however, paid to changes in rhythms, the impacts of postindustrialism on the daily functioning of the city become more apparent. For this reason, this paper captures the

onset of the postindustrial phase of city development empirically through the analysis of changes in the supply of public transport bus services in Brno between 1989 and 2009. The empirical analysis will focus on everyday rhythms passing over the seasonal or annual rhythms in this particular case.

Commenting the modes of urban synchronization Kärrholm says: "As a case of synchronising one could, for example, study how the timetables of busses are adjusted to the schedules of schools, work hours or the opening times of stores at weekends" (Kärrholm, 2009: 423). It is clear that different places within the city are mutually integrated via a very high number of relational systems producing and representing a certain level of isorhythmia. Public transport is only one of these systems; however, it is one which very eloquently illustrates the significant space–time routines and their changes within two decades of urban development in the context of the presented research at a physical level.

The basic premise of this paper is therefore the existence of a relationship between the societal demands for public transport service at certain times and places and adaptation of the public transport system to these demands (Docherty et al., 2008; Marada and Květoň, 2010; Turton and Knowles, 1998). It is necessary to clarify this premise in more detail. We must emphasize that the demand for public transport service in specific destinations and at specific times is not the sole criterion considered in the development of timetables. There are other factors that affect the scheduling of individual routes and the time-spatial pattern of the entire public transport system. Leaving aside the aspects of the public budget, the factors include primarily the overall structure of the transport market and the market shares of different mobility modes. During the communist regime, the position of public transport became very strong because of the relatively low level of automobilization. There were just 175 passenger cars per 10 inhabitants in the Czech Republic in 1980 and not more than 233 in 1990 (Kraft, 2012: 57). The situation has changed significantly since 1989; however, the importance of public transport within the Brno transportation system is still high—62% of people who live or work in Brno use public transport for their journeys regularly (PPMF, 2012: 7). As the public transport system is the key agent of urban mobility both in the industrial and the postindustrial Brno, its relevance in terms of politics and planning has been always considerably high. Especially socialist planners perceived public transport as a vital component of the centrally planned economy—it had to provide for and guarantee the everyday flows of workforce between housing and job opportunities often unequally spatially distributed within the territories of cities and urban regions (Musil, 2002). The development of timetables and routes scheduling were fully adapted to these normative planning goals among which the accessibility of large industrial plants was of the highest priority. As for the bus transport, the socialist urban planners took advantage of its spatial flexibility (compared to tramways or trolleybuses) to link relatively fixed industrial premises with newly constructed housing estates. Brno Public Transport Company (DPMB, 1989: 38, 44) defined then the role of the bus transport within the city transport system as follows: "Buses are becoming an efficient transport system dedicated to provisioning transport services for big industrial factories and large residential areas; ...(This system) is especially important at the times when new large housing estates are being constructed as it can be adjusted operatively to the processes of progressive urbanization." The same publication documents the fact that on many bus routes at that time, the intervals between services were based on the agreement with served factories (DPMB, 1989: 38, 44).

Nowadays, the industrial factories are not as important destinations within the city environment, at least as a consequence of the deindustrialization of the Brno economy; also the political regime is clearly different than in 1989, but the effort to serve the city area effectively by the public transport is still persistent. The buses are still operated as a

flexible component of the public transport system spatially and temporarily adaptable to changing demand (CITYPLAN, 2012), less dependent on the transport infrastructure, and capable to reflect both the ongoing transformation of spatial relations in the city of Brno and the changing temporal life rhythms of its residents.

As mentioned above, the greater spatial and temporal flexibility of bus transport was the principal reason for its use as a base for the analysis of the everyday rhythm change between the industrial and the postindustrial Brno. Neither tramways nor trolleybuses were used for this purpose, despite the fact they comprise a substantial part of the city's public transport network. Both are, however, less flexible than bus transport, and therefore less valuable for the aim of this paper. It does not mean they are completely locked in a stable, unchanging state, nevertheless, the development of their networks such as the construction of new branch lines or reorganization of their timetables is inevitably a longer and more difficult process. In fact, many new tramlines connecting new housing estates were built in Brno during 1970s and 1980s, in the form of the light rail, although a majority of them were finished later, in some cases 5 or even 10 years after the completion of the particular housing estate itself (Prokeš, 1979). These newly emerging links between residential and industrial areas within Brno were, at least in the first years of their existence, serviced by the flexible bus transport, on which we, therefore, focus in our empirical analysis.

Assuming the existence of a relationship between the societal demand for public transport service at certain times and places, and the adaptation of the public transport system to this demand, the analysis of rhythmicity of public transport and especially its changes over the reviewed period can be used to assess the status and change of the city's daily rhythm. Obviously there is a kind of dialectic relationship between transit system patterns and the socioeconomic structuration of the city. The public transport system is a clear driver shaping everyday routine of individuals and at the same time it is being shaped by the demand based on the routines aggregated on the scale of the whole city. Having in mind its dual, scale-dependent position of the public transit, we accent here the ability of the bus transport system to adopt and represent the rhythmicity shifts stemming from changing socioeconomic context.

As a whole, the supply of public transport bus service in Brno has not changed very much since the late 1980s—the number of routes and connections operating on weekdays and Saturdays has remained more or less the same (for more details see Table 1). A quite substantial change occurred, however, in terms of distribution of bus connections in the course of the day—a hypothesis, based on the data shown in the chart in Figure 1, can be formulated about the transformation of temporal rhythms in Brno, which is easier to discern by considering weekdays and not so easy to discern by looking at weekends.

The distribution of bus connections available on working days in 2009 shows two main differences compared with the bus services available at the end of the 1980s (for more details, see Figure 1). Firstly, a greater uniformity in supply of bus services during the day is particularly noticeable in 2009, i.e. the difference between the number of bus connections operating during the morning and afternoon peak hours compared to the morning off-peak period is smaller (the peak values exceeded 200 bus connections per hour in 1989, while the traffic intensity decreased to 75 bus connections per hour in the off-peak period; analogous data for 2010 show approximately 175 bus connections at the peak hours versus 100 bus connections in the off-peak period). The other major difference is the shift of the morning and afternoon peak into later hours—in 1989, the morning peak hour culminated between 5 a.m. and 6 a.m. (so that workers employed in the industrial factories could get to work by 6 a.m.—from all Brno districts), while in 2009, there is a distinct peak at about 2 hours later, i.e. between 7 a.m. and 8 a.m. due to the transition of a large portion of the workforce into

Table 1. Brno public transport bus services in 1989 and 2009.

				Change (1989–2009)	
		Year 1989	Year 2009	abs.	% (1989 = 100%)
Working days	Number of operated routes	42	38	−4	90.5
	Number of operated connections	2462	2359	−103	95.8
Weekends	Number of operated routes	30	29	−1	96.7
	Number of operated connections	1403	1572	169	112.0

Source: Brno public transport bus service timetable valid from 1 September 1989 to 30 June 1990; Brno public transport bus service timetable valid on 30 September 2009.

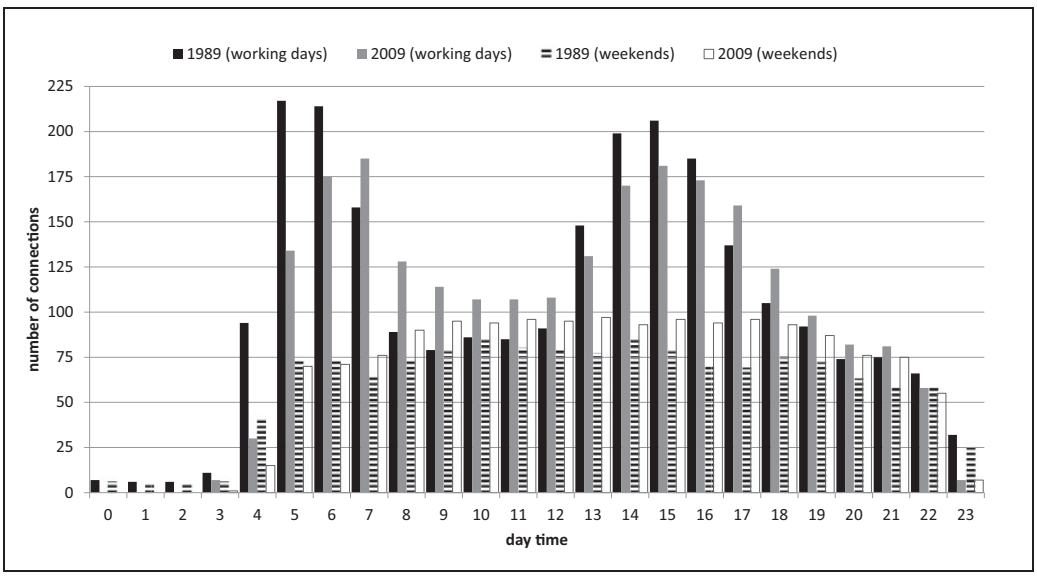

Figure 1. Changes of distribution of city bus connections in the course of the day in Brno between 1989 and 2009 (working days and weekends).

Source: Brno public transport bus service timetable valid from 1 September 1989 to 30 June 1990; Brno public transport bus service timetable valid on 30 September 2009.

the service sector whose working hours start later (the strong relationship between the industrial character of the city and the emergence of public transport peak hours between 5 a.m. – 6 a.m. was in Czech conditions confirmed e.g., by Řehák, 1979). A similar shift, although much less distinct, marks peak hours on working day afternoons. Also, the number of bus connections available in the evening hours of working days (i.e., between 6 p.m. and 10 p.m.) is apparently higher in 2009, which is probably also related to the active part of the day extending into later evening hours.

The distribution of bus connections over the course of the day on weekends has not changed since the end of the 1980s, as the rest days of the industrial city were without the clear pace of the working time start and end in large factories. However, although we can speak of a homogeneous temporal structure of bus connections during the rest days in both

Table 2. Typology of Brno public transport bus routes in 1989 and 2009.

Type	Characteristics of the individual types	Total number of:			
		Routes		Connections	
		1989	2009	1989	2009
Classic type	Moderate morning and afternoon peaks, differences in number of connections between peak and off-peak hours do not exceed 100%	11	8	780	546
Industrial type I	Well-pronounced morning and afternoon peaks, differences in number of connections between peak and off-peak hours exceed 100%	15	8	1251	634
Industrial type II	Extreme morning and afternoon peaks, no connections during off-peak hours	6	2	188	77
Homogeneous type	Without pronounced morning and afternoon peaks, differences in number of connections between peak and off-peak hours are negligible	8	12	231	615
Residual type	Routes with specific distribution of connections during the day	2	8	12	487
Total		42	38	2462	2359

Source: Brno public transport bus service timetable valid from 1 September 1989 to 30 June 1990; Brno public transport bus service timetable valid on 30 September 2009.

reviewed periods, small differences in their bus service offerings can be found—the most obvious is the clearly higher number of afternoon bus connections in 2009.

Based on the comparison of the city bus connections distribution over the course of the day in 1989 and 2009, a partial conclusion can be drawn about overall levelling of the previously distinct differences between the peak and off-peak periods.

Proportional changes in different types of city bus routes in Brno (weekdays, 1989 and 2009)

In addition to the analyses of the changes in the total number of bus routes and connections, and the changes in their distribution over individual parts of the day, an analysis of changes in the shares of different types of lines is required for the sake of the study of changes in spatiotemporal rhythms in Brno. In this paper, the term ''route type'' is understood as the way the bus connections on a given route are distributed during the course of the day. The following types of routes are distinguished: classic; industrial type I; industrial type II; homogenous; and residual. The basic characteristics of the individual types, supplemented with basic information on their shares in 1989 and 2009 are provided in Table 2 and Figure 2. The types of bus routes in Brno were defined for working days only, since intense spatiotemporal rhythmization was confirmed only on working days by the previous analysis (see Figure 1).

The difference in the distribution of bus connections in the course of the day between classic type and industrial type I is not very large according to Figure 3. Lines belonging to industrial type I offer just one more connection than classic type lines in average during peak

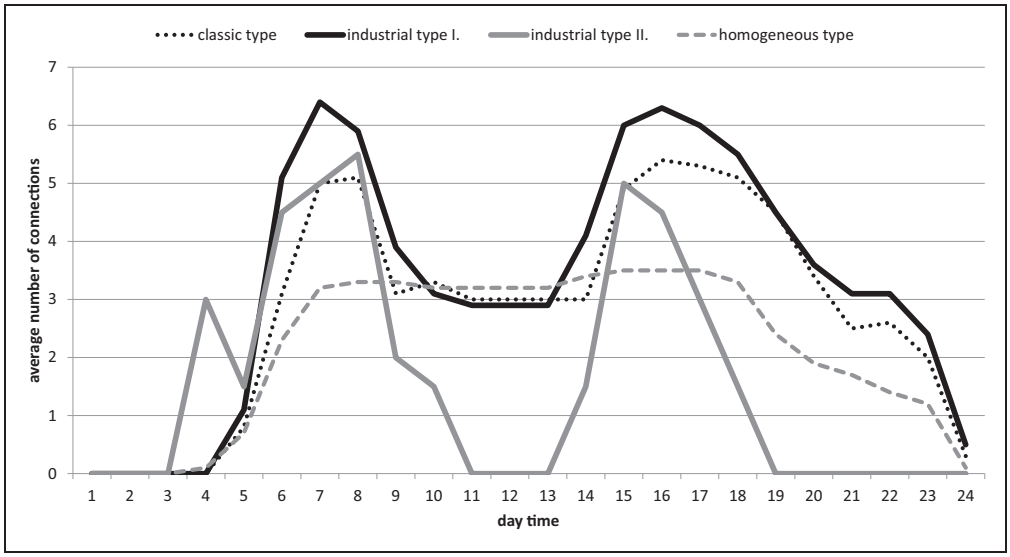

Figure 2. Distribution of city bus connections in the course of the day in Brno in 2009 (average number of connections per type of the route). *Note*: Figure does not include the residual type as the indicator of average number of connections cannot be applied on this type.

Source: Brno public transport bus service timetable valid from 1 September 1989 to 30 June 1990; Brno public transport bus service timetable valid on 30 September 2009.

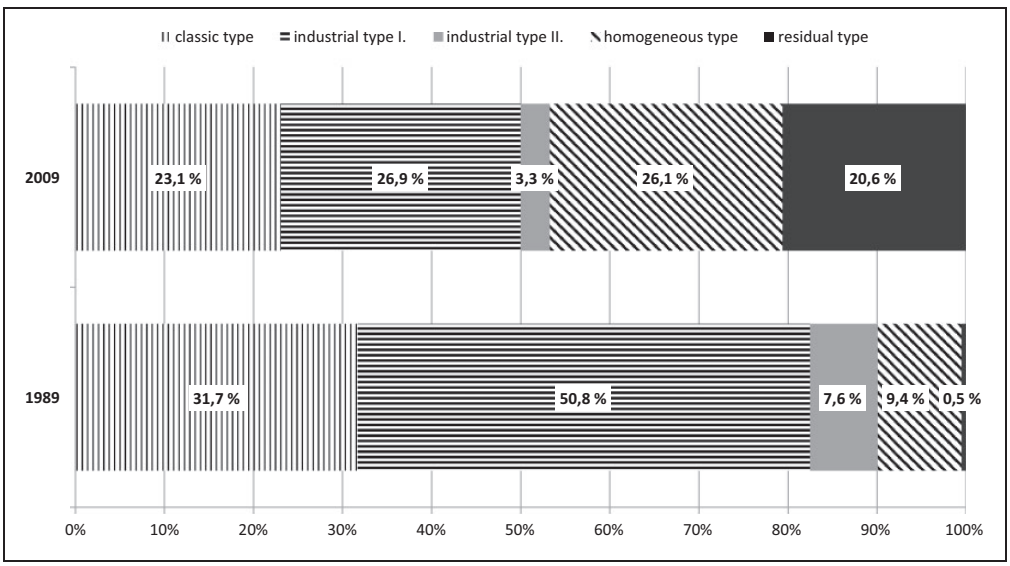

Figure 3. Share of route types on total number of connections in Brno (1989 and 2009).

Source: Brno public transport bus service timetable valid from 1 September 1989 to 30 June 1990; Brno public transport bus service timetable valid on 30 September 2009.

hours. However, we assume that the more than doubled number of connections during peak hours in comparison with off-peak hours signifies a big relative increase, which is the reason for recognizing them as two distinct types. Differentiating between these two types can be seen as arguable, but it still provides very evident and illustrative results.

The merit of a detailed analysis of changes in the shares of different types of bus routes between 1989 and 2009 lies—in our opinion—in the fact that this analysis allows a more nuanced view of the intensity of changes in the spatiotemporal rhythms in Brno.

The fundamental change, which occurred in Brno within the last 20 years, is represented by a relatively sharp decline in the shares of industrial types of bus routes, i.e. routes characterized by a strong expression of traffic peaks during periods corresponding to the beginning and the end of working hours in Brno's large factories. While there was a total of 1439 bus connections within the industrial route types I and II operating during working days in 1989, i.e. almost three-fifths of the total number of connections, the same types of routes included only 711 bus connections in 2009, i.e. less than a third of the total number. The extent of the shift in favor of route types without strong ties to the morning and afternoon peak hours is also underscored by the decline in proportional representation of classic routes, specifically from about one-third of bus connections in total in 1989 to less than one-fourth of the total in 2009. Although there is a general decrease in the number of connections between these two periods, it does not offer a relevant explanation of the decreasing share of classic and industrial I and II types of routes.

The decline in numbers of bus connections on routes with pronounced morning and afternoon rush hours in Brno has been counterbalanced by the significant increase both in absolute numbers and in shares of homogeneous (the type with a constant number of bus connections during the day) and residual routes (the type with bus connections showing a different temporal rhythm, which however is not typical for an industrially defined city—e.g., routes with a large number of bus connections in a specific part of the day). These types of routes comprised only 243 bus connections in 1989 (i.e., approximately one-tenth of the total), while they offered as many as 1102 bus connections in 2009 (i.e., almost one half of all bus connections operating in Brno during working days).

Yet another shift interesting from the geographical perspective occurred between 1989 and 2009. The shift concerns functions and locations of routes within the industrial type II, i.e. routes with the strongest ties to the beginning and end of working time in large industrial enterprises—bus connections on this type of routes were operated exclusively during the morning and afternoon peak hours.

This type of routes served two primary purposes in Brno in 1989. Firstly, it was direct rapid morning transport of workers from housing developments/key residential areas right to work and their swift transport back home in the afternoon. Secondly, the routes were connecting housing developments/key residential areas with important transfer hubs in Brno during the morning and afternoon peak hours, i.e. during periods when increased demand for transport could be expected in connection with a high number of people going to work and back home.

Between the late 1980s and 2009, there was a significant reduction in bus routes of industrial type II, as only two routes of this type with 77 bus connections were still in operation on working days in 2009. Their importance was minimized also from the geographical point of view, as they were redirected to suburban areas.

The above-described changes in the shares of the individual bus route types between 1989 and 2009 can be interpreted as a decline in the industrial significance of Brno, since the growing ratio of bus connections in classic and residual types of routes in 2009 seems to reflect a broader spectrum of spatiotemporal routines of the city's current inhabitants

structured by a wide range of pacesetters in the service and consumer sectors. It is also true that the service sector does not have such a powerful concentration effect on the functioning of the city (in the spatial and temporal sense) as industry does—for at least several reasons. In this respect, the greater dispersion of the service sector within the city area, the sector's lower dependence on extensive use of large quantities of manpower, and especially the more diverse working hours and times may play a role. All this leads to a more balanced demand for urban mobility over the course of the day, and in the light of the presented analysis, this fact is reflected by the increase of importance of homogeneous and residual types of bus routes.

Conclusion

This paper was inspired principally by the time-geography tradition, which provided the source for its assumptions, methods and, particularly, concepts. The paper tries to consider deeply and carefully the interdependent relations between time and space. Time is being inscribed into space, it shapes space, moreover, it is even being materialized in space in overlapping layers or strata of a kind (Simonsen, 2004: 50). Lefebvre discusses in this context that time forms sedimentary layers or, more precisely, palimpsest in space (Lefebvre, 1991: 229), Gregory similarly introduces the term history of present. Although these terms are different, their purpose is more or less similar—to identify processes from the past constituting the present (Gregory, 1994: 369). History is always embedded in space, it is always marking it in an inseparable way, thereby elements of industrialism can be observed in the postindustrial city. Stemming from the assumption discussed above, we studied here in detail the example of a particular space (the city of Brno) through its development in time. The main aim of the paper was, therefore, the comparison of different times within one specific space (Crang, 2011: 334–335) and not, at least in this case, the comparison of various time cultures of individual nations or distinct time regimes in different spaces (Larsen, 2004).

The presented empirical analyses illustrate the chosen segment of the postindustrial urban transformation. It should be acknowledged that the transformation process is not yet complete. The declining industrialism (from the broader, not just economic point of view) is being gradually overwritten by new spatiotemporal patterns, some of which have already been attributed to the postindustrial mode of the city functioning. As the presented analyses partially show, the current reality is in the state of transition—the chronotope ''industrial city,'' which acted as a universally valid concept of rhythmization of activities in the socialist Brno is no longer dominant. But it has not been replaced by a similarly universally valid and dominating configuration of spatiotemporal points/places yet.

While the industrial city may be viewed as a single spatiotemporal system from this point of view by virtue of the shared dominant rhythm, the loss of this rhythmic integrity in case of the postindustrial city necessarily leads to its disintegration into a number of places or clusters of places created and at the same time interconnected by specific rhythms. It is thus more feasible to conceptualize the postindustrial city as a set of spatiotemporal systems, where the specific rhythmicity does not dominate on the city level, but on the level of subsystems that connect specific groups of residents and users of the city with certain places. The resulting ''post-industrial city'' chronotope is thus more rhythmically diverse than the rather isorhythmic industrial city. From another point of view, the industrial Brno can be conceptualized as a chronotope dominated by collective rhythms, while in the case of the postindustrial phase of urban development, the chronotope is strongly individualized.

The individual components of the complex spatiotemporal system of a postindustrial city coexist side by side and mutually overlap. If we employ concepts of *palimpsest* (Lefebvre, 1991) or *history of present* (Gregory, 1994) as a starting point, we can consider developmental phases of society as layers permanently overwriting one another. The newly emerged postindustrial spatiotemporal configuration of the city is laid over the routines and rhythms of industrialism (without replacing them). Thus, we often witness functional or cultural conflicts arising from the existence of multiple time spaces in the contemporary city. The following appeal was published in Šalina, the monthly magazine of Brno Public Transport Company:

> Please, do something about the connections on tram route no. 12 in the direction from Zvonařka. We are not satisfied with the timetable which was probably designed by someone who does not use the route. **Normal people need to get to work at 6 a.m**., but then it is impossible to get around Brno without problems, in my case to get to Purkyně stop in Královo Pole. (Plus-minus, 2009a: 5)

The quoted request probably represents a person with spatiotemporal rhythms different from the daily routine of the author of the following text published in the same magazine:

> Could you please tell me why the bus connection on route no. 75 departing at 7.16 a.m. from Bílovice nad Svitavou and extended to Slatina railway station was cancelled during summer holidays? If I am not mistaken, the previous bus from Bílovice extended to Slatina departs at 6.16 a.m., i.e. an hour earlier! There are more and more office workers employed at Černovické terasy **whose working hours actually do not start at the traditional 6 or 7 a.m. but rather at 8 a.m. or even later**.'' (Plus-minus, 2009b: 6)

The coexistence of often very disparate spatiotemporal coordinates of routine urban activities could be in a very simplifying manner expressed as an overlapping of the relict time spaces of the industrial city and the new time spaces of the postindustrial city. As partly proven by the empirical study, the key reason for the changes in the spatiotemporal rhythms is the spatial, and particularly functional, dispersion of the pacemakers. An increasing share of the services sector in total employment, the strengthened role of the consumption function as a city-forming factor at the expense of the productive function, as well as fundamental changes in the understanding of and experiencing the urban way of living are contextual factors that affect the daily (as well as weekly or annual—however not concerned in the analysis) routinized spatiotemporal strategies of urban populations. Individual types of pacemakers are not equally significant for different groups of urban population. In comparison with the industrial city, the number of collectively shared pacemakers, whether of local (employment, consumption) or external character (e.g., TV) has dropped significantly. The increase in the number of individually defined pacemakers shattered the uniform rhythm of the city into a mosaic of rhythms visible through the routine city activities only at the scale of an individual or a narrowly defined group. This fact certainly brings up a number of secondary topics connected in this or that way with the spatiotemporal dimensions of urban life (land use and transport planning, access to public services and infrastructure, etc.). Their content, valid in the industrial city setting, is however dramatically altered in the conditions of the postindustrial city.

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Urban chronopolis: Ensemble of rhythmized dislocated places

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ABSTRACT

Urban rhythmicity, the topic of this paper, is to a certain extent a reflexion of the current discourse on approaches to urban research. The presented paper approaches everyday urbanism through rhythms. An urban place can be defined not only by its spatial attributes, but also through its affiliation to a particular spatio-temporal system. For this purpose the paper employs two theoretical traditions – Lefebvre's rhythmanalysis and Bakhtin's concept of chronotope. Lefebvre's rhythmanalysis should be seen here primarily as a framing outline, whereas Bakhtin's chronotope provides considerably more analytical power to delimit temporally-defined urban place as a typological category. These two traditions however offer only limited possibilities to follow temporal connections among the set of spatially dislocated places. For this reason, this paper develops Laguerre's concept of chronopolis, reconceptualised at the city-scale level. This paper aims to (i) further explore the nature of "urban polyrhythmia"; (ii) describe particular places as specific chronotopes; (iii) identify particular types of chronotopes based on the similarity of rhythmical profiles (chronopolis); and finally, (iv) to define the city as a set of particular chronopoles. The empirical part of the paper analyses a selection of localities within the space of Brno, Czech Republic. Based on long-term observations, a daily rhythm profile was described for each of 18 chosen urban localities. Particular types of chronopoles are identified according to their common rhythmical profiles stemming from the presence and absence of human users. The empirical part of the paper identified four different chronopoles (work-cycle, return, hot-spot, centre) that enable a description of the city as an ensemble of temporally rhythmized and spatially dislocated places.

1. Introduction

Urban rhythmicity, the topic of this paper, is to a certain extent a reflexion of the current discourse on approaches to urban research. For a long time, the subject of urban geography research seemed to be the city as a spatially fixed unit; the city as a Russian nested doll, dissembled into more detailed scale levels of districts and localities and assembled back into a uniform, relatively static and easy to interpret entity. Given the discipline's long survey and map making tradition, geographic approaches have always accentuated more static strategies of city imaging. Any urban variability and dynamics were largely seen as a result of the linear flow of time and documented through 'specific time-space samples' ignoring, however, the 'co-presence of multiple spaces, multiple times and multiple webs of relations, tying local sites, subjects and fragments' (Amin and Graham, 1997, p. 417–418).

New urban theory somewhat differs in its perception of the city. As Hubbard states, the 'tendency is therefore to emphasise the footloose nature of contemporary life, and to emphasise the stretching of relations of all kinds across both time and space' (Hubbard, 2006, p. 2). Relational approaches (Jacobs, 2012), various forms of deterritorialisation of the city, and concepts undermining the traditional idea of the discrete city (Crang, 2000) exceed the traditional topographical view of the urban space by applying more of a topological perception of the city and urbanism. However, the attention paid to a non-hierarchical, multi-scale and poorly-grounded relational processes leads in many cases to a situation termed an 'urban impasse' by Nigel Thrift (Lees, 2002, p. 102). The city itself is less emphasised as a subject and object of research, and urban issues are separated from urban materiality. The preference for global-local linkages often overshadows meanings, rhythms and locally given specificities of urban everyday life – in other words, the plurality and simultaneously the significant banality (Amin and Thrift, 2002) of everyday urban spatiality and temporality.

The presented paper approaches everyday urbanism through rhythms. A location's rhythmic profile is regarded as its inherent characteristic, which is not only shaped by present attributes but makes present/visible a whole range of placemaking factors that are locally hidden or absent at the same time, and thus puts the location within the broader space-time system of the city. The empirical part of the paper analyses a selection of localities within the space of Brno, Czech

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Republic, a city of approximately 500,000 inhabitants. Based on long-term observations, a typical daily rhythm profile was described for each of 18 chosen urban localities and then decomposed in an effort to identify its carrier and determine the current position of the locality within the context of the mentioned spatio-temporal organization of the city. The rhythm of a place is created by the actors present, while simultaneously defining these actors through the nexus of space and time. The morning train station belongs to commuters, mid-day city centre belongs to people going to lunch, with the advent of night, the same area is adopted and appropriated by visitors to bars and night-clubs. However, these examples are merely ideal samples of typical places during typical times. Apart from them, myriads of rhythmically hybrid places exist within the space of the city, localities with mutually diffusing temporalities and a complicated structure in the resulting rhythm. These are unitary locations in a spatial sense, but temporally layered and defined by a number of overlapping rhythmicities. They are places of fusion and spatio-temporal negotiation, places that can, in accordance with Lefebvre (Lefebvre et al., 2004), be called polyrhythmic. A similar logic can also be transferred onto the scale of an entire city. Urban space-time is an ensemble of rhythmised places, a more or, by contrast, less synchronized environment, a system of a single rhythm or, on the contrary, a polyrhythmia.

The paper has two research questions, a main research question and a specific research question which is application-oriented. The main research question reads as follows: *How does one describe the spatio-temporal structure on a city-scale?* The specific research question is: *Is it possible to employ the chronopolis concept in order to describe the spatio-temporal structure on a city-scale level? And in what way?* The specific research question holds the ambition of taking the concept out of the supra-national or global scale (Laguerre, 2003a, 2003b, 2007, 2010) and implementing it on the city-scale level.

The paper is divided into several sections. The introductory theoretical section discusses two concepts, which, to a varying extent and from slightly different viewpoints, theorise urban rhythms while outlining the tools for their empirical research. Attention was paid first to Lefebvre's rhythmanalysis and polyrhythmia respectively, emphasizing rhythmical unity of time and space, so meaningful to the conception of place on various scale levels (Pafka, 2013). Second, to Bakhtin's concept of chronotope, which represents, among other things, a spatio-temporal analytical unit in which place-based rhythms can be captured and analysed. A chapter addressing the ensemble of various chronotopes within city-scale space more specifically follows the theoretical introduction. Reaching the methodological and empirical issues, the term polis, or chronopolis, was taken out of its traditional context and redeveloped in order to grasp rhythmical analogies within a set of spatially dislocated urban places (urban chronotopes). Consequently, the methodology of the empirical work taking place in Brno, Czech Republic and the primary data used in the paper are presented. In the empirical part of the paper, the particular types of chronopoles are identified according to their common rhythmical profiles stemming from the presence and absence of human users.

2. Polyrhythmia – Different coexisting rhythms

Numerous works dealing with the topic of urban rhythms refer in their introductions to the work of Henri Lefebvre, specifically his text Rhythmanalysis (Lefebvre et al., 2004), which outlined the framework for perceiving temporality within a multiscalar concept – from the rhythms of the body to the rhythms of the locality or city. The emphasis placed on repetitive activities, movements and processes logically de-emphasizes the analytical significance of abstract linearly-flowing time for the benefit of localised cyclic time. According to Lefebvre, rhythm anchors time experience in physicality and in the material world. It is actually localisation and materialisation of time through rhythm that makes the concept of rhythmanalysis interesting for analytical use. Rhythm is not the object of analysis, it is itself an analytical tool that allows the research subject to be approached holistically as an 'open totality' (Lefebvre et al., 1996, p. 230). By open totality Lefebvre means metastable equilibrium which can be visualised, for example, as a city street animated during the course of a weekday by expected and regularly recurring activities and events. An event deviating from the established balance (e.g. a car accident, a demonstration) then significantly sways the usual rhythm, changing thus the identity of the place – the street ceases to be a street in the original sense of the word.

To underpin the complicated nature of the everyday life of the city, Lefebvre's proposed categories of polyrhythmia, eurhythmia and arrhythmia can be extremely well utilized, despite being primarily analogical, to describe corporeal rhythms. Polyrhythmia refers to a diversity of rhythms and represents a set of different rhythms coexisting within the observed totality. In the case of eurythmia, there is a mutual harmonious coordination of rhythms or a partial synchronization. Arrhythmia, by contrast, brings an almost pathological discrepancy of rhythms, perceived as a conflict or a problem (Laban, 2014). Therefore, if for the purposes of the study we assume that the space-time of the locality or of the city is a polyrhythmic set, the degree of (de)synchronization between various rhythms can be discussed.

Schwanen, Van Aalst, Brands, and Timan describe the complex relationship between the rhythms of specific locations as entrainment: 'Entrainment is the process of synchronisation whereby certain elements – Zeitgebern or pacemakers – impel others to take over or adjust to their rhythm' (Schwanen et al., 2012, p. 2069). Entrainment should be considered a struggle or negotiation between individual rhythms, taking place under the specific conditions of a given location and producing, at the same time, a rather idiographically capturable temporal identity of a locality. Polyrhythmia thus enables a place to be treated as a localised intersection of numerous diverse rhythms; however, not as an intersection at one point, but as a breakthrough of rhythms over a certain time period. Thus, the polyrhythmia of a place represents here a specific localised intersection of different rhythms during the day, a sort of resultant aggregated daytime rhythm of a place. When going beyond the scale of a place, it is possible to consider the whole city in a similar way, as a bundle of different city rhythms. In this context, Lefebvre's other work, *Writing on Cities*, in which Lefebvre compares the rhythmicity of the Mediterranean and Northern European cities (Lefebvre et al., 1996), takes on significance. In his analysis, however, the cities are not compared on the basis of a single city time, but on the basis of an ensemble of rhythms (Lefebvre et al., 1996, p. 230), also cited by some authors as an 'assemblage of different beats' (Crang, 2001, p. 189) or a 'polyrhythmic ensemble' (Degen, 2010, p. 25). These authors usually do not understand the city as one abstract temporality, but, like in the previous case, as an intersection of numerous different rhythms. While a place can be seen as an indivisible entity that is shaped by the encounters of rhythms in its entirety, the city shows different characteristics. The city is spatially divisible as it consists of individual places; specific urban rhythms are linked to typical urban locations, not to the city in its indivisible wholeness. Therefore, the polyrhythmia of a place and the city is not exactly the same. While the polyrhythmia of a place has a simple geography in that it is local, that all its rhythms concern only one location, the polyrhythmia of the city shows a more complicated dislocal geography in which all urban rhythms do not concern all parts of the city. Thus, rhythmanalysis is not just a tool for in-depth study of one single place (Wunderlich, 2010; Kärrholm et al., 2015; Osman et al., 2016), it can also be employed 'to explore the everyday temporal structures and processes that (re)produces connections between individuals and the social' (Edensor, 2010, p. 2) in a city-wide spatiotemporal context; in our case, the connections between individual human day paths and the city time-space.

3. Chronotope – Polyrhythmia of place

Lefebvre's rhythmanalysis is a very powerful concept provided we perceive rhythms strictly as an instrument of analysis and not as its

subject. Applying the view 'from the window' (Lefebvre et al., 2004), we can perceive the street, city square or any other single urban place in its space-time complexity. However, if we try to focus on the rhythm in order to understand the rhythmicity and temporal similarity of multiple urban places, other concepts need to be used. One of the so far only little-researched conceptual issues is the method of analytical approach and, in particular, the representation of the process of place-based entrainment described above. Selected authors (e.g. Folch-Serra, 1990; Holloway and Kneale, 2000; Ørstavik, 2005; Crang, 2001, 2005, 2011, 2012) refer to the concept of chronotope, which could serve as the framework allowing the capture of the polyrhythmic nature of an urban place and the characterisation of the place through this localised rhythm as a time-space entity (Mulíček et al., 2015). The author of the chronotope concept, philosopher and literary critic Mikhail Bakhtin, used it to analyse the appropriation of time and space in literary works. He perceived the chronotope as an analytical unit studying text (place) in terms of distribution and the character of the individual represented spatial and temporal categories with emphasis on their dialogical connection (Bakhtin et al., 1981). What is significant here is the interpretative function of the concept, the emphasis on negotiating the meanings of a specific place at a specific time, or specific time in a specific place (compare with the concept of kairos; Rämö, 1999). The chronotope does not describe the space-time of a place as an entity that can be grasped graphically, but as an entity that can be grasped (and understood) only through 'narrative visualization' (Folch-Serra, 1990, p. 258).

A very pragmatic application of the chronotope concept is present in the works of Italian authors concerned with urban time policies in particular (e.g. Bonfiglioli, 1997). Stabilini et al. (2013, p. 122) perceive and use chronotope as:

> 'inhabited place, where urban space meets the temporality of social interaction, which is regulated by public action for economical purposes (working hours), for social purposes (enabling the meeting among people and things) and for cultural purposes (local life traditions, marked in the historical and geographical features of the place)'.

Although this understanding of chronotope is rather influenced by the normative character of Italian time policies, it implicitly expresses the dialogue between the temporality of everyday social life and the materially perceived spatiality of the city. The application approach to chronotope also places major emphasis on absence/presence or co-presence of permanent or temporary users as the most important element creating a 'temporal architecture of a place'. Also discussed is the multiscalarity of the concept enabling the city to be perceived as a set of different chronotopes more or less tightly bound into the form a relational network (Mareggi, 2002). In this specific context, however, the expectations remain unfulfilled as the relationships between particular chronotopes are not specified in any way and the network of these chronotopes is not described in detail. Multiscalarity thus remains in the simple spatial description of the city as an unrelated set of isolated chronotopes. In this view, chronotope plays an important role in the spatio-temporal description of the polyrhythmia of individual urban places; however, it is less useful in the description of the polyrhythmia of the whole city (Bonfiglioli, 1997; Mareggi, 2002; Stabilini et al., 2013). Therefore, the chronotope concept in this article is used only to describe the polyrhythmia of individual urban places. By employing the chronotope, the locality can be grasped not only in a spatial/graphical way as a delimited piece of space, but also in a spatio-temporal way (graphically and narratively) as a timed, rhythmized place.

4. Chronopolis – Polyrhythmia of city

The concepts presented so far hold different relations to the needs of empirical research on complex city-scale polyrhythmia. Lefebvre's rhythmanalysis should be seen here primarily as a framing outline, a coherent but rather elusive way of thinking about the integrated spatio-temporal organization of the city. In this light, Bakhtin's chronotope provides considerably more analytical power to delimit temporally-defined urban place, first and foremost as a typological category. It offers, however, only limited possibilities of following temporal connections or analogies among a set of spatially dislocated places. In this respect, the concept of polis represents a more useful departure point not only for further theorisation, but for a more effective empirical description of particular chronotopic types that co-produce a complex spatio-temporal structure. The term polis originates in ancient Greece and has various meanings depending on the territorial and historical context. Polis is often translated as a city-state, however it cannot be considered a city from a contemporary perspective. The centre of Sparta consisted of only four villages – in spite of that, Sparta was a fully-fledged polis. The use of the term state is somewhat misleading too. The polis represented an agglomeration of people, a social group with a strong bond to a certain territory, not an abstract political entity emerging later on in medieval Europe. Even territorial attachment cannot be treated as a clearly defined attribute. In the case of the evacuation of Athens, there was always the option for the polis to exist in a new territory (Starr, 1986, p. 36–37). Although the existence of the polis was conditioned by certain territorial settings, the loss of territory did not always lead to the demise of the polis. Polis can thus be conceptualized as a territory with an internal order, where a specific set of single rules and laws is applied. It is a territory bound together by specific common activities, traditions and habits. The Athens polis, for example, was integrated through intensive maritime trade – the network of commercial ties interconnected communities spatially scattered across a number of remote islands (i.e. dislocated places); a shared organizing and integrating principle linked the non-contiguous area into the single polis (Parker, 2004, p. 40). Thinking more generally, the polis concept enables the integration of places into a more topological sense, where 'the gap between here and there is measured less by miles or kilometres and more by the social relationships, exchanges and interactions involved' (Allen, 2011, p. 284).

Chronopolis then represents a concept describing a polis in terms of its handling of time. Days, months, holidays and the very concept of time, with which the entire polis organized itself, was a public matter; its specific form was negotiated and its final shape had to be a result of at least a tacit consensus amongst a whole community (Clarke, 2008, p. 26). In other words, chronopolis is the expression of the coherence between the time culture of a community and the territory where this temporality applies. A number of authors speak in this context about diverging from geographically or spatially based conceptualizations of contemporary phenomena (globalisation, cosmopolitisation, transnationalisation, multicuturalisation, migration, acculturation, integration, segregation, etc.), favouring instead time-based conceptualisations of these phenomena (Cwerner, 2000; Adam, 2003, 2004). Time is thus no longer conceived as something external, but, on the contrary, as an integral part of a society's values (Coser and Coser, 1990, p. 191) which constitute, in part, the culture one has been socialized into (Adam, 1990, 1995; Nowotny, 1992). These assumptions are used by the social anthropologist, Michel Laguerre, who employs the concept of chronopolis to describe the temporal organization of transnational or transglobal communities. Laguerre perceives chronopoles as social or cultural entities (communities) which use similar temporal rhythms that differentiate them from each other (Laguerre, 2003b, p. 24), that differentiate them from the mainstream of society (Laguerre, 2007, p. 26), and that are spatially concentrated in enclaves across states (Laguerre, 2003b, p. 3). By time culture and shared rhythmicity of a community, Laguerre means maintaining inherent national calendars of ethnic holy days and holidays, developing a different weekly peak day, and a different business week cycle (Laguerre, 2003b, p. 26–27), separate from, and in competition with, mainstream practices (Laguerre, 2003b, p. 2). He considers religion the bearer of different time cultures, which he illustrates using the examples of Jewish and a Muslim chronopolis.

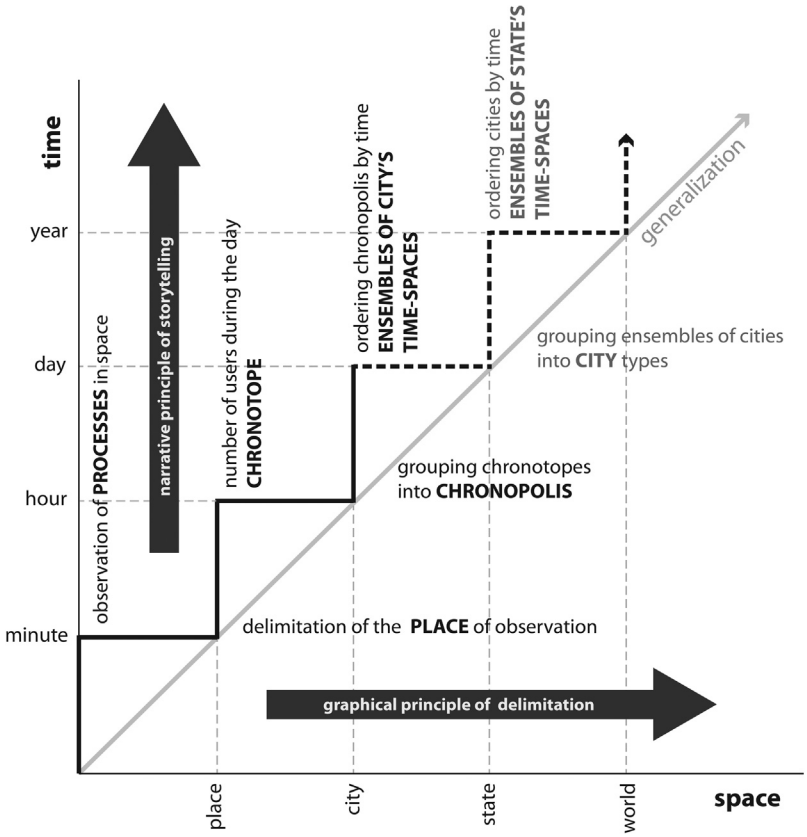

Fig. 1. Spatio-temporal analysis procedure – alternation of the narrative storytelling principle and the graphical delimitation principle.

> 'The chronopolis … is not simply a local entity, but is also and foremost a transglobal production. Globality implodes in the local structure and in the process temporizes its behavioral expression. […] Immigration simply implies a continuity of that practice, and in a sense transnationalizes and globalizes it. The Muslim living in New York is in temporal harmony with the homeland and with Muslims throughout the world as they are united by the temporal rhythms of their practice'.
>
> Laguerre, 2003a, p. 75–76

While the Muslim chronopolis represents a local materialisation of global networks, the aim of this paper is to sketch out the concept of chronopolis on the city-scale. As shown above, the chronopolis is to be partially reformulated in order to cover a number of urban places showing analogous rhythmic patterns, i.e. a number of identical chronotopes. Its presented meaning is built through a sequence of steps linking and developing particular spatial and temporal analytical categories into a single polyrhythmic reality (see Fig. 1). Identification and narrative description of temporally significant processes operating within the space enables an intuitive delimitation of places, i.e. localities that can be meaningfully defined in spatial (borders, structure) as well as temporal (fluctuations, rhythms) terms. Uncovering the typical place-making rhythms natively attached to a particular locality we proceed to chronotope, representing a basic building block of the structured time-space under investigation. In spite of the idiosyncratic nature of each chronotope, they can be categorized according to their rhythmical profiles, based, at least in the case of this paper, on the fluctuating presence of human users. The chronotopes attached to different (distant) localities but showing analogical rhythmical profiles represent chronopolis. Regardless of their position within the space, they are interlinked through common rhythmicity; referring back to the Athens polis example, a single chronopolis comprises the "islands" where time is spatialized in a similar way and where the course of the rhythm shows the same pattern. Chronopolis represents a specific approach to space and time that 'allows for events elsewhere to be folded into the here and now of daily life' of the city (Allen, 2011, p. 283). At the same time, it at least partially meets Crang's call for a new kind of topological imagination that grasps 'temporally simultaneous activities in spatially discontinuous locations' (Crang, 2000, p. 307). Like chronotope, chronopolis is primarily an analytical construct capable of covering spatio-temporality on the supra-local level. In this respect, we can approach the city as an ensemble of various chronopoles, and each chronopolis as an ensemble of various chronotopes. The deployment of this kind of analytical term is not purposeless – it brings a structuring principle to urban becoming (Amin and Thrift, 2002). There are differences between particular chronopoles, stemming from different distributions of rhythm peaks throughout the day. The transfer of people between places produces a temporal and procedural ordering in which specific chronopolis at specific times become the core units of encounters, transactions and intersections. By combining the polyrhythmias of individual places (chronotopes) into equally rhythmized but spatially dislocated polyrhythmias (chronopolis), there is a shift from topographically fixed chronotopes to more topologically defined chronopoles.

5. Methodology

This paper aims to (i) further explore the nature of "urban polyrhythmia", (ii) describe particular places as specific chronotopes, (iii) identify particular types of chronotopes based on the similarity of rhythmical profiles (chronopolis), and finally (iv) to define the city as a set of particular chronopoles. The main research question, the answer to which will be sought, reads as follows: 'How does one describe the spatio-temporal structure on the city-scale?' The main research question does not look for the city defined as an undifferentiated and uniform entity of one time and one space. Inspired by Lefebvre's polyrhythmia, it instead sees the city as rather heterogeneous ensemble of places and times that fuse into various time-spaces. On the other hand,

the main research question still calls for some kind of synthetising description of these coordinated couplings of various places and times. There is no need to structure the city solely in spatial terms, taking it place by place (from the centre outward, from east to west) or solely in temporal terms, period by period (from Monday to Sunday, dawn to dusk). The aim is to depict the spatio-temporal pattern decomposing the city into a set of temporalised places and localised times – chronotopes. In other words, the research question can be more specified in the following way: *How does one describe the city as an ensemble of mutually interconnected chronotopes?* The secondary, more application-oriented question is: *Is it possible to employ the chronopolis concept in order to describe the spatio-temporal structure on a city-scale level? And in what way?* The concept of chronopolis was not newly constituted in the paper – it was just reformulated to fit the city-scale. The secondary research question thus carries the ambition of taking the concept out of the supra-national or global scale (Laguerre, 2003a, 2003b, 2004a, 2007, 2010) and implementing it at the city-scale level, as well as confirming its capability to uncover the spatio-temporal city structure.

In order to fulfil the research questions, it is necessary to delimit the area under investigation in (i) spatial, (ii) temporal, and (iii) empirical terms. Spatially, this article is primarily based on data acquired in the second largest city of the Czech Republic – Brno.[1] Brno itself, however, is not the subject of interest. It is a research field for the study of the real research subject: the description of linkages between chronotopes. The description of the city of Brno is thus not important, as the principal focus of the research is the depiction of spatio-temporality on the scale of the city. This type of research could in fact be done in any city; the selection of Brno was based on criteria such as the geographic and economic accessibility of the observation. The observation itself was focused solely on Brno's public spaces. Virtual or cyber spaces (Batty, 1997; Kitchin, 1998a, 1998b; Dodge and Kitchin, 2001; Crang et al., 2007; Graham, 2013) were excluded from the observation scheme for two reasons. Firstly, there is a long tradition of studies exploring the city public space (Lynch, 1960; Jacobs, 1961; de Certeau, 1984; Sennett, 1986; Gehl, 1987; Sorkin, 1992) and the role of time in public space (Lefebvre et al., 1996, 2004; Thomas and Bromley, 2000; Nelson et al., 2001; Bromley et al., 2003; Kärrholm, 2009; Kärrholm et al., 2015). The second reason concerns the reconceptualization of chronopolis, which is necessary for its application on the city-scale level. Virtual space represents a key condition to forming the chronopolis operating on the supra-national or global scale (Laguerre, 2003b, 2004b, 2007, 2010); however, it is just one of many possible spaces in the case of chronopolis emerging on the scale of the (European) city. In other words, the activities taking place in the public space are still important in the context of the compact city and its relatively short walking distances and dense network of public transport (Ďurček and Horňák, 2016). There were 18 selected localities within the public space of the City of Brno. Locations were selected randomly, based on general criteria. The locations had to be public without direct signs of surveillance. They had to be unroofed areas and it had to be possible to visually check the whole location from one place. The selection of particular localities was not crucial, not even in terms of size, structure, function, or their locations within the city. The selection of the localities was not intended as an exhaustive representation of the complex time-space of the city, but rather a reflection of the effort to cover the variability of the urban time-spaces. Despite this effort, there are certainly missing types of localities, such as large shopping malls, residential suburbs and gardening plots. The selection is not a representative sample of all types of localities within the city, and is instead a random set of localities collected in order to explore the temporal relations between them. The purpose of the sample is then closely related to the sample size. The amount of localities observed, 18, was not arbitrarily determined in advance, but itself represents a partial result of the analysis. The concept of theoretical saturation was used to determine it (Strauss and Corbin, 1999 p. 140; Charmaz, 2006, p. 113-115; Clarke, 2005, p. 108; Clarke et al., 2015, p. 226). The number of observed localities had been gradually increased until we were able to identify particular types of chronotopes based on the similarity of rhythmical profiles (chronopolis). When reaching the number of 18 localities, four types of rhythm profiles clearly appeared and observations were stopped. However, it is very likely that if other locations continued to be observed, it would be possible to identify more types of chronotopes (chronopolis). Since it was not the intention of the study to represent all the chronopoles in the City of Brno, but to represent the possibility of interconnection between particular places based on their rhythmic similarity, 18 localities were shown to be sufficient for this purpose. Of the 18 surveyed localities, nine were squares, four were crossroads with a transfer between different public transport lines, three streets, one railway station and one corridor exit. The scope and boundaries of the localities were not adjusted arbitrary in advance – their delimitation was carried out during the observation itself. The place-making role of spatial or morphological attributes (street line, wall, fence, road, rails, river, crossroad, etc.) was diminished in favour of temporal ones (movement, flow, process, etc.). The aim was to identify as closed a system of flows, rhythms and processes as possible within an area and observe it in actuality. In other words, the boundaries of the locality stem from the observation. They do not represent the delimitation of place in the spatial sense, but they enclose the defined time-space, delimited in a spatio-temporal way. The spatio-temporal way of delimitation does not aim to create particular time-spaces as mutually separated entities (Subrahmanyam, 1997); the aim is to grasp them methodically in connection with other (spatially) separated (Osman et al., 2016) but (temporally) synchronized time-spaces (see Fig. 2).

As for the temporal aspects of delimitation, we confined them to the public time on the scale of the working day within the civil week. We abstracted from virtual time (Laguerre, 2004b, 2005; Crang et al., 2007) and religious time (Laguerre, 2003a, 2003b, 2007, 2010) as well as from the time scaled by months, seasons or years (Jauhiainen and Mönkkönen, 2005; Palang et al., 2007; Symonds et al., 2015; Kraft and Havlíková, 2016). There is again a rather methodological reason for such a limitation. In order to achieve the aim of the paper and answer the research questions, there is neither the need to study one or two localities for a long-time period, nor the need to depict changes in the locality over the course of a month, season or year. On the contrary, the research questions assume a relatively detailed temporal description of a large number of diverse localities. From this standpoint, the temporal scale of the working day provides an ideal compromise between a sufficient number of observed localities on one side and manageable detail of their observation on the other. All localities were observed for extended periods of at least 24 h in each case. This observation, however, was not conducted all at once, but over the course of two months, and more specifically in April and May 2015. The spring season was chosen due to a certain normality or ordinariness in the outer conditions. It is the season without winter frost and summer heat, there are neither Christmas nor summer holidays, it is the midpoint of the school and university semester, a season without any major singularities. In this respect, the selection of the months of observation followed an effort to choose the most secular parts of the year, to eliminate the influence of the Christian calendar and to focus on a description of the working day rhythm. The observations thus were not conducted over a single day, but on different days and at different times. Fridays, Saturdays and Sundays were excluded from the observations so as to concentrate on the rhythm of the working day. This decision was

[1] The city of Brno has a population of about 350,000 inhabitants, while being used by over 500,000 citizens for their daily activities on weekdays and during university terms. Brno has a long industrial history and, as in most cities in post-socialist space, signs of both post-industrialism and post-socialism mingle here. Even today, scars of World War II remain visible, both material (the bombings) and social (especially after the expulsion of Jews and subsequently Germans). Some temporal traditions of the Austro-Hungarian Empire are still institutionally maintained as well.

Fig. 2. Spatial distribution of the surveyed localities in Brno. 1 and 2 Chronotopes = Work Cycle Chronopolis; 3 and 4 Chronotopes = Return Chronopolis; 5–8 Chronotopes = Hot-Spot Chronopolis; 9–12 Chronotopes = Centre Chronopolis.

derived from the aim of the project - to capture the urban everyday life organized by the workweek in Brno. The observation was carried out only for the active part of the working day, specifically from 6.00 am to 10.00 pm. There are two contexts justifying this temporal limitation. Firstly, there is a difference in public transport operation between daytime and night-time. While the intensity of public transport services is high (a dense network and a high frequency of links in operation) during the daytime (6.00–22.00), only a few selected routes are operated at one-hour intervals during the night-time. Secondly, the opening hours of shops are strongly concentrated within this period (Mulíček and Osman, 2013). The empirical analysis was thus embedded into the spatio-temporal frame of 18 localities in Brno observed during the active part of the working day of the civil week in spring 2015. Semi-structured observation was selected as the basic method of data collection. By semi-structured observation we mean observation with a flexible or loosely defined structure enabling the researchers to react freely to any observed process or event in the locality (Spradley, 1980; Lofland and Lofland, 1995; May, 2002).

Empirically, only human users of the locality were observed and counted. Goods, animals, vehicles, other non-humans and even people in the vehicles were excluded from the count. The reason was the different behaviour and thus different rhythmicity of these actors. Rhythmicity of non-humans is, of course, a perfectly legitimate direction for the study of city time-spaces, and the presented re-conceptualisation of chronopolis to the scale of the city does not limit this in any way. The deliberate limiting of the project solely to human rhythmicity only reverts back to the original concept of global-scale chronopolis, in which the humans are considered the principal carriers of specific time cultures (Laguerre, 2003a, 2003b, 2007, 2010). The only exception to this rule were taxi drivers, whose presence, even though they often sat inside a car, greatly influenced the situation of non-motorized users of the locality. Skaters, cyclists, motorcyclists were counted only when they had appeared off the motor vehicle roads.

A preliminary set of key themes was prepared prior to the observation itself. The themes were as follows: What is the physical appearance of locality users? How fast do people move in the locality? How straightforwardly do people move within the locality? Does any direction of movement dominate? Do they move individually, in pairs or in groups? Are they staying, or just passing through the locality? For how long do they stay? What activities do they pursue here? Field notes from this part of the observation were taken. On average, there were 10 A4 pages from each locality. At the same time, the number of present users of the locality was counted. Every person present at a given moment was considered a present user. The present users were counted every 15 min between these hours. Determining the count frequency again represented a difficult methodological decision. In the end, a purely pragmatic reason prevailed – the feasibility of counting with only a single observer. Since the set of observed localities comprised those where the present users could not be counted in a period shorter than 10 min, the 15-min interval became the shortest interval in which it was still possible for a sole observer to count. The numbers of locality users present during the day are shown in the graph which displays two values: the 15-min absolute number of users and the hourly average number of users. While the data structured in 15-min intervals shows the hourly rhythm of the location, the data structured in 60-min intervals shows the daily rhythm of the locations. A single graph thus allows for the observation of two different scale level rhythmicities of the same locality.

The analytical sequence comprises five steps in which a narrative analysis of time alternates with a graphic analysis of space (Fig. 1). In the first step, the localities were observed prior to their delimitation. Attention was paid to movements, flows and processes visible in the space; the observers captured a story of the locality which was narrated through the presence of users. Consequently, as the second step, the particular localities were spatially delimited following the semi-closeness of the observed processes. In the third step, the number of users present in the locality were summed every 15 min. The frequency curves visualizing the numbers of users during the daytime represent certain daily rhythms; it tells us a partial story of each of the 18ob-served localities. Comparative analysis was employed at the fourth step to confront the rhythm profile of the localities, i.e. to compare the observed rhythms of the present users. The similarities among particular frequency curves was taken as a point of departure for the identification of specific types of analogically rhythmized places, i.e. distinct sets of chronotopes representing distinct chronopoles. Only data on the number of users present in the locality was used to identify analogically rhythmized sites in this step. Other data inputs captured by semi-structured observations did not affect the identification. The rhythmic profile of the localities or, more precisely, the shape of the curve of the changing number of users present during the day became the only criterion attributing individual chronotopes to chronopolis types. Fifth, the stories of all identified chronopoles were narrated. At this stage, other data from semi-structured observations was employed as well. In the descriptions of individual locations attributed to the

same types of chronopoles, similarities were sought that could explain their analogous rhythmicity. These were subsequently used for a narrative description of the daily story of each chronopolis type. Particular chronopoles were then ordered chronologically by the times their localities recorded a peak number of users. This chronological set of stories was finally employed to present the storyline of the city as a whole.

6. Selected chronopoles on the city-scale level

6.1. Work cycle chronopolis

The first defined type is the work cycle chronopolis. It comprises two localities (chronotopes). One is a square, the other is a street. However, this designation is rather confusing in both cases. The square does not function as a place of meeting and has no accumulation of services, shops and restaurants; the square is more of a crossing of several streets. One of the city's traffic arteries combining individual car and tram transport passes through the square and there is a tram stop directly on the locality. The other locality is described as a "street", however a "transfer node" would be much more fitting. What is it then these two localities have in common? They are not very busy for most of the day. They are among the localities located farther from the city centre. No important institutions are located directly on them, nor in their immediate vicinity. There is not even a significant aggregation of services. However, main roads pass through them and both are serviced by core lines of public transport. Work cycle localities thus do not serve as target locations for their users, do not concentrate activities, do not produce their own rhythms. On the contrary, they are almost exclusively areas of transport, their users walk or drive through them, or just use them as transfer points. These localities thus become a spatial stage set, where a combination of rhythms of other localities or eventually trans-local rhythms can be observed. This example clearly shows that the location cannot be considered non-rhythmized or, more precisely, a locality with no specific rhythm. If there is no pacemaker present at a given locality, if the locality itself does not set any rhythm, then it receives external, wider, trans-local, city-wide rhythms and repeats – (re)produces – them. The work cycle chronopolis thus can be considered an echo of a kind. Locations of this type are not the targets of activities, they reverberate the rhythms of other, distant targets of residence, work and school. Locations frequently manifest this echo in the form of arrival/disembarking, waiting, and departure/boarding, and do so especially during the peak hours of 7:00 a.m. and 9:00 a.m. and between 2.00 p.m. and 5.00 p.m. The work cycle chronopolis thus can be characterized by a rapid fluctuation in the number of present users, caused by the presence of public transport stops, and a significant difference between the number of users inside and outside of rush hours (see Fig. 3).

6.2. Return chronopolis

The return chronopolis is described here using two example locations. One is a square, the other is a street intersection functioning as a transfer point. The square is located right in the middle of one of the largest housing estates in Brno, occluded by a "shopping centre" providing various services, the main attraction being a grocery supermarket. At the same time, it is a location quite far from the city centre (approximately 25 min by public transport). The other locality represents a very diverse area dominated by passenger car traffic. Simultaneously, the locality serves a number of other functions – yet again, there is a grocery supermarket, a multifunctional municipal hall (ice hockey, concerts, etc.), a busy transport hub, and the residential function of the locality is also present. This locality is, however, in close vicinity to the historic centre (approximately 5 min by public transport). What they have in common is that a number of essential functions are present or in close proximity, and they are directly embedded in housing areas of the city. As in the previous case, the localities are dominated by traffic, and specifically by public transport. This is apparent in the morning but particularly during the afternoon rush hour. hile the afternoon rush hour overshadows the rest of the day, the morning peak is barely recognisable. While in the morning rush hour people move individually, quickly, and following direct routes, they are much slower in the afternoons, stopping, waiting, meeting others, talking, and there are a larger number of couples and larger groups. The localities are used purely for the purpose of transportation during morning rush hours; however, people use the locality for shopping, withdrawing money, discussing, etc. during afternoon rush hours. On one hand, the morning rush hour is harder to capture, while on the other hand, it is demonstrably smaller. We could speculate that people take more time to commute to work (a longer time period), that they use different localities on their morning routes (for the shortest time), or that they use other means of transport (they go by car in the morning). Nevertheless, whatever the reason, it is clear that people spend far less time on the localities during the morning peaks than in the afternoon peaks. In contrast to the previous chronopolis type, these localities are equipped with grocery supermarkets, which have become a frequent destination for locality users, especially in the afternoon hours. In terms of time, it is convenient for most of the population living in Brno housing estates to go shopping on their way back from work. For this strategy to pay off, the locality must be equipped with a large number of lines with a high departure frequency, which is true of both localities as can also be observed in the extreme fluctuation of the 15-min interval user counts (see Fig. 4). The return chronopolis can thus be characterized by a significant preponderance of afternoon activities over morning activities and by a fluctuation in the number of present users due to the presence of public transport stops.

6.3. Hot-spot chronopolis

The hot-spot chronopolis comprises two squares adjacent the historic centre of the city; one centre of a neighbourhood on the outskirts of the city, equipped with a tram terminus; and one bus station serviced by international carriers. Their common feature is a comparable number of users present in them throughout the daytime. Their presence has a slightly different cause in each location, but in all cases there is an alternation of users. The hot-spot locations are not populated with the same users throughout the day, but they gradually mingle, transfuse and even alternate. On one of the squares, this flow is ensured by a higher number of major institutions with varying rhythmicities. There is a court, a cinema, an art gallery, a market and a number of small shops and cafés. The locality is located on the edge of the historic centre offering excellent accessibility and it can be both the destination of a journey or a journey in and of itself. In other words, a variety of people keep turning up during the day pursuing different objectives and using various services. The second square has a similar disposition. It is also located on the very edge of the historic centre, featuring a theatre, a municipality hall, an art house, several banks as well as a number of smaller shops. In this case, however, the transport function is dominant as well. Several tram lines cross here, but they do not eclipse the locality. They awaken the location more quickly in the morning, but without emphasizing the work day cycle. An essential peculiarity of the square is its location on the border of the largest excluded area in the city, which shows all the signs of segregation –residential properties in poor condition, a high unemployment rate, and the presence of ethnic minorities, etc. Noticeably different social groups of users mix within the square, the rhythmicity of unemployment interestingly combines with the rhythmicity of work cycle, and the square maintains a high and relatively balanced number of users this way. What both squares have in common is the presence of an institution offering a range of evening activities (cinema, theatre). The presence of this type of institution thus prevents their depopulation in the late afternoon.

A third location exhibiting the characteristics of the hot-spot

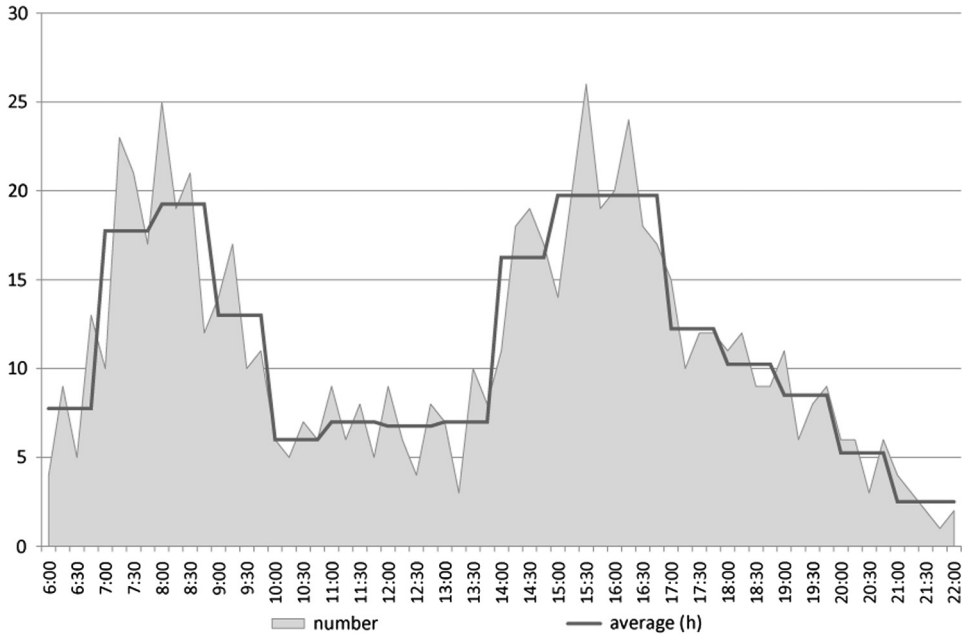

Fig. 3. Work cycle chronopolis – the example of Burianovo Square, Brno, Czech Republic.

chronopolis is the centre of a neighbourhood on the outskirts of the city equipped with a tram terminus. It mainly serves a transport function. People come here so they can go to the centre of the city and later return here to get home. The alternation of social or age groups of users again causes a continued presence of users throughout the day. This is because the tram terminus serves as a departure and arrival locality for the adjacent complex of college dormitories. Once again, the work day cycle (workers) mixes with a nonworking cycle (elderly, students).

The fourth and last location of the hot-spot chronopolis is represented by the bus station. Transport companies using the observed station are generally considered more expensive, more luxurious and for more upmarket-clientele focusing carriers. A considerable proportion of their clientele are thus foreign tourists. The observations show that their behaviour is markedly different from the behaviour of local users, and that they can be easily distinguished from observation. While local users leave immediately after their arrival, tourists remain in the area. They often switch their phones on, make phone calls, change their clothes, open luggage, look around, look for information signs, maps, inquire about directions, etc. They even questioned the observer every so often. At the same time, it is clear that tourists often come to the bus station relatively well in advance, while the locals rather tend to arrive at the last moment and are quite often seen running to catch their bus. There is, however, another, third, group of users who systematically focus on the wealthier tourists unfamiliar with the local context. These users remain at the locality even between the arrival and departure of buses. They most often stand around snack bars, drink, smoke, discuss, and address passers-by, etc. At least three different rhythms can be discerned in the area, which differ among the groups. The differences in behaviour of each of these three groups is then enough to reconcile the simple rhythmicity of the bus timetables and generate an even number of present locality users throughout the day. The hot-spot chronopolis can be characterized by a relatively even number of visitors present at the locality throughout the entire day time (see Fig. 5).

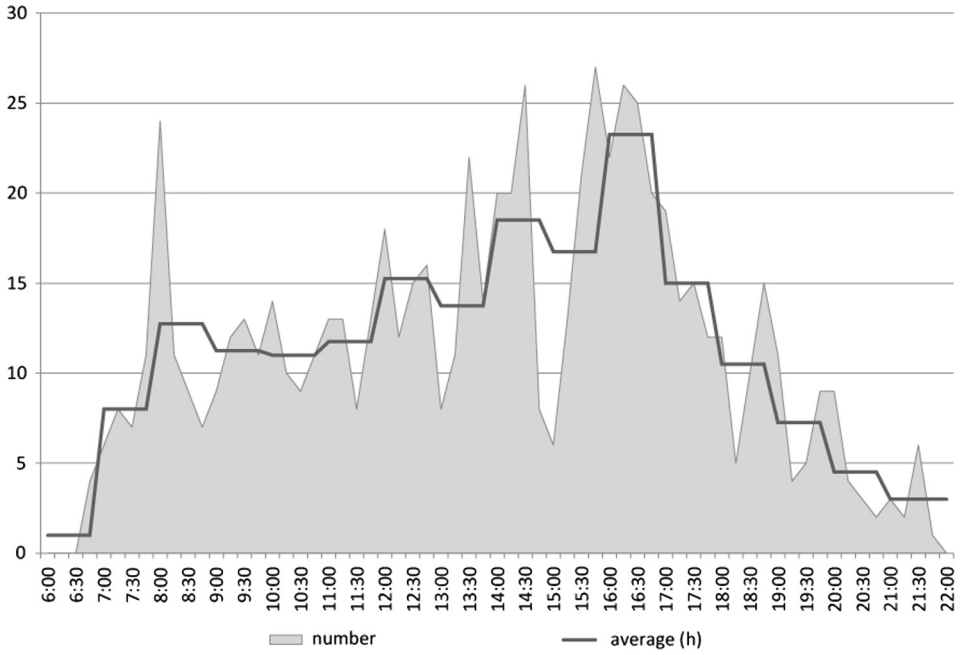

Fig. 4. Return chronopolis – the example of Pálavské Square, Brno, Czech Republic.

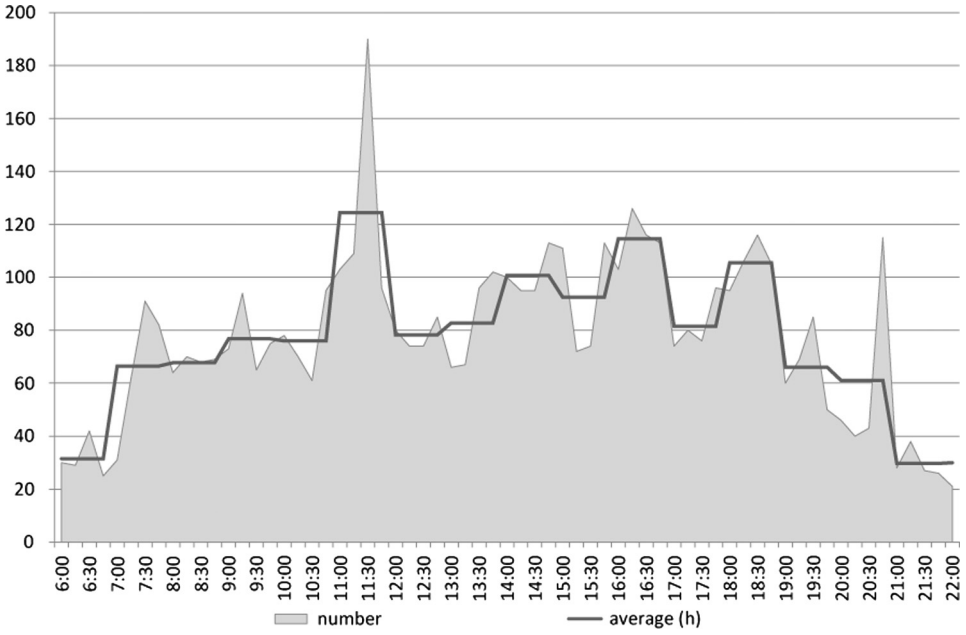

Fig. 5. Hot-spot chronopolis – on the example of Malinovského Square, Brno, Czech Republic.

6.4. Centre chronopolis

The centre chronopolis stems from observations in two squares, one street with a National Library and one corridor exit. The two main central squares of the city were chosen: one located in the very heart of the historic centre, where the most important public activities are taking place; the second is adjacent to the historic centre and is a vast expanse with grass in its centre serving as a park where people usually sit and/or lay down. Because of the overall size of the square, only a selected part with a local grocery market was observed. Both observed localities in the squares are crossed by tram lines, but neither of them is equipped with a tram stop. The third area is then formed by the street in front of the Moravian Land Library. The library is located outside the city centre (approximately 10 min by public transport) and is the second largest library in the Czech Republic, lending over 500,000 items per year. There is a sculpture of benches primarily used for meeting, reading, smoking, and consuming food and drinks; a stairway used by skateboarders for training; bicycle racks; and a telephone booth in front of the observed entrance. The fourth locality is the corridor exit. It is a certain section of an overhead street leading through two shopping centres and connecting the main railway and bus stations. It can be attributed several specific features. First, it is one of the busiest thoroughfares throughout the city; second, it goes through buildings, passes under the main railway station and again appears on the surface; and third, it concentrates its users into a very narrow corridor, where a separation into two lanes according to the direction of movement has been customarily maintained.

All these four localities (chronotopes), however, exhibit similar rhythmicity. All these localities comprise the target(s) of user flows or, as in the case of the fourth location, are in close proximity of a target. At the same time, they reach their maximum numbers of present users in the middle of the day, around noon. This mid-point is not identically timed for all the localities – some reach it earlier, perhaps as early as 11:00 a.m., while others at a later time, perhaps as late as 2:00 p.m. – but it is always close to the middle of the daylight hours. The number of users present in these locations does not grow higher or lower in large steps, but gradually (see Fig. 6). The targets, however, differ. In one square, it is mainly the local food market; in the other, it is a tourist attraction and a variety of daily events (concerts, shows, contests, tastings, exhibitions, etc.); in the third location, it is a library; and in the fourth, it is a combination of transport terminals and shopping centres. Public transport stops are either so far away that their rhythm is too weak to have influence, or the number of users present is so large that the role of public transport as a pacemaker becomes an indistinguishable oscillation. The number of users present is not as fluctuating as in other cases, and their daily distribution is approaching a normal distribution. The locations wake up gradually and gradually fall asleep; they are neither exposed to the morning traffic rush-hour, nor do they involve the institutions of evening activities. An interesting fact is that in the centre chronopolis, the number of users present follows the curve of the daytime temperature. It could therefore be the case that towards the summer months with its warmer nights, the distribution of users present could extend more significantly toward the evening part of the day. The chronopolis of the centre can thus be characterized by a more or less symmetrical distribution of users present throughout the daylight hours, by the maximum number around the middle of the daylight hours, and the absence of fluctuation in the 15-min interval counts of users present.

7. Conclusions

The presented text portrays the space-time of the city as a polyrhythmia within the meaning of Lefebvre's rhythmanalysis. Rhythmanalysis serves here as an initial philosophical framework allowing it to proceed to more detailed empirical analyses of individual urban locality rhythms through the concepts of polyrhythmia, chronotope and especially through the concept of chronopolis. The urban place is conceptualized as a space-time unit – we use the term chronotope. Chronopolis represents a supra-local time-space category incorporating analogically rhythmized chronotopes. Urban time-space is then understood as an ensemble of various types of chronopoles, which integrate the places of similar rhythmicity.

Individual locations are not rhythmized equally. Each location exhibits its own specific rhythmic character. It cannot simply be assumed that the rhythm is determined by the plain function of the locality, that e.g. all transfer points will exhibit a similar rhythm and therefore form a homogeneous transfer node chronopolis. On the contrary, based on the observations, it showed that the inductive approach to the locations, represented by relatively time-consuming observations, first allows for the uniqueness of each of the locations (chronotopes) to be captured, and subsequently for similarities to be found. The analysis proved that very different localities, varying in their functions, sizes or location within the city, can correspond to the same chronopolis. Contexts and causes may be different, but the rhythmicity of the locations is similar.

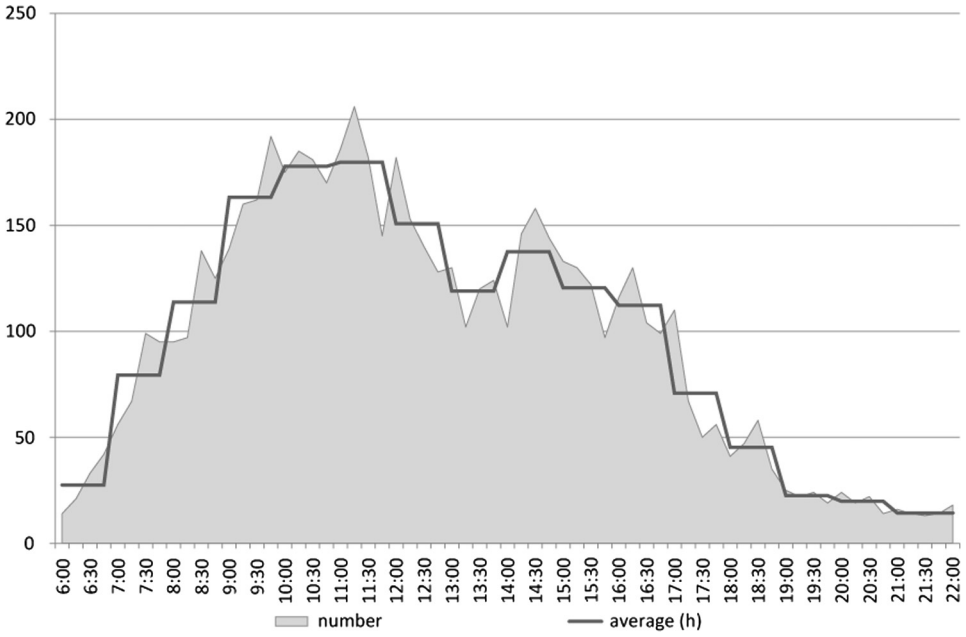

Fig. 6. Centre chronopolis – the example of a part of Moravské Square, Brno, Czech Republic.

The paper thus shows that designations such as street, junction, railway station, and square represent some sort of customary categories, which however express only the architectural (spatial) structure of the place at best. They definitely do not serve as categories that would express the character of the locality, its behaviour or its (temporal) story. Describing locations using the more general categories of chronotopes allows for the capture of their procedural, or rhythmic character.

The chronotopic approach thus allows us to consider individual locations as unique intersections of time and space. Some locations are therefore able to generate their own rhythms and create their own local times. Other locations become only a spatial stage set, a theatre where the rhythms of other localities or eventually trans-local rhythms manifest. And clearly, there are localities where local rhythms are combined in various ways with trans-local rhythms. Using this perspective then dramatically changes the approach to the rhythmicity of the city as a whole. The rhythm of the city in terms of localised chronotopes cannot comply with the idea of a single synchronized machine. Instead, it offers a model akin to a 'flashing Christmas tree' where various rhythms manifest only in specific locations while other rhythms manifest in different locations. This is due to the fact that some (spatially separated) locations switch on throughout the day (one chronopolis), while other (also spatially separated) locations switch off (a second chronopolis). The city thus beats at different times in different places. The description of the daily rhythm of the whole city is then bound to become too complicated. It is possible to resort to describing the entire territory of the city at a single moment or to describing the entire day in a single location. The method presented in this paper thus offers some kind of compromise – to describe the rhythm of the city as narratives of individual chronopoles (see Fig. 7). In other words, to start with a narrative about localities which are dominated by the earliest rhythm (in our case e.g. the work cycle chronopolis), continuing the tale of locations with distinct morning rhythmisation (the hot-spot chronopolis), follow with the stories of locations with significant midday activity (centre chronopolis), go back to the locations rhythmized by afternoon activities (work cycle chronopolis), supplement them with locations with maximum activity in the late afternoon (return chronopolis), and finish the narrative with a description of locations with a presence of evening rhythms (hot spot chronopolis).

The four identified chronopoles, however, do not constitute an exhaustive list of all possible chronopoles. Those are only the selected chronopoles we were able to identify based on the empirical material

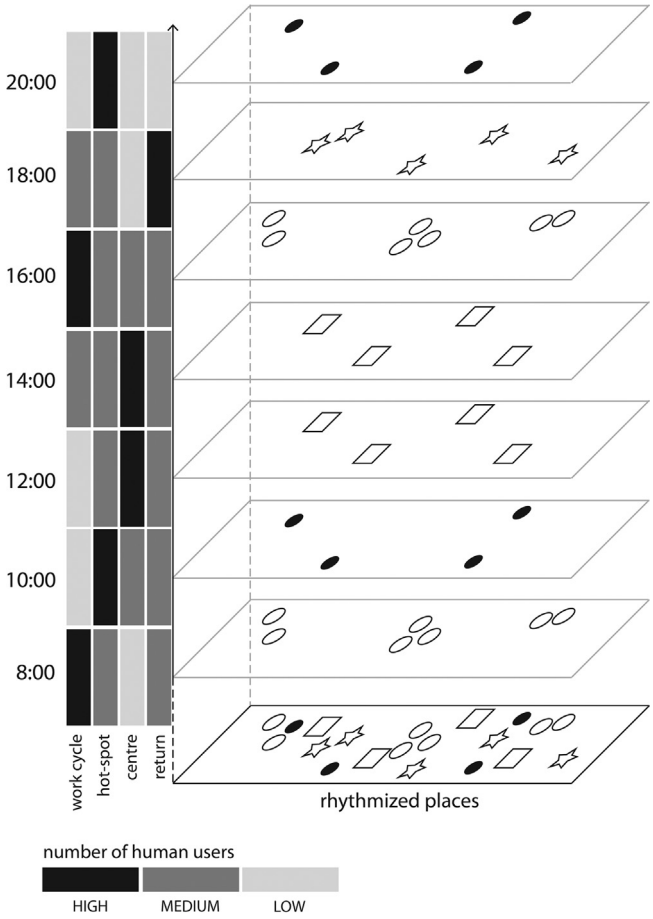

Fig. 7. Urban chronopoles – ensemble of rhythmized dislocated places.

we acquired. It is more than likely that when increasing the number and especially heterogeneity of observed localities, new chronopoles would start appearing. It is also likely that, based on new data, some of the formerly relatively homogeneous chronopoles would have to be divided into two distinct chronopoles and so on. The chosen approach, however, offers an example of a methodological and empirical way of using

chronopolis on the city-scale level, and shows a possible way to understand the diversity of an urban environment employing the temporality of individual localities. In the other words, the concept of a city's chronopolis has the potential to go beyond reductionist approaches to the city – reductionist in terms of viewing the city either only through its spatial structure or solely through its temporal pattern. Chronopolis prefers, conceptually, neither the description of temporal heterogeneity while neglecting the spatial variability of the city (one place), nor the description of spatial heterogeneity suppressing the notions on the variability of times (one time, one moment). As chronopolis does not prefer space over time and vice versa, it can be employed to cover temporal as well as spatial specificities of particular urban places from the spatio-temporal standpoint. Moreover, there is still a synthetizing effort to follow the relations and couplings between particular city time-spaces in order not to lose the city-scale spatio-temporal awareness while also respecting inter-city variability and differentiation. Urban chronopolis represents an opportunity for urban theory to approach the city in an integrated spatio-temporal way, pushing aside perhaps overly simplistic images depicting the city as one time, one place, one place in various times, various places at one time, or as various places at various times without any mutual relations.

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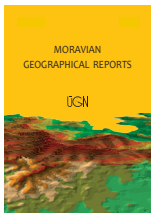

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DE GRUYTER OPEN

Rhythm of urban retail landscapes: Shopping hours and the urban chronotopes

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Abstract

Daily rhythmical patterns in the city are investigated in depth in this paper. The city is conceptualised here as a cyclical process and described by a sequence of relatively stable spatial-temporal stages. The concept of a chronotope is incorporated in the analysis of retail opening hours in the middle-sized city of Brno (Czech Republic), in order to identify distinct fusions of specific times and specific retail places and to examine their position within the daily rhythms of the city. There are distinct time-space retail configurations (chronotopes), which play crucial roles in the social negotiation and imagination of basic temporal categories, such as early morning, late morning, lunchtime, afternoon, evening, as being taken-for-granted in the urban context. More generally, the paper offers an example of the ways in which the specific daily rhythms of the city are produced and structured.

Keywords: *retail, urban rhythm, urban time, chronotope, opening hours, Brno, Czech Republic*

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1. Introduction: retailing in the post-industrial city

The rise of the modern industrial city engendered qualitatively new social relations and patterns accompanying industrialisation processes when compared with the pre-industrial era (Saunders, 1985). For a long time, the issues reflected in urban research were focused predominantly on the production aspects of urban industrialism – urban production functions were taken as key agents of urban development and internal urban differentiation. Indeed, it is not surprising as productive industrialism as a mode of urban labour reproduction and capital accumulation became deeply rooted into daily urban routines, in the social stratification of the urban population and in place-making in city space (Byrne, 2002). It was Castells' theory of collective consumption that drove research foci to the city itself. According to Castells (1977), exclusively urban issues do not arise from the productive role of cities but from their exclusiveness within consumption processes. Cities are places where the state is systematically engaged in the reproduction of labour through the supply of collectively consumed goods and services. Therefore the elementary urban processes are no more purely industrial: urbanity and city-being relates increasingly to the various processes of collective and individual consumption. Likewise, Baudrillard (1973) contends that while the industrial system socialised the masses as labour power, further societal development promotes their consumption power.

Consumption activities produce and remodel urban structures in different ways compared to industrialisation processes. The emergence of new types of goods with different geographical distributions within the urban space, the conflict of new commodities and ways of their consumption with the traditional local milieu, the production of new spaces of consumption replacing the former dominant spaces of production, as well as new emerging forms of social stratification based on cultural factors and consumption patterns – these are some examples of the various ways in which consumption patterns interplay with the physical, social or functional urban structures (Herrschel, 1999; Crewe, 2000). Rather than industrial production, consumption activities bring new post-industrial focal points like shopping malls, hypermarkets and leisure parks (Jayne, 2006), transforming the meanings, times and rhythms of the old urban places and attaching new functions and symbolism to them.

Urban consumption represents a complex tissue of overlying consumer spaces and rhythms. While the industrial city has been frequently depicted as a well-

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synchronised time machine or isorhythmia (Lefebvre and Elden, 2004), the urban post-industrial period has been seen as desynchronised, destandardised or polyrhythmic in temporal terms (Paolucci, 2001; Stavrides, 2013; Mulíček, Osman and Seidenglanz, 2016). Urban commerce becomes a more and more influential agent of urban everydayness and leaves deep imprints in the spatiotemporal organisation of the city (Kärrholm, 2009, 2012).

This article aims to conceptualise the city as a cyclical repetitive process through chronotopic analyses of retail opening hours. In spite the fact that retail represents just one part of the broad set of urban consumption activities, we argue that it contributes significantly to the overall rhythmicity of the city. While the spatial anchoring of urban retailing and shopping is given by the physical location of particular retail units differing in terms of retail floor area and the assortment of goods, the category of retail temporality includes the opening hours of shops. Employing the extensive datasets on the retail network in the Czech middle-sized city of Brno, we conceptualise particular stores as specific urban places, which can be grasped through their spatial as well as their temporal dimensions. We introduce the concept of chronotope in order to identify distinct fusions of specific times and specific retail places and to examine their position within the daily rhythm of the city. In this sense, we argue that open shops occupying specific urban places and times are very significant institutional agents defining and delimiting particular stages within the course of the day in the city. The message of the article thus consists in the description the distinct time-space retail configurations (chronotopes), which play a crucial role in the social negotiation and imagination of basic temporal categories, such as early morning, late morning, lunch time, afternoon and evening, as being taken-for-granted in the urban context (Jauhiainen and Mönkkönen, 2005; Jauhiainen, 2007). At the theoretical level, the paper aims to find and differentiate the ways of describing the time-space of the city or, more specifically, to diversify the spatiotemporal description of the city. This theoretical ambition is formulated by the following research questions: "How does one describe the temporal heterogeneity of the city?"; and "How does one describe the city in spatiotemporal terms?".

2. Theoretical background

2.1 Retail strategies

According to de Certeau (1984, p. 38) the strategies are "actions which, thanks to the establishment of a place of power, elaborate theoretical places (systems and totalising discourses) capable of articulating an ensemble of physical places in which forces are distributed", while 'tactics' is seen as "procedures that gain validity in relation to the pertinence they lend to time – to the circumstances which the precise instant of an intervention transforms into a favourable situation". He considers strategies, to certain extent, as the spatialised settings for time-space tactics. The location of retail premises within an urban territory, their opening hours throughout the day, week and year, can be thus viewed as the rational power places of commercial strategies – fixed however not only in space, but also in time.

A considerable body of literature has been devoted to the purely spatial aspects of retail location strategies. Spatialised strategies still represent a well-established research field, however, somewhat fading within the discourse of the so-called reconstructed retail geography (Crewe, 2000). On the other hand, the temporal aspects of retailing seem to get increasing attention from researchers, as well as from political viewpoints.

Time policies (or policies of time) are gradually being introduced, principally in the European countries. Their core concepts are relatively diverse, however, as they come from different contexts (most often represented by urban planners, architects, sociologists, geographers and economists) and as they reflect some specific time-cultures of particular countries. In the UK, time policy is understood as part of a wider concept of geopolitics (Klinke, 2013), while in Italy it is seen as a tool for setting equal opportunities for different population groups (an emphasis is placed mainly on gender equality: Bonfiglioli, 1997; Mareggi, 2002; Pasqui, 2016). In Germany, time policies are used to coordinate and synchronise various services and functions of the state (Boulin and Mückenberger, 2005; Mückenberger 2011), whilst in Portugal they are primarily tools for planning and regulating mobility and accessibility (Fernandes, 2011; Fernandes and Chamusca, 2014; Fernandes et al., 2015). The French approach covers the issues of spatiotemporal planning and so-called "chrono-urbanisme", in an effort to respond to the social inequalities associated with the overall acceleration of society, with the irregularity of everyday activities, uncertainty, an unpredictable and difficult-to-plan future, as well as with time-stress (Ascher, 1997, 2001, 2008; Gwiazdzinski, 2014, 2015; Straw, 2015).

In the Czech Republic, as well as in the post-socialist countries of Europe, these policies are not yet developed at the official level. What is, however, typical and therefore unifying all these different concepts of time policies, is a participatory bottom-up principle: the specific contents of these time policies are derived from the particular needs of the community (Bonfiglioli, 1997; Goodin, 2010; Mückenberger, 2011). In this respect, there is a growing pluralism between different concepts of time. There are two concepts of time commonly used in the current practice of European time policies, namely urban time (linear, mechanical), and social time (heterogeneous and discontinuous) (Melucci, 1996; Hoffmann and Lapeyre, 1995; Hoffmann, 1997; Bonfiglioli, 1997; Mareggi, 2002; Stavrides, 2012, 2013; Pasqui, 2016). Social time is primarily understood as the behaviour of an urban society, including socially established rituals, habits, traditions and holidays. It can be perceived as a kind of timing of routinely repeated social activities such as daily getting up, eating, working, training, sports and relaxation (Adam, 1994, 1995, 2004). On the other hand, urban time is represented by the timing of urban services and institutions. We can consider the opening and closing times of various institutions, offices, schools, hospitals and, of course, shops, as classic representatives of urban time (Kärrholm, 2009, 2012; Fernandes and Chamusca, 2014).

The retail times and rhythms became important subjects of discussions, negotiations and regulations, which only reflect the changing societal and economic meanings of time, the loosening synchrony of modern industrial towns and the rising flexibility of post-industrialism. In this respect, Paolucci (2001) draws attention to the politics of time as attempts to grasp the power of time in the fragmented space of the post-industrial city. These politics can take a number of forms – they include global discussions on the effects of daylight saving time, local timetable planning activities in mostly Italian towns (Bonfiglioli, 1997; Mareggi, 2002), negotiations on time regimes in night-economy urban areas,

as well as shopping hours regulation issues (Wenzel, 2011). It is particularly the deregulation and extension of shopping hours in the course of the day and week, which since the 1990s is a vital issue raised not only in political debates but also reflected in academic research. This issue was seized mainly by economists and thus somewhat narrowed down to studying the relationship between the hours of retail operation and consumer demand and the diversified impacts of deregulation on the competitiveness of retail premises (Wenzel, 2011; Inderst and Irmen, 2005; Lanoie, Tanguay and Vallée, 1994). The studies revealed in general "a strategic uncertainty between decision-makers in the retail sector" (Kosfeld, 2002, p. 52), concerning the temporal coordinates of their businesses. Temporal strategies cope with a plethora of changing work schedules, family responsibilities and the schedule-independent shopping tactics of consumers (Kaufman and Lane, 1994), and deregulated retail time-space thus hardly shows any clear patterns.

Kärrholm (2009) identifies two groups of processes through which retail activities shape the urban time-space – synchronisation and territorialisation: they can be called strategic in de Certeau's approach. There are several more or less clearly pronounced synchronisation strategies described in his case study of the city of Malmö, including synchronisation to the rhythms of other commercial subjects, to peoples and collectives. Kärrholm points out that purely temporal synchronisation processes go inevitably hand in hand with spatial localisation and synchorisation. Retailing introduces specific rhythms and synchronicities into specific territories, imposing a kind of spatio-temporal order on them. From this point of view and in accordance with Kärrholm, this study will not be interested in retail customers' tactics, i.e. in the social demand time of the shoppers. On the contrary, the subject interest here lies in the analysis of the strategies of retailers that are represented by the offer urban time of retail.

2.2 Chronotopic approach to retail rhythms

Urban everydayness consists of numerous repetitive actions, situations and movements which fuse together to orchestrate overall city rhythmicity – a relatively stable syntax of places and times whose reproduction is driven by various schedules and timetables. Lefebvre treats rhythms as measures sui generis, specific analytical standpoints capable of structuring the urban environment in terms of its time-spatial unity, manifestations of (de) synchronised and (de)synchorised routines (Lefebvre and Elden, 2004). Lefebvre and Elden, however, do not offer particular analytical and interpretative tools enabling an operationalisation of rhythmanalysis. Some authors, such as Folch-Serra (1990), Holloway and Kneale (2000) or Crang (2001), draw attention to the concept of chronotope developed by Russian philosopher and literary critic Mikhail Bakhtin. The chronotopic approach emphasises the dialogue between specific times and specific spatial settings. A chronotope can be understood as an analytical unit materialising (spatialising) time and, at the same time, timing space. Neither time nor space are privileged categories here – both of them are inseparable and mutually interwoven constituents of specific time-space (Bakhtin, 1980, 1984, 1986, 2002). Bakhtin himself employed the chronotope concept to outline a typology of situations in novels, pointing out its representational importance (Folch-Serra, 1990). From a geographical point of view, a chronotope is defined by rhythmic presence, co-presence and absence of people, objects, noises and smells taking place in a concrete place and concrete time (Crang, 2001, 2005). Seen from a research perspective, it is the analytical frame organising the viewpoint, scope and scale of the enquiry.

A chronotope represents a "distinctive bundle of time and space" (Harvey, in Folch-Serra, 1990, p. 264) grasped through narration, which interlinks present people, processes and activities into a single, interpretatively convenient time-space unit. Binding the units together, we can narrate the spatially differentiated temporality of the city, its rhythmicity and tempo. In our case study, the chronotope concept is implemented within the specific segment of retail time-space. The dialogical nature of the retail chronotope(s) stems from multi-layered and multi-scalar linkages between the spatial and temporal dimensions of the retail strategies taking place within specific urban context(s). Lefebvre's well-known notion of rhythm as the interaction between place and time can be invoked here, highlighting the crucial role of rhythms in the appropriation and negotiation of urban time-space (Lefebvre and Elden, 2004).

3. Methodology

The empirical goal of this paper is to conceptualise a city as a cyclical repetitive process through the chronotopic analysis of retail opening hours. In other words, we aim to use the strategic location of retail facilities in space and time in order to conceptualise the city as a kind of a cyclical loop. The theoretical goal of the paper is closely linked to this empirical framing. It consists in a search for the differentiated ways of capturing the time-space of the city, especially with respect to the diversified spatiotemporal description of the city. The spatiotemporal description can be approached from a variety of perspectives. Firstly, the city can be structured into particular spatial areas with relatively homogeneous temporalities (time regions). The basic organisational principle of the analytical description is therefore spatial, exploring the city as a spatial mosaic, from one region to another (Mulíček, Osman and Seidenglanz, 2015). Secondly, the temporal view can be employed primarily in the sense that it produces a description of the city for particular time periods. Such a city description follows the logic of temporal ordering, approaching the city as a succession of different times coming one after another (Mulíček, Osman and Seidenglanz, 2016). These two perspectives, however, can be combined in many different ways (Mulíček and Osman, 2017).

This paper draws on the latter second perspective on spatio-temporal urban depiction as it puts the accent on temporal structuration. In this respect, the concept of chronotope is employed as a specific kind of time-space. Particular chronotopes are arranged and described in a time order which follows the daily cycle. The underlying motivation is to show the city as a dynamic process consisting of repeating rhythms, unstable and fluid in its essence. Considering the city as a loop of cyclically alternating time-spaces is, to a certain extent, a critical response to those imaginaries that represents city as static and timeless entity.

This approach also implies the design of the research, which has the character of a case study carried out in a single city. The purpose of the case study is certainly not to provide a generic description of city time-space. It is rather a case that allows the researchers to illustrate a certain conceptualisation of the city and the related types of its spatiotemporal description. Therefore, the choice of the city is not based on pre-defined criteria, but

is mainly driven by pragmatic motivations. The empirical part of the research was conducted in the city of Brno, the second largest city in the Czech Republic, with approximately 400,000 inhabitants and the destination of more than 100,000 daily commuters. Since the 1990s, the city has experienced a thorough deep transition from a socialist industrial production centre to a more diversified urban economy. The transitional period was marked not only by intensive de-industrialisation but also by the massive growth of retail and other consumer services, which were strongly marginalised during the socialist central-command economy. The socialist retail 'shortage' was compensated for after 1989, as the total retail floor space increased more than five-fold between 1989 and 2013 (Fig. 1) (Mulíček and Osman, 2013).

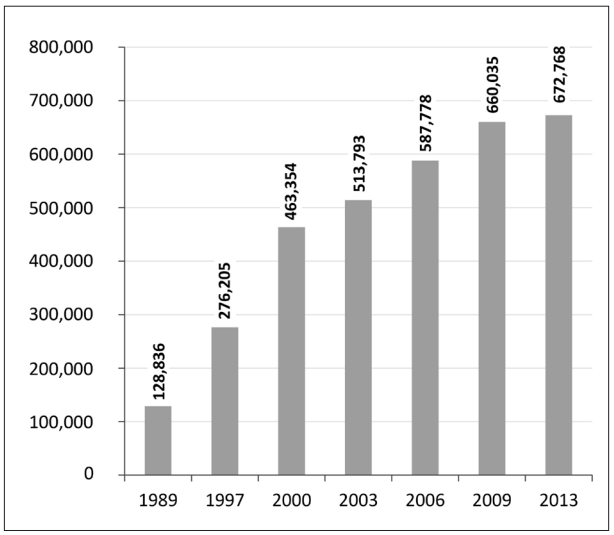

Fig. 1: The growth of total retail floor space in Brno 1989–2013 (m^2). Source: Mulíček and Osman, 2013

The decision to use data on the location of retail units to describe Brno's time-space was similarly pragmatic. In the case of the availability of similar data, it would also be possible to use, for example, data on the location and opening times of services, restaurants, withdrawals from ATMs, etc. The choice of the empirical database was motivated by its very existence, its public availability and the spatiotemporal character of the data. The city of Brno keeps the line of comprehensive municipal retail surveys taken quasi-regularly in 1997, 2000, 2003, 2006, 2009 and 2013. The surveys focus only on 'bricks-and-mortar' shops: mobile vendors' stands, e-shops, as well as pubs, bars and restaurants are not covered. We employ here the latest retail database from the year 2013 (Mulíček and Osman, 2013), including information on 3,587 shops in the city (Fig. 2). Each store is described not only by its retail floor space, but also by location, assortment and opening hours on weekdays, and (if open) on Saturday and Sunday. The dataset represents a useful analytical base for the identification and description of daily or weekly retail rhythms: it enables the researcher to link specific urban retail places with specific times in order to operationalise the chronotope concept.

The data analysis employed here follows the temporal regionalisation of the time-space of the city. In other words, the analysis inspired by Bakhtin's chronotope concept,

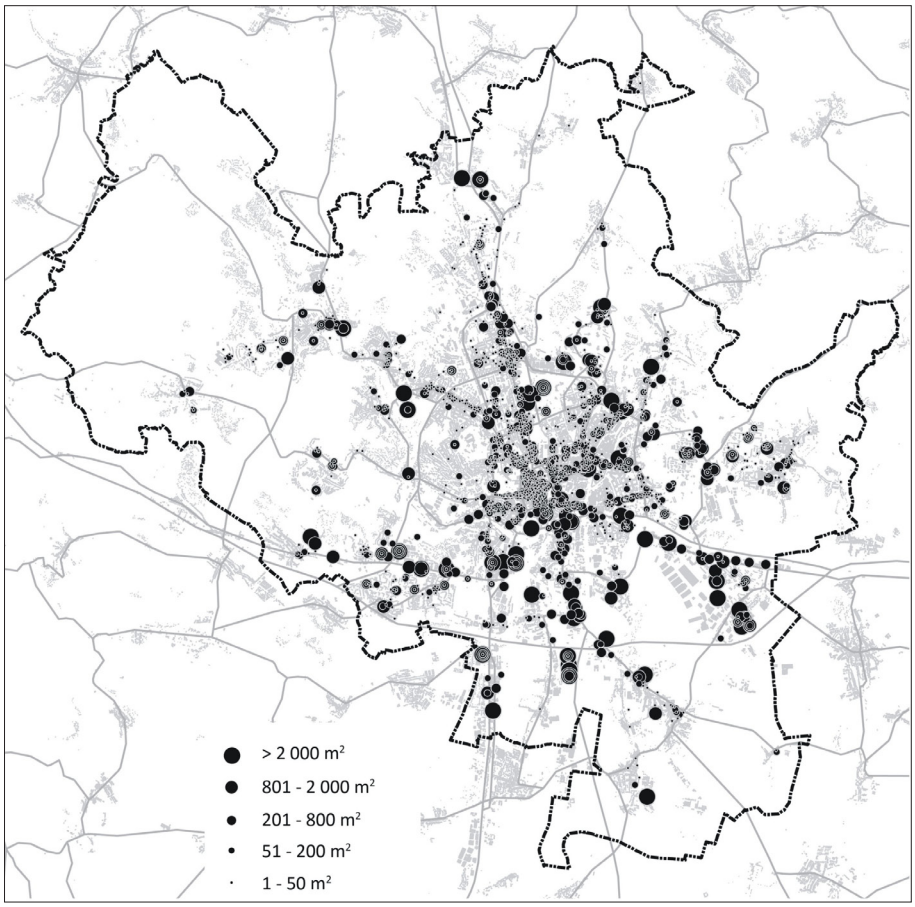

Fig. 2: The spatial structure of retail in Brno 2013 (store sales area, m^2)
Source: Mulíček and Osman, 2013

focuses on identifying changes in the behaviour of retail units over time. The first step in this chronotopic analysis was to investigate the basic distribution of the proportion of shops open during the working day (Fig. 3). Four distinct phases of a business day, based on the number of open retail units, were identified using this histogram: the first of these was the phase between 23 and 05 hours, which we call the night chronotope; the second is the phase between 5 a.m. and 9 a.m., labelled the morning chronotope; the third between 9 a.m. and 6 p.m. is called the day chronotope; and the fourth between 18 and 23 hours, is called the evening chronotope. In the second step of the analysis, four specific space time-spaces of Brno were identified (see Fig. 3 below). In the third step, the spatial dimension was added to each of the chronotopes defined – the shops opened in the relevant period were visualised on the map according to their specific location (Figs. 4–7 below). In the fourth and last step of the analysis, these chronotopes were individually described in the order in which they follow one another during the course of the day (Fig. 8 below).

4. Results and discussion

4.1 Weekday retail rhythm

The opening and closing of shops within the course of the day represent rhythms that aggregate various synchronisation strategies, reflecting not only the size, assortment profile and spatial location of particular shops but also other contextual temporalities produced by the numerous types of pacemakers. Figure 3 shows the weekday retail rhythm in Brno visualising the changing shares of open shops during the 24 hours of the day. An examination of the graph indicates the concentration of opening hours to the part of the day between 8–9 a.m. and 6–7 p.m. The beginning of the average opening hours on weekdays is at 8:39 and the end at 18:22. Stores operated during the late evening, night and early morning hours represent only a small segment of retail premises in the city. Leaving aside the clear and rather expected difference between light and dark hours, we can trace out other subtle temporal borders which separate specific and transient retail configurations. For example, the retail map of the early morning shows a distinct spatial and assortment pattern of shops compared to the retail structure in the middle or end of the day. The weekday urban retailing can be thus conceptualised as a sequence of short-term transitive configurations of retail, interwoven with other urban rhythms.

4.2 Night chronotope

A number of research reports concern night city economies: many of them are spatially targeted to specific parts of the city – the city centres or inner city zones. Night-time rhythms have been analysed in Groningen, Utrecht and Rotterdam (Schwanen, van Aalst, Brands and Timan, 2012), as well as the evening and night-time city centre activities in Swansea (Bromley, Tallon and Thomas, 2003) or the nocturnal life of Paris (Mallet, 2014). These studies mostly confirm the important role of retailing in the spatio-temporality of the urban night (together with night clubs, restaurants, pubs and bars, stops of night public transport, etc.). At the same time they also point out that night economies often clash with various forms of institutionalised time regulations, "police hours" or curfews.

As mentioned above, night-time businesses represent only a small part of the total retailing activity in Brno, in spite of the fact that there are no legal directives regulating night opening hours in the Czech Republic. From our data base, there are 14 stores operating non-stop, 3 stores open until midnight and 16 shops closing at 11 p.m. Two Tesco hypermarkets are the biggest shops with continuous opening hours in the city, with retail floor space more than about 10,000 square metres each, while the rest of the non-stop retailing involves very small stores not exceeding 80 square meters (one pharmacy, 5 groceries and 6 tobacconists, usually with extended offer of alcoholic beverages). There is, however, no universally valid narrative standing behind the temporal strategies of those non-stops.

When analysing the case of pharmacy, we can see the combination of spatial and institutional factors. The shop is the only pharmacy in the city where one can buy medicaments in the period of the night-time from 10 p.m. until 7 a.m. This night service is partially contracted by the city authorities as the pharmacy is situated in close proximity to all-night medical and dentist emergency rooms. The pharmacy represents, then, part of the semi-institutionalised and localised system of night health care. The specific spatiality gives birth to a specific temporality of the store in shaping its privileged and central position in the chronotope of night medical help. This

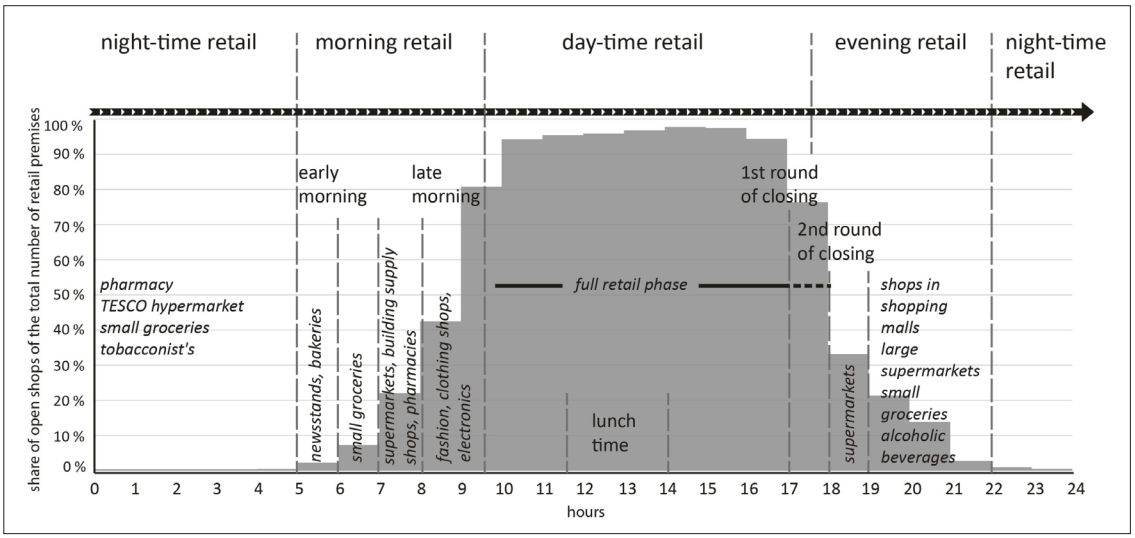

Fig. 3: The share of open shops of the total number of retail premises and the daily rhythm of retail configurations: Brno 2013, weekday. Source: Muličěk and Osman, 2013; authors' analysis

position is, however, rather transient – the store becomes just an ordinary item in the other 125 pharmacies in the city during the daytime.

The temporality of small non-stop groceries and tobacconists stems from adaptation to the local context. They mostly fall within the category of convenience stores targetting a specific group of night customers – usually people on their way home (from pubs and bars, from late night shifts, from the central train or bus station) or people working in the streets of the night city (taxi drivers, policemen and emergency ambulance staff, etc.). Some of these stores are located in central locations, some of them not, but we have to be aware that the term 'central location', borrowed from the geography of the daytime city, obtains different meanings on the nocturnal map. The night distorts the traditional city structure and 'centrality' gravitates towards a few animated and living places. All small non-stop stores under examination form the central locations sui generis, regardless their absolute geographical position. They are the night micro-clusters of people and activities, the foci of night spatial order, which fades away as the morning brings new focal points and centralities.

The Tesco non-stop hypermarkets can be examined as a third distinct typological case of night retail. Their time-policy in Brno reflects much more the Tesco global/national corporate strategy, not simply local factors. Tesco, which entered the Czech Republic in 1996, adopted the extra-long opening hours in order to strengthen its position within the highly competitive national retail market. Starting in 2005, Tesco introduced non-stop operations within the network of its hypermarkets in large and middle-sized Czech cities. This policy of 24/7 retailing was not followed by other important chain retailers in the Czech Republic, and Tesco employed it as a powerful marketing tool to demonstrate its responsiveness to the (temporal) needs of customers. The high economic costs of night retailing forced Tesco to revise the policy at the end of 2015. Only six hypermarkets (mainly in Prague and Brno) continue with the 24/7 service, while the other 19 stores cut their opening hours in accordance with the effective demand of customers. Tesco non-stop stores in Brno can thus be perceived as indicators of the day-and-night living urban economy which cannot be found in smaller Czech cities and towns. The "colonisation of the night" (see Melbin, 1978) by Tesco is not, however, just a pragmatic economic strategy of retail synchronisation with the schedules of time-poor people: it embraces an important neoliberal symbolism, presenting Tesco as the modern retailer which breaks the spatiotemporal borders of traditional retail niches.

The retail times and places contribute significantly to the building of the night-time Brno chronotope. Non-stop retailing privileges a limited number of urban places, producing a specific night geography of the city. The few non-stop shops represent hotspots, regardless of their size or location, just because they are few in number. The different groups of customers are spatially joined, as the temporality meaningfully defines spatiality within the spatiotemporal order of the night.

4.3 Morning chronotope

The frontier between night and day in the city is never clear, more likely it takes the form of a kind of buffer zone. Looking at Figure 3, we can make the wide night-day retail divide approximately between 5:00 and 9:30 a.m. While a little over 2% of shops open before six o'clock, the share of open stores growths steeply in the next three and half hours and after 9.30 a.m. more than 80% of shops in the city are open.

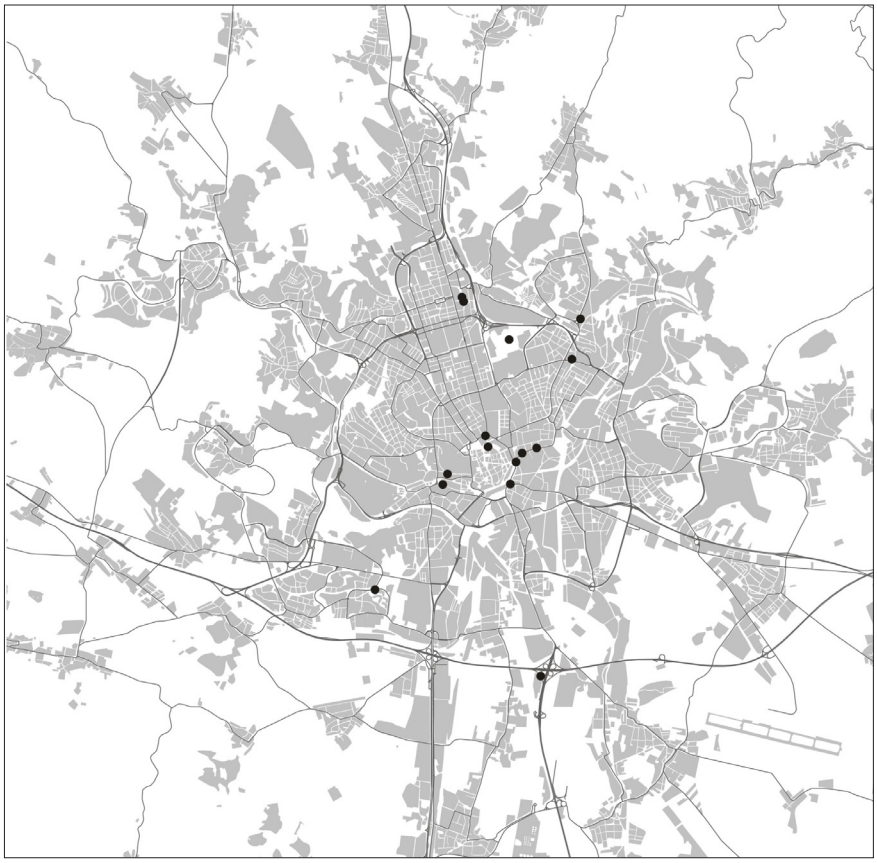

Fig. 4: Night chronotope of Brno in 2013 (1:00–1:59)
Source: authors' analysis

This everyday rhythm of the morning retail awakening has its internal and quite rigid spatiotemporal structure. The times before 6 a.m. are occupied by a group of shops rather homogeneous in term of assortment and size structure – newsstands and tobacconists represent about two-thirds of the 65 shops open before 6 a.m., while the remaining one-third involves only small groceries and bakeries. All these early morning stores show a common feature which lies in their definitional quality, a daily repeated tie to the coming of a new day. Their principal goods, like newspapers, fresh bread and rolls, symbolise circadian rhythm and the stores are the places where this rhythm is materialised and amplified. The early morning shops are to be found mainly at the public transit hubs, fusing with the rhythms of early work-commuters, most typically industrial workers, medical staff and any other employees starting their work ahead of commonly-accepted hours.

Another 180 stores open between 6 and 7 a.m. This round of openings is clearly dominated by grocery stores, still small in size. The assortment structure, however, becomes more diversified. There is an increasing number of stores which provide materials and equipment to self-employed tradesmen or small businesses (plumbers, electricians, bricklayers, etc.). We can find also several green-groceries opening. It has to be pointed out that the early morning retail is not corporate in its nature. Most of the grocery shops working before 7 a.m. are not part of retail chains: their temporalities refer more to autonomous local strategies than to rather uniform top-down time policies.

In the period between 7 and 8 a.m. here is a further structural diversity of retailing, both in terms of assortment and size. The map of grocery stores demonstrates higher densities: not all opening premises fall under the small-sized shops category, as seven o'clock is the usual starting time also for middle-sized and large grocery shops and supermarkets. Many of the latter belong to the wider retail chains, applying nation-wide opening times strategies. The changes in the structure of to-date opened shops go hand-in-hand with the increasing number of potential customers. The people on their way to school or to work are no more the sporadic representatives of marginal temporalities, they represent the accepted temporal norm. At this time of the day, the 'normal' working day starts and retail temporality fuses closer to the mainstream rhythm of the city. For example, there are many pharmacies opening, as well as building supplies stores, drugstores and car components shops. These stores follow a similar logic in that they are tightly linked to the pragmatic daily activities of their customers or interlinked businesses. A good example is the opening hours of pharmacies, which closely resonate with the typical morning-oriented working time of most of healthcare facilities – medical centres and clinics, as well as small doctor's offices. Late morning retail seems to be much more a pragmatic reflection of the other urban rhythms than an active pacemaker, which to some degree is contrasted to the role of night or early morning retailing.

After 8 a.m. the number of open shops rises steeply and by about 9.30 a.m. approximately 80% of all retail premises in the city are open. The spatial pattern of city retail is nearly completed and the assortment range reaches its maximal width. This is the stage when the 'leisure shopping' assortment (fashion, clothing stores, electronics, etc.) appears for the first time, and moves the relation between retail place and retail time further. While the unique temporality of night and early morning shops has a definitional meaning for them, the shops opened later on in the morning lose inherently their temporal exclusivity and their spatiality obtains the overriding significance.

Fig. 5: Morning chronotope of Brno in 2013 (7:00–7:59)
Source: authors' analysis

IKEA, the home furnishings retail chain, moved the opening hour for all its Czech stores from 10 to 9 a.m. in the autumn of 2013. The motive of the change was to place better the store into its temporal, as well as spatial context:

> "…new opening hours better correspond with the needs of our customers, we can satisfy their expectations. Especially families with children like morning shopping. Long-term surveys show that people launch their shopping trips in the morning and they do not use the last hour of our shopping hours as much. Most of the shopping centres in the vicinity open also at 9 o'clock so we believe that the change will be accepted positively..." (IKEA, 2013).

This example from the IKEA store shows the great volatility of morning synchronisation factors and, at the same time, their vitality in economic and marketing terms.

4.4 Day chronotope

The phase in which almost all shops are open starts after 10 a.m. in Brno. More than 90% of the total number of stores are working and this full retail period lasts till 5 p.m. The data describing these particular seven hours of city retailing represent a referential configuration without any distinct temporal, spatial or structural markers – a kind of normative mirror level in which more specific chronotopic patterns of other parts of the day can be reflected. The particular time coordinates of opening hours cannot be linked to specific shops in specific places in this stage. The binary information of 'open/closed' loses some of its interpretive power as the chronotope of the (10–17) city stems from the totality of city shops, nearly all of them open and working.

The period from 10 to 17 o'clock appears to be quite monolithic when seen through the optic of retail activity. A question arises as to what extent this segment of retail rhythmicity entrains with other rhythms of daily urban life. There are several pace-making moments within the 10-to-17 timeframe, among which the 'lunch-break' is prominent as it belongs to the most common temporal fixes structuring that respective part of the working day in the city. The lunchtime usually means a pause in work, the interruption of flowing working time. Examining the graph in Figure 3, however, there is no visible imprint of lunchtime in the retail opening hours dataset. We can find out that only about 10% of all shops stay closed for a more or less short lunchtime break. These are mainly very small retail premises (up to 50 m^2 retail floor) spread across all assortment categories: the pause usually takes place between 11:30 and 14:00; its average duration is 1 hour; the pause from 12 till 13 is the most typical case. The prevailing absence of a lunch-time break indicates that retail schedules are not a mere mechanical reflection of broadly synchronised individual temporal strategies. They are, instead, the outcomes of an interplay between customer needs, the operative economy of the shop and its synchronisation strategies.

4.5 Evening chronotope

The 'full retail' part of the working day ends at 5 p.m., when the first massive round of shop closures starts and the share of open shops falls to 76%. It seems that the "rule": 'first open, first closed' cannot be applied in this case, as the majority of shops closing at 17 o'clock show an average or even late opening times. As this set of shops includes mainly small- or middle- sized retail businesses in non-central localities, we can hypothesize that their opening hours follow closely the typical 8 or 9-hour working shift

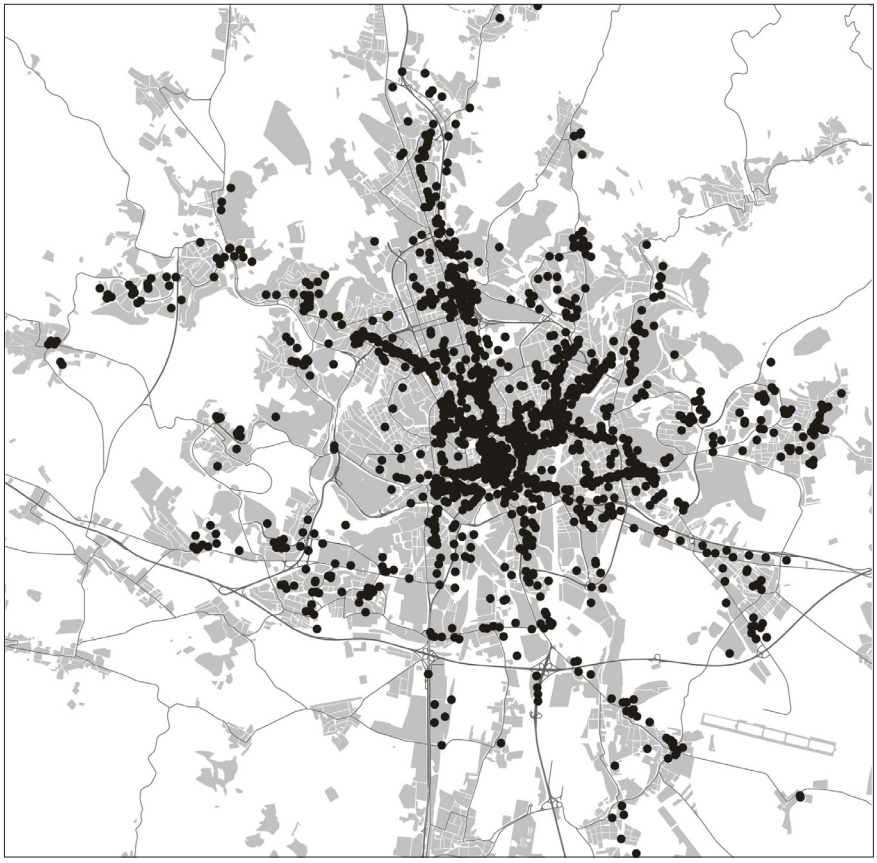

Fig. 6: Day chronotope of Brno in 2013 (12:00–12:59)
Source: authors' analysis

of shop assistants or shopkeepers. If so, the institutional pacemaker of working hours is directly transferred this way into urban retail temporalities.

The second round of closures takes place at 6 p.m., after which only one third of stores in the city stay open. This is actually a sharp decrease, perhaps remotely resembling retailing temporality under socialism – as in those times, 18 o'clock was the typical closing hour imposed by the regulated central-command economy. With no research data, we can only speculate on possible inertias of retail temporalities being carried on to the unregulated post-socialist urban context of the contemporary Czech city. In any case, this evening time denotes a definitive break with the period of ubiquitous retail. The chronotopic retail map starts to be more fragmented and the question of "Where to shop?" becomes more closely linked to "What time is it?". As for the size and assortment structure of the open shops, they reflect the logic of flows of people in the city. For many, this is the time to make their daily shopping on their way home. Such a spatiotemporal constellation of customers favours larger supermarkets and hypermarkets located nearby the residential areas and transport lines, while the small specialised shops are likely to close. The average size of the open shops thus increases when compared with the time before 6 p.m., and the grocery assortment becomes relatively over-represented.

In the period from 7 to 10 p.m., the process of transition to the night-retail chronotope comes to its final stage. The number of working shops decreases gradually and the size structure of the retail units becomes more polarised as the stratum of middle-sized shops fades away. The large shops are represented by an assortment mix of businesses run under the umbrella of large shopping malls, which stay as a kind of temporal island amidst a pervading retail desert. Furthermore, there are also retail chain supermarkets carrying on the role of late evening retail points operating at the scale of residential neighbourhoods. They usually close between 8 and 10 p.m. The late evening opens the space also to small businesses with specific temporal strategies aimed at minor groups of late customers. Stores selling alcoholic beverages and cigarettes, as well as small groceries offering a narrow range of foodstuffs, are the typical representatives in bringing the city retail back into its nocturnal phase. At about 11 p.m., the working-day rhythm of retailing draws to a close and the night-time chronotope comes into its own right.

5. Conclusions

The authors do not see the city as a static product of past processes. Instead, the city is conceptualised here as a dynamic continuing process, as an entity being always in flux. The processional dynamism of the city environment, as presented here, is not linear in its nature. It is conceptualised as an ensemble of rhythmically repeating stages, with each stage enclosing a specific configuration of city functioning. The delimitation of these stages represents the main result of the underlying analytical work. The chronotopic approach introduces a temporal categorisation, dividing the 24-hour day into differently timed sections. Time can be partitioned into the years rhythmised by the cycle of particular seasons, into the weeks timed by the alternation of working and non-working days, or into the days which rhythm refers to in the schedule of work or school. Time can be divided into even more subtle units, however, but still internally cohesive fractions within the temporal scale of the 24-hour day.

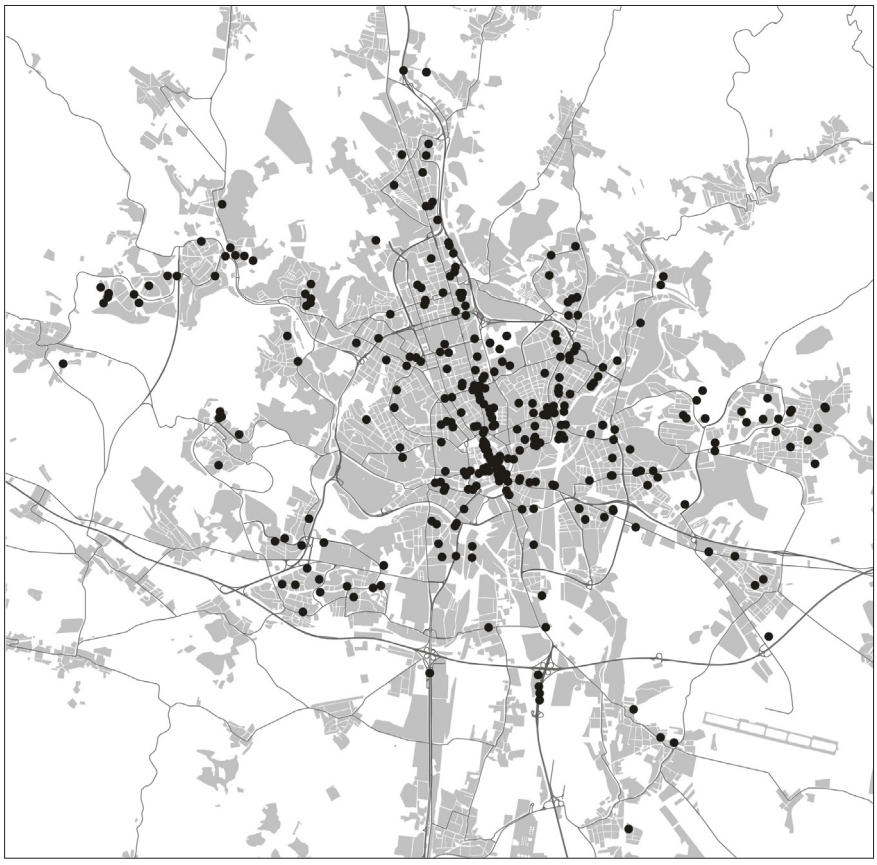

Fig. 7: Evening chronotope of Brno in 2013 (19:00–19:59)
Source: authors' analysis

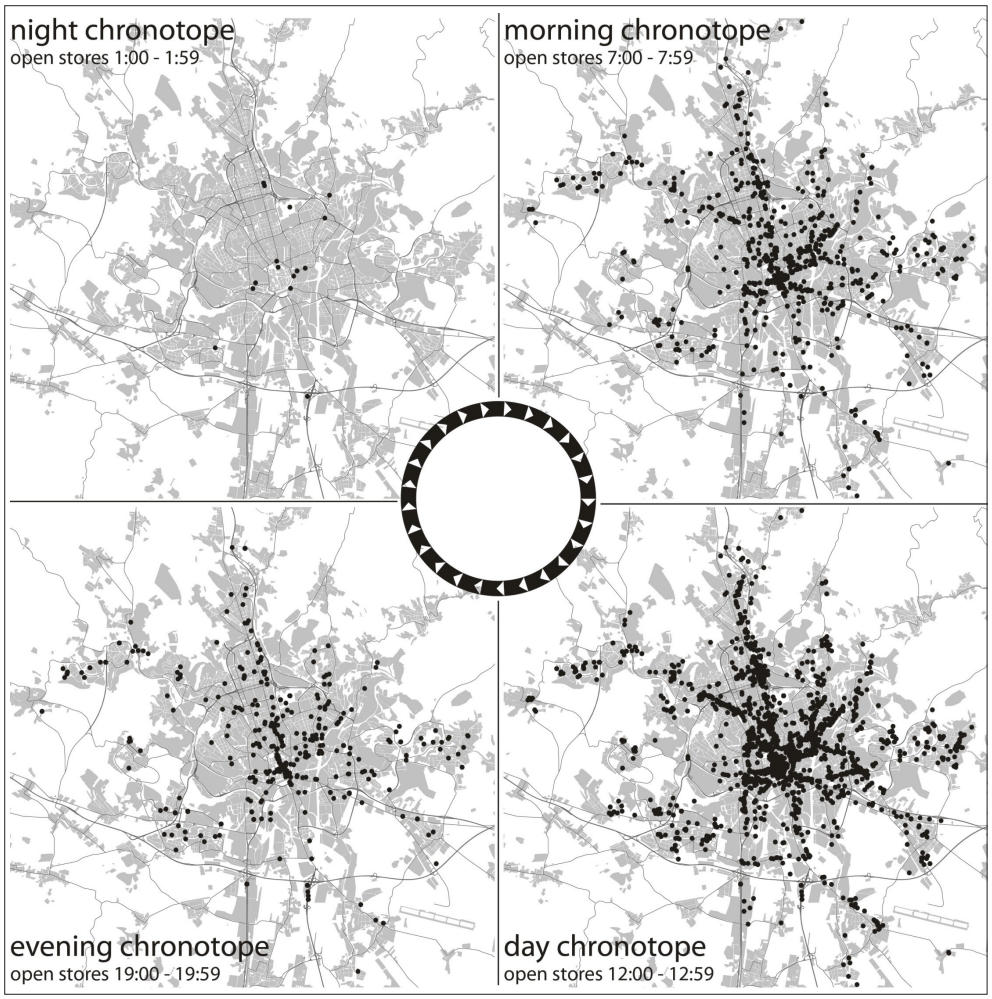

Fig. 8: Time-space description of Brno in 2013 as defined by the four chronotopes
Source: authors' analysis

This paper presents one example of an alternative division of the day: summarised as Figure 8. Based on the temporal strategies of retailers, four distinct time-space configurations have been delimited – chronotopes of the night, morning, day and evening. These four chronotopes are not linked to the astronomical structuring of the 24-hour day – rather, they are social constructs. While the beginnings and the ends of the astronomical day change over the course of the year, the temporal co-ordinates of retail opening hours remain relatively stable. The retail stores open each morning of the weekday typically between 8 and 9 a.m. and close between 6 and 7 p.m., no matter whether there is daylight or evening dark. There is a certain clash between particular conceptions of time – the rhythmically repeating biological need for sleep (human biological time) interferes with linearly flowing time, which is so essential for the organisation of modern urban society (the machine time of industry and bureaucracy). Daylight or darkness are not the meaningful factors shaping the 24-hour day in the present city: it is structured under different, socially-based rhythms, with the rhythms of retail as the prominent ones. There are no astronomical or biological markers, like dawn or the songbirds separating the chronotope of the morning from the chronotope of the night. There are instead significant social markers represented by the opening times of various urban services.

Analogically, the start of the spring in the city does not coincide with snow-melting and the germination of plants. It is linked to the start of the new seasonal offers of the retail chains (Jauhiainen and Mönkkönen, 2005; Jauhiainen, 2007). The concept of the city as a cyclical process repeated in daily rhythms is emphasised here. The city-as-process is described by a sequence of relatively stable spatial-temporal stages stemming from the specific temporal strategies of retail stores. More generally, the paper offers an example of the ways in which the specific daily rhythmicity of the city gets structured.

On a more general theoretical level, this paper can be seen as a contribution to a critical re-conceptualisation of urban time. The classical studies often separated social and urban time as they understand urban time usually as linear, divided into formalised basic units such as a 24-hour working day (Melucci, 1996; Hoffmann and Lapeyre, 1995; Hoffmann, 1997; Bonfiglioli, 1997; Mareggi, 2002; Stavrides, 2012, 2013; Pasqui, 2016). In this contribution, however, we have a different conceptualisation of urban time – cyclical urban time, which consists of rhythmically repeating periods that are shorter than a day. In the case of Brno, there are four time-specific periods, four chronotopes that emerged not from astronomically- or institutionally-constituted categories of night, morning, day or evening, but from particular the spatiotemporal strategies of urban retailers.

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ARTICLE

Chronotopes of urban centralities: Looking for prominent urban times and places

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Abstract

The aim of the paper is to discuss an issue of urban centralities not only in spatial but also in temporal terms. We seek to overcome the traditional view of urban centralities as materialised places. We argue that prominence of place is closely tied to a certain time regime or rhythm and that some prominent times tend to be spatialised through certain urban places. We emphasise the hybrid spatiotemporal nature of urban centrality that emerges from the inseparable coupling of the spatial and temporal dimensions of urban everydayness. The paper seeks to introduce timing, synchronisation and rhythms as important constituents of the urban tissue. The methodology links together Lefebvre-inspired rhythmanalysis and the concept of chronotope. A complex dataset that depicts the aggregated rhythms of people's presence in selected locales is employed to demonstrate multiplicity of prominent times present in the contemporary city. The chronotopes are narrated as recurrent situations in which specific urban locales and specific times are animated and linked together through the presence of interacting individuals. The elusive spatiotemporal centrality is reflected in the story of the chronotope, describing its rhythm, scale, pacemakers, and actors.

KEYWORDS

Brno, centrality, chronotope, everydayness, urban rhythms, urban timespace

1 | INTRODUCTION

The heterogeneity of various urban structures, whether tangible or intangible, and the complexity of human practices give rise to multiple, more or less abstract representations of the city at various scales—from the microscale of individuals' cognitive schemes to the macro level of political and planning urban models. Polarities and gradients are important building blocks of most of these representations because they structure complex images of the city, transforming the city into an understandable, manageable and plannable system (Bridge & Watson, 2000). Most abstract representations of cities in some way define centres and centrality. Urban centres are thought of as sorts of hubs, organisational nodes, or high-density clusters that constitute, and at the same time are constituted by, the underlying spatial matrix of urban everyday life.

Urban scholars frequently work with the idea of centrality—it is an important element in studies of the functional and symbolic organisation of the medieval town (Lilley, 2009; Mumford, 1961), the starting point for numerous human-ecological or Marxist abstractions of the city of the industrial age (Gottdiener, 1985), as well as the subject of critical

reflection in more recent discussions of intra-urban polycentrism (Berry & Kim, 1993; Graham & Marvin, 2001). Among other things, centrality is a semantically multi-layered concept; it only becomes meaningful when assigned to a specific context because there are many possible answers to the question "in what sense is something central?". Old city squares, historical downtowns and even shopping malls are places of materialised centralities whose physical forms correspond to their functional roles within the broader urban layout. We also encounter centres that are not so clearly expressed in physical terms but still have a strong presence within lived urban social space—transport hubs, city parks or playgrounds, for example. Furthermore, at the urban microscale we can find numerous other centralities and central places that organise individual lived spaces; these are central places relevant only for a limited scope of users and their representations of urban space. Material imprints of centrality often fuse with intangible urban imaginaries and their symbolic centres—inter-subjectively accepted central places are confronted with "private" micro-centralities of individual everyday life.

Porta and Latora (2007) proposed the concept of prominence to be a universal defining feature of centrality, distinguishing between cognitive and geographic prominence. Whereas geographic prominence reflects the location of a particular place within the broader spatial urban settings, cognitive prominence emerges from people's mental urban landscapes shaped by individual practices, memories and meanings. These two dimensions of prominence interweave, producing complex, albeit still rather spatially embedded representations of urban centres. But is the specific spatial situation the only principal descriptor of urban prominence? Is the concept of prominence associated solely with just urban space? We argue that just as prominent places can be delimited, so too can prominent times—temporal centralities interwoven deeply into the lived urban fabric.

In this paper, we examine prominence in urban everyday life from the standpoint of time geography. We seek to overcome the traditional view of urban centralities as materialised places; instead of the spatialised concepts of centrality and prominence, we discuss temporalised ones, free from analytical stereotypes enrooted in urban morphology approaches. Simply put, our objective is to explore central urban times. We do not consider central or prominent urban times to be analogies or counterparts of central urban places. Instead, we argue that prominence of place is closely tied to a certain time regime or rhythm and that some prominent times tend to be spatialised through certain urban places. Hence, the hybrid spatiotemporal nature of urban centrality emerges from the inseparable coupling of the spatial and temporal dimensions of urban everydayness. We aim to apply the concept of chronotope to illustrate the depth in which timing and rhythms enter the making of the urban place.

2 | THE NATURE OF URBAN SPACE AND TIME

The interconnection between the temporal and spatial dimensions of urban everyday life is an important characteristic of what Egenhofer and Mark (1995) call naive geography. The term naive here refers to lived social practices grounded in individual experience and unscientific reasoning, both spatial and temporal. Living in the city requires urban dwellers to adopt various forms of synchronisation and synchorisation tactics within various systems of encounters and communicative actions (Netto, 2017). Shields notes that:

> ... the status of the urban is not merely an abstraction, a theory, but a logic that is temporal and spatial ... [S]ettlements not only involve coordination around the tolling of bells and clock time but have distinctive temporal rhythms that correspond to the coordination of urban populations: rush hours, opening and closing times of businesses and schools, market days, festivals and parade days, curfews ... (Shields, 2013, p. 29).

The need for spatiotemporal coordination is a symptom inherent to functional and social heterogeneity of urban society, as outlined, for example, in the Durkheimian concept of organic solidarity, which is based on complex interdependencies and exchanges (Thijssen, 2012). The spatial and temporal anchoring of various social practices, whether individual or collective, gives rise to social space and social time (Gurvitch, 1964; Thrift, 1977), which is far removed from the concepts of Euclidean space and mechanical clock time. Both social space and social time should therefore be seen as products of multi-layered urban life, and at the same time, as a medium through which everyday affairs acquire social meaning and ordering (Hassard, 1990; Mumford, 1961).

However, just as there is no one unitary urban social space, uniformly lived and appropriated by all urban actors, there are also multiple realms of urban social time that intertwine to form a semi-coherent whole (Crang, 2005; Harvey, 1990). Lewis and Weigert (1981) present a more nuanced differentiation of social times, emphasising their multiplicity and interconnectedness as key features. They distinguish two times at the microscale: self time as a temporal framework that

shapes rather subjective and individual experience of the past, present and future, and interaction time representing the temporal organisation of individual contacts and synchronicities. Interaction time is a kind of interface through which individual social practices become a part of collective social acts, and at the same time, get attached to specific locales (Lynch, 1972). Lewis and Weigert (1981), in this sense, speak of time embeddedness, which involves not only coordinating different self times but also individual adapting to macro-scale, institutionalised temporal orders. The institutionalisation of urban times and rhythms primarily refers to the influence of organisations (schools, factories) and codified cultural norms (calendars, holidays) on the collective time regime. Institutionalisation also involves the sharing and intersubjective communicating of spatiotemporal habits, routines and meanings among individuals (Edensor, 2006). These two strands of institutionalised temporality fuse with individual spatiotemporal tactics, imposing some coercive patterns of everyday normality, continuity and predictability on them (Edensor, 2010a; Madanipour, 2017). As a result, urban society is markedly synchronised and synchorised; Parkes and Thrift (1979, p. 361) call it "a periodic environment," referring to the recurrent nature of collective spatiotemporal routines reflected in distinct urban rhythms. Urban everyday life is a polyrhythmic ensemble of overlying individual rhythms (Paiva, 2016; Paiva et al., 2017) that is more or less orchestrated by place-based social schedules. They produce the typical space-time regime, which is conceptualised by Cachinho and Paiva (2021) as a kind of territorialised temporal structure of each individual urban place (e.g., street, neighbourhood, city) or community (Brighenti & Kärrholm, 2018; Osman & Mulíček, 2017; Stavrides, 2013).

Arising from repetitive acts and events, urban rhythms represent cyclical time—time that is attributed by many authors primarily to traditional agricultural or early urban societies. In contrast, urban modernity is usually associated with the linear passage of time, continuous evolution and progress (Madanipour, 2017). However, these two concepts of time are not necessarily contradictory, as Lefebvre and Levich (1987), Meyer (2008) and Crang (2001) pointed out. They describe a continuous negotiation between the stability of cyclical urban patterns and the progress rooted in linearly conceptualised modern urban time. According to Lefebvre, "... time and space, the cyclical and the linear, exert a reciprocal action: they measure themselves against one another; each one makes itself and is made a measuring-measure..." (Lefebvre et al., 2004, p. 8). Urban rhythmicity can therefore be employed as an analytical concept. It allows specific social practices, specific places (topos) and specific times (kairos) to be grasped as mutually defining entities, not necessary related to the abstract metrics of geometric space and chronological time (Crang, 2005; Rämö, 1999). The vast majority of urban rhythms are embodied in territorialised ones, linked not only to the diurnal or seasonal beats of the human body, but also to the repetitive movements of bodies in the urban space (Brighenti & Kärrholm, 2018; Edensor, 2010b). Recurring corporeal presence and absence, albeit increasingly mediated or even replaced by modern communication technologies (Caron & Caronia, 2007), still remains one of the most profound and materialised pieces of evidence that rhythms shape the lived urban timespace (Kärrholm et al., 2017; Lindón, 2013).

3 | TIMEFRAMES AND TEMPORALISED CENTRALITIES

According to Adam (2008), it is necessary to pay attention to the structural features of urban cyclical time to grasp fully the role of rhythms in producing heterogeneous urban timespace. These features may include, but are not limited to, a timeframe, timing and sequence. A timeframe is a socially stable and self-contained timespan against the background of which we identify and analyse the course of rhythms—typically, a day, a week or a year. Timing concerns coordination strategies and the people's tactics of interaction time that address diverse synchronisation needs and norms; there are usually several collectively accepted timings in the city that reflect the beats of specific pacemakers and represent the underlying matrix of city-wide rhythms. Finally, sequence means the temporal ordering of activities and, from the geographic perspective, the chronological order of places that are part of a specific rhythm.

The recurrence of everyday urban life is usually framed in mutually intertwined timespans of various length. They are lived through a complex mix of short and long rhythms emanating from the stable sequences of semi-regular events, and at the same time, they are abstractly measured and delimited by clocks, calendars and chronicles. The year has always been an important timeframe indicating the deep-rooted link between the life of urban society and the cycles of agricultural production. Pre-industrial urban time was sequenced through events, festivities and rituals, both religious and secular that were prominent, rather stable temporal points within the annual cycle. They can be viewed analogously to Lynch's (1960) landmarks as collectively accepted temporal markers (Parkes & Thrift, 1979) that split up the annual cycle of urban life into distinct and understandable sections. The flow of time during the year was discontinuous, narrated more than depicted and spatialised (Le Goff, 1980). As the merchant city developed into the proto-industrial and industrial city, time, especially labour time, became more accurately measured, standardised and valued (Harvey, 1985).

The linkage between timing of the urban life and specific events was weakened and partially replaced by the concept of homogeneous regular clock time. As Le Goff (1980, p. 48) points out: "Time was no longer associated with cataclysms or festivals but rather with daily life, a sort of chronological net in which urban life was caught...".

The day is understood as a temporal region inherent in daily routine—the basic timespan that is "naturally" defined by the alternation of light and darkness, by the diurnal rhythm of waking up and falling asleep (Lewis & Weigert, 1981). Its length reflects not only biological, ecological and cosmic cycles, but also sociocultural disciplination and power conditions (Adam, 2004) emanating from the unexceptional routine practices of urban life tightly connected with home, work, and habitual spatiotemporal patterns (Felski, 1999). Daytime used to be a primary ecological niche for most social practices (Melbin, 1978); it was safe and familiar (and therefore prominent) compared with the night. The sharp difference between day and night began to be erased in urban societies with the gradual improvement of lighting technologies, which made it possible to perform many activities in the evening or even late at night. Public lighting is an important symbol of urbanity (Bouman, 1987), which, together with the standardised time of mechanical clocks, paved the way for the 24-hour day open for plurality of lifestyles and spatiotemporal strategies. However, the day–night divide is still reproduced or even institutionalised, at least in European cities, through numerous synchronised timings such as opening hours, curfews or typical visiting times.

Dividing the day into 24 uniform hours is just one of many ways to sequence the daily timeframe. In the medieval city, regular daily prayers played an important role as time markers, keeping the urban rhythm, to be later replaced by more secular times and beats linked mainly to the economic production and consumption aspects of city life (Madanipour, 2017). Contemporary Western urban societies possess many pacemakers that generate specific collective timing and the sequencing of the urban day (Paiva et al., 2017). The beginning and end of the work or school day, lunchtime and television primetime are examples of such markers (Mulíček et al., 2016) that may be considered "micro-horizons", anchoring directly the individual routine behaviour and indirectly the collective spatiotemporal structure of the day. Their position within the course of the day is not only measured through the metrics of clock time, but also fixed within successive sequences of everyday practices (Schatzki, 2010).

4 | THE CONCEPTUALISATION AND OPERATIONALISATION OF CHRONOTOPES

To explore temporal prominence we must take into account several contextual variables and concepts. These include the idea of the timeframe, the ways in which time itself is conceptualised, the extent to which time is abstracted from space, and the availability of appropriate temporal data. The analytical sections of this paper will deal primarily with the timeframe of the day, leaving aside the month, season and year. In doing so, we undoubtedly reduce the complex perception of city time, but gain a more accurate and structured methodological grounding. Focusing on the timing and sequencing of different routine activities throughout the (working) day opens more room for building a methodological bridge between classic time geography, rhythmanalysis, and research on urban everydayness. The metrics of analyses and interpretations are grounded mainly in the realm of interaction time, that is, the time that is embedded in synchronised daily routines.

In this paper, we seek to grasp prominent urban times in their spatialised form that are attached to the specific context of their typical locales. In doing so, we employ the chronotopic approach, inspired by Bakhtin (1981) and more recent theoretical studies by Folch-Serra (1990), Bonfiglioli (1997), Crang (2001), and Stabilini et al. (2013). In our analyses, we tend toward the pragmatic understanding of the concept of chronotope presented in studies on time policies in Italian cities (Bonfiglioli, 1997; Mareggi, 2002; Stabilini et al., 2013); we view a chronotope as a distinct place or locale with a characteristic rhythmical profile, a typical temporal regime of place-based social interactions. The analytical frame of the chronotope enables us to spatialise time and temporalise space through rhythms of social activities enclosed within a day-long timeframe and specific physical settings. Here rhythm is a key descriptor of spatiotemporal qualities; for the purposes of the analysis in this text, it is materialised through monitoring the presence or absence of people. The essence of distinct chronotopes thus lies in the everyday dynamism of human co-presence, which indicates the potential for meaningful action in the realms of social space and interaction time.

The question arises of how to suitably map the everyday city and its dynamic phenomena as faithfully as possible and how to capture the rhythms of locations that are not systematically monitored (e.g., by municipal or transportation authorities). The overall rhythm of the everyday city consists of, among other things, space-time sequences taking place on minor streets, in local hair salons, at markets, at transport stops, or other urban places that may be marginal in

spatial terms but still significant in temporal terms. We tried to resolve this issue by utilising pervasive technologies that relatively densely cover urban space and are strongly associated with the various social interactions of urban residents (Calabrese et al., 2014). This disparate group of technologies contains different urban electronic and transaction systems that can provide online occupancy data. Pervasive technologies also embrace everyday gadgets of contemporary society, location-aware technologies (Miller, 2010), including navigation and surveying devices, mobile networks, smaller-scale wireless local area networks, Bluetooth devices and RFID sensors. Services and operations of these devices are secured by awareness of their position in relation to other parts of the network system. Relative positions in the networks are also indirect indicators of exact physical locations. For instance, there are many options produced by smartphones that are continuously searching for the nearby wireless access points (APs). Constant logging of APs (or rather their attributes such as SSID, MAC address and signal strength) and their comparison with the database of known physical location of APs allows the use of spatial and mathematical modelling to estimate the detailed location of devices and their movements in urban space during the day (Ribeiro et al., 2020; Ruiz-Ruiz et al., 2014). As a result, these originally "techno-space" logs (of relative locations of devices in computer network) can offer proxy data of spatiotemporal knowledge of real users/visitors and particular places. Examples of the use of these methods include services of search engines or social networks in providing business information about places.

To operationalise urban rhythms and outline the chronotopes, we used spatiotemporal data on the example of the city of Brno, Czech Republic. The city of Brno has about half a million daily inhabitants. The city is the core and essential hub of daily spatiotemporal relations involving working, housing, consumption, services and leisure, as well as being an important administrative and education centre. The city underwent a post-industrial transformation in the 1990s and is currently undergoing an economic restructuring towards IT and technology services. The basic morphology of the city is defined by a multifunctional inner city surrounded by residential districts, large socialist-era housing estates and a mixed suburban zone. However, this type of research could in fact be carried out in any other model city. We assume that Brno is analogous to other medium-sized cities in Central and Western Europe in terms of spatiotemporal signatures.

We managed to design chronotopic mapping from publicly available data of pervasive technologies. Although mobile phone networks data are currently widely used for analyses of urban rhythms arising from human mobility (Liu et al., 2021; Tartia, 2018) or for identifying different kinds of hotspots within urban environment (Šveda et al., 2020), in our case we have opted for a mix of data sources providing aggregated data on the occupancy of specific locations. As we are fully aware that the comprehensiveness and aptness of such data could be limited in terms of describing all situations, social groups and the complete detailed rhythms of the city (including non-humans, goods, etc.), we call our input data spatiotemporal proxies. Proxies can be good descriptors of the urban spatiotemporal organisation, although they can never be completely exhaustive, and their interpretation cannot be performed by statistical analysis alone (especially in urban rhythmanalysis approach). The data we used in our analysis come from public websites of various systems of parking lots, registers and terminals at sports facilities, occupancy-monitoring solutions of selected stores, or from state and local government offices systems with published queue lengths and the average delays at counters. A large part of the sources is covered by aggregated proxies from Google Popular Times and Facebook Popular Hours features, which provide information about average occupancy of urban everyday places such as restaurants, cafes, city parks, entertainment centres and small stores, but also car repair shops, bus stops, religious places or medical services buildings. This diverse database allows us to cover (almost) the whole spectrum of urban places with expected human co-presence.

As pervasive technologies are not a uniform category, we could not rely on a uniform and standardised data source. Therefore, we conducted a survey of available options and then set up our own web harvest scripts. In this way, we were able to map nearly 2000 urban places in the city of Brno. These locations had not been predefined and were created randomly, based on the availability of our mix of public sources explained above. The input format could be divided into two main categories: Application Programming Interface (API) sources and non-API sources. While API inputs include standardised interchangeable file formats and can be read automatically, non-API sources embrace structured files (normalised, searchable: CSV, XLS, SQL), semi-structured (mainly display formatted: HTML, CSS, scripts), or even unstructured files (electronic documents: plain texts, pictures, videos), which require more complex parsing and editing for storage and database normalisation. In these specific cases, we proceeded manually. From the perspective of space-time research, data sources were not always natively compatible with each other in the type of provided expression (relative vs absolute). In some cases, it was necessary to perform periodic collection (aggregated data vs. simple records) and harmonise the type of collection (historical vs. current data and forecasts). When it was necessary to collect data periodically, we chose an interval of five minutes for at least three weeks to confirm everydayness and ordinariness of rhythms. To create robust spatiotemporal proxies, all data were converted to a relative scale (relative to the maximum occurrence) because exact absolute numbers were not strictly necessary for our analysis. Finally, determining meaningful groups by a

hierarchical clustering method and analysis of variance, we identified distinct rhythmic patterns in the set of our spatiotemporal proxies. The resulting clusters were employed (not exclusively) as an external basis for chronotope construction and qualitatively oriented interpretation—rhythms play a crucial role in defining chronotopes as they provide temporal identities to locales physically anchored in urban space. Although clusters represent a set of localities or places with the same type of quantifiable rhythmic profile, we perceive the inner components, their relations, powers and transitions between them as more important in clarifying the prominence of the places. In other words, quantitative cluster analysis of spatiotemporal proxies served as a chronotopic basis for qualitative interpretation of time centrality and prominence. Each of the chronotopes is not only visualised through the peak hours and the shapes of the rhythm curves, but at the same time, narrated—its elusive spatiotemporality is reflected in the story contextualising the scale, pacemakers, and actors involved.

5 | BRNO'S CHRONOTOPES: PLACED AND SCALED PROMINENT TIMES

Just as centrality in the spatial sense can take different forms, the concept of spatiotemporal centrality, or prominence, contains multiple perspectives, which will be presented below with empirical examples of specific chronotopes. In this section, we introduce several chronotopes that emerged out of data analysis. These chronotopes are just a sample of the building blocks that make up the overall rhythmicity of the city. These examples should be understood as snapshots of recurrent situations in which specific urban locales and specific times are linked together through the peak presence of interacting individuals. As such, they are a kind of analytical construct extracted from a much more complex rhythmicity of everyday life, which represents a starting point for mapping the varied forms of prominence. Capturing prominence means going beyond quantitative measures. It is more of an interpretive process, in which prominence is approached through both location (putting peak occurrence of people in relation to other places) and narration (putting peak occurrence of people in relation to past and future times). The notion of prominence thus refers to the multiple instances of synchronisation among various actors and pacemakers throughout the day.

5.1 | The morning chronotope(s) — the prominence of the day's beginnings

Looking through the dataset it appears that locales such as car repair shops, doctor's practices, dental surgeries and wholesale outlets ("morning services" rhythm in Figure 1) follow the same rhythmic pattern. The fact that the peak hours are in the morning may indicate a specific urban practice unifying the temporality of these seemingly unrelated locales. We mean a plethora of distinct activities and routines exist that are primarily associated with the beginning of the day: rubbish collection, the delivery of pastries to shops or the gathering of parents' cars in front of school buildings are visible and quite familiar examples of situations that take place in the morning, and at the same time, contribute to a meaningful definition of the term "the morning city."

The practices taking place in the aforementioned locales have a common feature if we look at them through the prism of daily rhythmicity. They open a relatively self-contained timeframe of the day as they stand very close to the frontier between night and day. Their prominence arises from the position at the very beginning of more or less complicated chains of daily routines, which inhibited during the nighttime, start again and again with the onset of the daylight hours. Many morning activities and events are not spatially and temporally independent on other practices. On the contrary, they are often the initial step in more complex organisational patterns, a decisive moment from which the logical chain of subsequent activities and practices derives.

The increased morning occupancy of doctor's practices may illustrate the general interpretation presented above. Morning is the optimal time for medical procedures, such as taking blood samples, which is usually done on an empty stomach. Blood and other biological samples are usually taken in the morning so that the results can be available for further testing during the day. Blood collection is the first step in a chain that includes laboratory analysis, evaluation and interpretation of results, and so on. Similarly, morning appointments with doctors are just an entry point in a series of other specialised procedures throughout the day.

A similar interpretation seems to be applicable in explaining other spatial and practical contexts within the morning chronotope. We observed pronounced morning peaks at automotive, construction, electrical and plumbing wholesalers because the purchase of work materials is the usual first task that predetermines the work schedule of many craftsmen and small businesses.

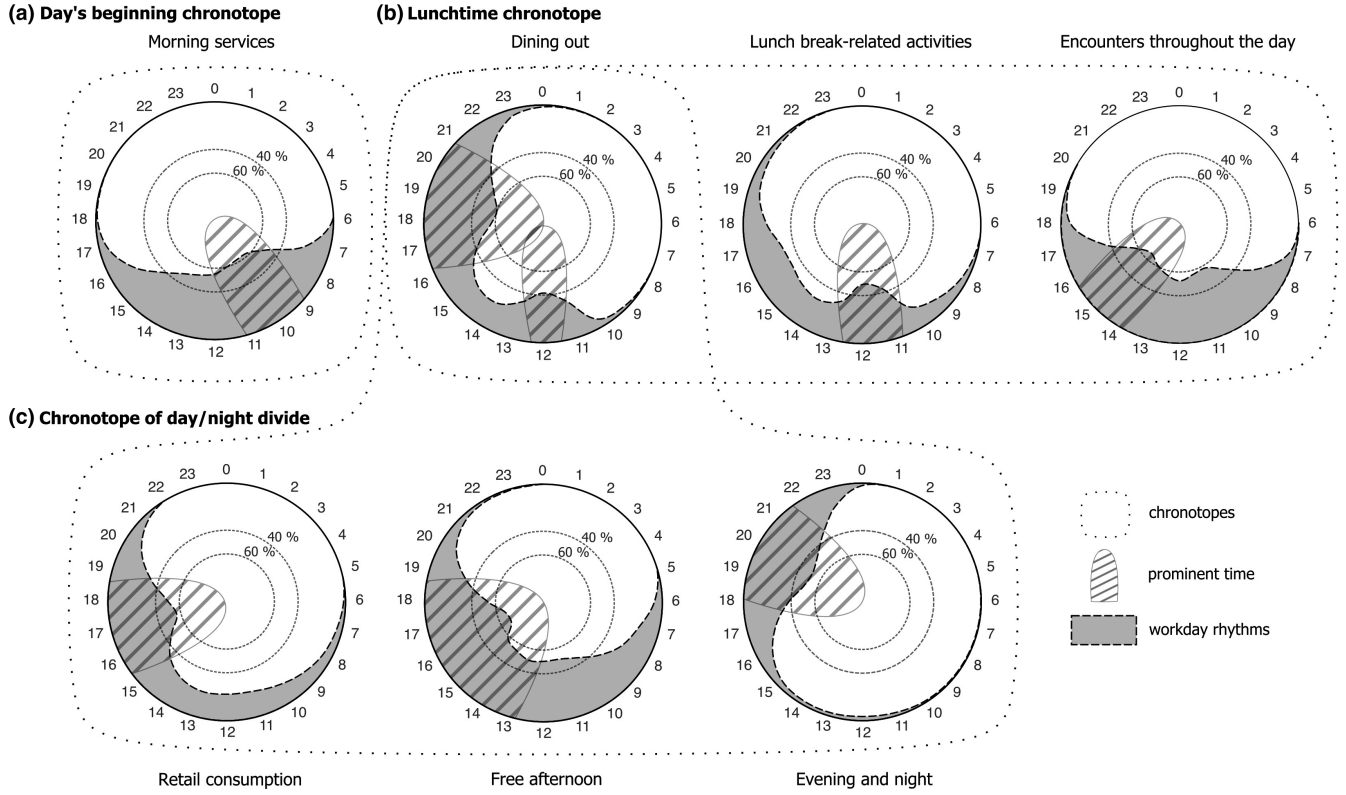

FIGURE 1 Chronotopes derived from spatiotemporal proxies (rhythm of individuals present)
[Correction added on 15 January 2022, after first online publication: Figure 1 image has been corrected in this version.]

In summary, it can be argued, that the prominence anchored in the places and times of the morning chronotope reflects to some extent the routine temporal order of urban practices. Conceptualised in this way, prominence is a quality resulting from an initial position in the unidirectional passage of time bounded by the scale of the day. The elements of morning chronotope represent decision-making moments; that is, central moments for the timing and location of upcoming individual daily rhythms.

5.2 | The multiple centralities of lunchtime chronotope

Lunchtime has long played an important role in the temporal organisation of urban life, whether we are examining the biological or labour rhythms of urban society (Lynch, 1972). Visualising data on occupancy confirms this prominent position, despite the fact that the underlying rhythm patterns may appear quite complex. Around lunchtime, there is a peak use of facilities and services that can be categorised into two broad groups, each providing a somewhat different explanatory perspective. These include, firstly, locales where people eat or procure meals, and secondly, locales that are only indirectly related to the bio-cultural rhythms of food intake.

In Brno, lunch is typically eaten around noon. The period of lunchtime is not a mere segment of chronological time; it should be understood as a constantly contextually negotiated spatiotemporal phenomenon interweaving the physiological rhythms of the body, habits and cultural norms regarding the appropriate timing of meals. The rhythm of restaurants, fast food establishments and meal delivery services ("dining out" rhythm in Figure 1) thus reflects not only the human need to eat and drink, but also the socially accepted "proper" times and places for having lunch. In particular, it is the 30-minute scope of the lunch break resulting from labour law regulations that significantly constructs not only the temporality but also the spatiality of urban lunchtime for many employees on weekdays. This short available time links clusters of jobs with nearby lunch options, introducing temporal and spatial "dining archipelagos" into the city's timespace.

It is not just eating establishments, but also hair salons, grocery shops, florists and fast-moving consumer goods shops ("lunch-break related activities" rhythm in Figure 1) that show peak traffic during lunch hours. In addition, at the times immediately preceding or following the lunch break, there is a clear increase in the number of people in locales such as banks, post offices, pharmacies, and copy centres ("encounters throughout the day" rhythm in Figure 1). This relatively wide range

of locales defining the lunch chronotope highlights a certain multiplicity of meanings of the lunch break. It is not just about lunch *per se*. Lunch break is not just a utilitarian slice of the working day set aside for dining; it is also an opportunity to break away from the routine of regular schedules and to incorporate short-term tasks. It can therefore be seen as a kind of niche for time-limited errands and encounters taking place against the background of longer-term schedules. Some of these errands might be regular or even habitual at the individual level, such as making weekly payments at the post office. Other types of stops, such as a visit to a bank or a hairdresser, represent a break from the steady rhythm of routine places and times. They are rather spatiotemporal singularities on the individual scale of daily routine, types of "micromarkers" that emerge when breaking the usual daily cycle.

Based on an extended interpretation of the data, the prominence embedded in the lunchtime chronotope can be described as multi-layered. It derives from the fact that lunch is not only a biological component of the circadian rhythm, but also an important marker within the realm of socially constructed time. Lunchtime splits up the working day into two parts, drawing the line between "before lunch" and "after lunch" times. Moreover, the prominence resulting from a symbolic disruption of the routine daily cycle is also translated to the corporeal domain. The lunch break allows one to leave physically the regular working locale and therefore opens up a limited spatiotemporal window for individual, often non-routine, exceptional practices.

5.3 | The prominence of times and places on the divide between day and night

Paraphrasing Melbin (1978), the chronotope covering the times and places of urban late afternoon and evening occurs metaphorically in a frontier timespace separating the daytime from nighttime. However, as Shaw (2015) notes, this boundary between day and night is in fact not so clear-cut; the onset of night is a gradual and fragmented process. The transition between the light and dark parts of the urban day also implies a transition between work and non-work activities. There is a plethora of activities that to some extent blur the sharp boundaries of work and rest; they may extend the bright and active part of the urban day to chronologically later times, or on the contrary, they may accelerate the onset of evening and night as times reserved for non-work social interactions.

Based on the data analysis, we identified three to four groups of rhythms that constitute a specific and, in terms of spatiotemporal prominence, reasonably interpretable chronotope. Firstly, we can see a peak presence of people in the cafés and parks, sport grounds, gyms and adjacent kiosks or bistros between 4 and 5 PM ("free afternoon" rhythm in Figure 1). Secondly, the visualisation of the rhythm of retail consumption depicts a continuous increase in the number of people at supermarkets, hypermarkets, malls, and miscellaneous types of convenience stores ("retail consumption" rhythm in Figure 1) from early morning to late afternoon, with a peak around 5 PM. Thirdly, the early evening hours around 7 PM are the peak times for restaurants, fast-food establishments, pubs and bars ("dining out" and "evening and night" rhythms in Figure 1). These rhythms (or at least parts of them) interlink the times and places in which the "rite of passage" (Ashforth et al., 2000) from work or school milieu to home or leisure locales takes place.

The term rite of passage is used here in a metaphorical sense, in an attempt to point to the prominence resulting from a certain hybridity or liminality of activities between day and night. The places and times united under this chronotope are spatial and temporal locales for activities that are carried out on the way home (e.g., shopping, a walk in the park), for activities that are neither strictly work nor strictly home (e.g., visiting a pub, working out at the gym). They represent a liminal timespace, large enough to accommodate a significant part of broadly defined urban consumption, which to some extent symbolises the antithesis of the productivity of the previous parts of the day. Prominence in this case is anchored in the substantial reordering of the urban workday; that is, in a shift towards a less disciplined (in spatial and temporal terms) and largely non-productive sequence of daily urbanity. The spatiotemporal reordering that occurs in the early evening is usually mirrored in the functioning of related urban infrastructures, such as public transport or maintenance and surveillance of public spaces.

6 | CONCLUSIONS: INTERPRETING PROMINENT URBAN TIMES

In the analytical part of the paper, we approached urban everydayness as a spatiotemporal nexus in an effort to view the phenomena of urban centrality from a different perspective. Thinking "spatiotemporally" means not only accepting the chronological dynamism of urban places that stems from the flow of mechanical time; it is more than a temporal

regionalisation dividing an urban day, week or year into clearly delimited periods. It rather calls for a thorough, more nuanced interpretation that takes into account the multiple contexts of the timing, sequencing and coordinating of urban activities. In this sense, chronotopic urban analytics seems to be inherently relational as it enables the linking of a specific type of urban locus with specific temporalities through rhythm. Rhythm is the analytical glue fusing together networks composed of different actors and scales, holding together the different timespaces inextricably linked to the recurrent practices, times and places within these networks. When seeking to identify prominent urban times, we must examine the power of particular networks to configure the urban temporal landscape.

The chronotopes presented in this study are not merely quantitative constructs whose meanings derive from the number of people present in particular types of urban places at particular times. The rhythmic patterns, so appropriate for visualisation in the graph, are however just a starting point for developing the narrative component of chronotopes. Storytelling is integral to qualitative rhythmanalysis; it complements the predominantly visual approaches of spatial/temporal localisation to achieve an understanding of the collective synchronicities and synchoricities tied to various relational networks. Each of the seven clusters of locales identified based on a similar rhythm is embedded in a distinct situation (or situations) generated by the repetitive daily routines of distinct actors. These situations are not singular events, which could be easily spatialised as a point on a timeline. They are micro-stories with different durations, starting and ending times that are inscribed in the collective social time of the city. They provide a semi-predictable milieu in which urban actors engaged in multi-layered networks can coordinate and negotiate their everyday practices. Prominent times are the focal points of these stories; they can take different forms as can the idea of prominence itself.

In our concluding interpretation of narratively grasped chronotopes in Brno, we avoid depicting prominent urban times on the linear timeline of the day. Instead, we will try to comment on the various essences of temporal prominence and at the same time outline some of the interpretive frameworks at play. Firstly, temporal prominence can be interpreted as a quality arising when there is a transition between the two distinct spatiotemporal environments. Hence, we view, for example, morning peak hours as a kind of ecotone, as a buffer zone linking nighttime with the beginning of the active day. The same interpretative logic can be applied to the chronotope of day/night divide whose underlying narrative is that of the transition between the spatiotemporalities of work and home or day and night, respectively. The transitions observed in the grand urban scale of our analysis are the aggregation of rather banal "spatiotemporal ecotones", sequencing individual everyday routines into self-contained blocks.

Secondly, we focused on the symbolic power of certain times and spatiotemporal events. Lunchtime is a prime example of a temporal marker that goes far beyond the domain of the biological rhythms of human metabolism and nutrition. The spatiotemporal story of lunch includes other dimensions. Lunchtime breaks up the monotonous working day into two parts; it is a temporal stamp or milestone indicating activities "prior to lunch" and "after lunch." Although Parkes and Thrift (1979) spoke of markers as extraordinary events that disrupt routine activities, we emphasise the role of markers as recurring events. As such, they do not necessarily have to be fixed in the coordinates of the mechanical time; they themselves represent meaningful times relatively independent of chronological metrics.

Thirdly, prominent times always have an underlying current of kairos (Rämö, 1999); that is, the idea that the right activity is happening at the right time. Stops and errands distributed around noon or lunch break related activities should be viewed as the outcomes of individual efforts to find appropriate timing. They include both planned and spontaneous decisions made to fit less frequent or occasional practices of daily routine into spatiotemporal "windows" that open and close alongside other scheduled daily activities.

The three outlined frameworks are undoubtedly closely intertwined—when interpreting the nature of urban prominent times the logics of transition, markers and kairos are fused in the chronotopic stories presented here. Regardless of the interpretative perspective applied, there is a bond between a specific temporal prominence and the locales in which it can be observed using the tools of rhythmanalysis. These locales and places do not necessarily have to be perceived as central in collective spatial images of the city. Rather, we can talk about the place-making power of the beat of prominent times that constantly shapes and transforms the relatively static spatiality of the city.

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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Imaginace a reprezentace prostoru v každodenní zkušenosti*

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The Imagination and Representation of Space in Everyday Experience

Abstract: This article examines the imagination and representation of space in everyday life from the perspective of social geography. Drawing on cultural theory, the article presents space as a multifaceted entity that is perceived, constructed, and reproduced through everyday praxis. It stresses on the situatedness and contextuality of the perception, construction, and representation of spatial categories and relations. To this end, three dimensions of space are discussed: (i) the representation of space in map form, one possible version of which is the concept of the route, founded on a topological representation of space; (ii) the scalar dimension of space, which involves the scaled representation of everyday space and the various socially, economically, and culturally determined scalar levels on which everyday experience occurs; (iii) the dimension of spatial continuity, which the authors discuss in conjunction with reflections on the ways in which space is represented, and next to the notion of space as an omnidirectional continuous medium they introduce a concept in which space is understood as a series of separate, meaningful entities integrated through mobile technologies to form a time-space network. This theoretical discussion is accompanied by an empirical section that draws on the spatial experiences of five users of power wheelchairs to describe examples of technologically and culturally conditioned imaginations of space.

Keywords: space, everydayness, space representation, map, route, scale, space continuity/discontinuity, wheelchair users
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Úvod

Článek se zabývá formami imaginace a reprezentace prostoru v každodenním životě. Ten zde ovšem na rozdíl od pozitivistických geografických přístupů není představen v univerzální podobě jako rámec pro objektivní lokalizaci a reprezentaci jevů, nýbrž jako mnohovrstevnatá entita vnímaná, produkovaná a reprodukovaná skrze každodenní praktiky. Ty se v sociální geografii stávají stále významnějším objektem výzkumného zájmu v důsledku aplikace kulturálních přístupů, které zdůrazňují situovanost a kulturní podmíněnost lidského vnímání, zvýznamňování a reprezentace prostorových kategorií a vztahů.

Cílem příspěvku je doplnit pozitivistický koncept prostoru[1] o kulturálními přístupy zdůrazňované nesamozřejmé aspekty každodenních prostorových rutin. K tomuto cíli je vedena kritická diskuse neproblematicky pojímaných geografických konceptů a kategorií, jako je místo, prostor, mapa či měřítko, zahrnující opětovné promýšlení jejich významů z konstruktivistických pozic a rozrušení jejich přirozenosti. „Suspendování přirozeného postoje" [Petrusek 1993: 15] či „denaturalizace" konceptů [Harvey 1989: 102] však není dosahováno pomocí Foucaultovy genealogické metody „rozkrývající historii jejich přítomnosti" [Gregory 1994: 369], ale prostřednictvím poukázání na paralelně konstruované alternativy. Prostorová imaginace nemusí být reprezentována pouze mapou, ale i jinými reprezentacemi (trasa, panorama, schéma, scéna atp.), měřítko nemusí být uvažováno v kontextu pouze geografických celků (městská část, město, region), ale i jakýchkoliv jiných a prostor nemusí být nutně chápán jako kontinuální, nýbrž i jako fragmentovaný, perforovaný, síťovaný, převrstvovaný atp.

Naznačenému zaměření článku odpovídá i jeho struktura. Po *Úvodu* následuje sekce *Koncepty prostoru v každodenním životě*, která shrnuje teoretická východiska textu a zároveň zdůvodňuje výběr dimenzí reprezentace, měřítka a kontinuity prostoru k podrobnějšímu rozboru. Sekce *Mapová reprezentace prostoru* diskutuje historicky danou dominanci mapy jako univerzální formy reprezentace prostoru a nabízí diverzifikaci forem prostorových reprezentací, z nichž si pro hlubší diskusi vybírá formu trasového pojetí prostoru. Sekce *Měřítko* se věnuje roli měřítka v reprezentaci každodenní prostorovosti a také faktorům ovlivňujícím vytváření měřítka. Diskuse v sekci *Dis/kontinuita prostoru* dekonstruuje pozitivistickou reprezentaci prostoru jako všesměrně kontinuálního média a přichází s metaforou prostoru fragmentovaného do souboru oddělených entit integrovaných mobilitními technologiemi do časoprostorové sítě. Článek pokračuje empirickou částí, ve které je dokumentována prostorová zkušenost pěti uživatelů elektrických invalidních vozíků. Empirický materiál ukazuje způsoby, jakými jsou

[1] Pozitivistické chápání prostoru je spojeno zejména s konceptem statického autonomního prostoru existujícího nezávisle na objektech a vztazích [Jones 2009]. Tento koncept vychází z teoretických náhledů René Descarta, Isaaca Newtona a Imannuela Kanta [Warf 2009]. Pozitivistický, objektivní, absolutní či karteziánský koncept prostoru jsou v příspěvku chápány jako synonyma.

prostorové imaginace a reprezentace ukotveny v kontextu materiálních, sociálních či technologických možností.

Cílem textu je nabídnout kritickou diskusi vybraných prostorových konceptů a kategorií, neproblematických a univerzálně platných v rámci pozitivistických vědních přístupů, nicméně mnohovrstevnatých a kontextuálních v realitě každodenních prostorových rutin individuálních aktérů. Přenesením empirického těžiště článku do prostředí zdravotně znevýhodněných osob s omezenou mobilitou je zvýrazněna pluralita konstruovaných imaginací a reprezentací prostoru a také posílena relevance tématu prostorového znevýhodnění. Zachycení alternativních forem osvojení městského prostoru postavené na zkušenosti uživatelů elektrického vozíku napomáhá zodpovědět otázku, nakolik se univerzálně přijímaná schémata prostorové imaginace, reprezentace či orientace spolupodílejí na (prostorovém) znevýhodnění osob s omezenou mobilitou.

Koncepty prostoru v každodenním životě

Každodennost (*everydayness*) byla Henri Lefebvrem definována jako: „… soubor funkcí propojujících do jednoho celku systémy, které se mohou zdát odlišné a oddělené…“ [Lefebvre, Levich 1987: 9]. Jedním z aspektů Lefebvrem zmíněné oddělenosti systémů, které po propojení vytvářejí celek každodenní rutiny, je aspekt prostorový [Lefebvre 1991; Gregory 1994]. Prostorové oddělování „systémů“ domova, zaměstnání, rodinných vztahů či spotřeby je příznakem současného každodenního života, který směřuje pozornost sociálních věd k otázkám role prostoru a přemisťování v prostoru při utváření společenských vztahů.[2]

Současný sociálněvědní výzkum opouští tradiční pozitivistické chápání prostoru jako pasivního rámce pro lokalizaci a (matematickou) reprezentaci jevů a procesů. Prostor je namísto toho chápán jako aktivní, konstitutivní kontext sociálních vztahů, jako prostředí ustavující a současně ustavované každodenními, kulturně či technologicky podmíněnými, tělesnými praktikami [Flusty 2005]. Naznačené postpozitivistické přístupy nenahrazují pozitivistické pojetí univerzálního prostoru zachytitelného a kvantifikovatelného v souřadnicových sítích, ale spíše zdůrazňují pluralitu náhledů na prostor, v rámci kterých je tradiční karteziánský statický prostor pouze jedním z možných.

Samotné pozitivistické nazírání geografického prostoru je historicky podmíněné. Jak poukazuje např. Warf [2009], oddělování subjektu od „objektivního“ prostoru je spjato s renesančním a osvícenským racionalismem a lokalizační a mapovací tradice je důsledkem westernizace světa a koloniální expanze. Kulturně a technologicky podmíněné rozšíření západní kartografie pak představuje nástroj reprezentace a legitimizace pozitivisticky definovaných kategorií a struktur prostoru.

[2] Pronikání geografické imaginace do negeografických, tj. a priori neprostorových sociálních věd od 80. let 20. století je označováno jako *Spatial Turn* [Warf, Arias 2009].

Významným definičním znakem postpozitivistických přístupů k prostoru je přenesení pozornosti na jedince.[3] Prostorová znalost je podle přístupů kulturní geografie vždy situovaná, produkovaná a osvojovaná aktéry s odlišnou pozicí v čase, prostoru, sociálním žebříčku či životním cyklu. Situovaná geografická imaginace je východiskem pro to, co de Certeau nazývá prostorovými taktikami [De Certeau 1984]. Časoprostorový rozměr městské každodennosti představuje uplatňování řady individuálních prostorových taktik s cílem propojit části každodennosti v prostoru a čase do provázaného celku. Prostorové taktiky jednotlivce zahrnují rutinní konceptualizaci prostoru, která umožňuje každodenní orientaci, plánování, synchronizaci a synchorizaci[4] aktivit.

Formy situované percepce a reprezentace prostoru jsou v řadě aspektů odlišné od pozitivistických konceptualizací prostoru. Warf [2009] z kulturněgeografických pozic či Egenhofer a Mark [1995] z pozic kartografických poukazují na skutečnost, že v každodenní rutině je individuální obraz prostoru vytvářen na základě neúplných a optikou pozitivistické geografie také nepřesných informací. Prostor je vyhodnocován z pohledu *insidera*, jedince, který v daný okamžik přehlédne jen část scény, jejíž je součástí. Pohled „zevnitř" je v rozporu s tzv. okularcentrickou pozitivistickou tradicí, která je ztělesňována pozorovatelem stojícím vně scény a schopným ji „objektivně" přehlédnout v její úplnosti (*table-top view* či *God's eye view*); podobně tradice západní kartografie vycházejí z topografického „pohledu odnikud" [Cosgrove 2005]. Kartografická vizualizace prostoru tak zůstává nesituovanou, a proto často nekorespondující s kontextualizovanými imaginacemi.

Jak v polovině 50. let 20. století naznačil Irving Hallowell [1955], schopnost jedince vytvářet schematický prostorový obraz okolního prostředí je zásadním faktorem zapojení se do společenských vztahů – současně jsou formy konceptualizace prostoru sociálně podmíněny [Gregory 1994]. Individuální koncept prostoru jako schematizovaná reprezentace prostředí je zaplňován objekty s přikládaným významem a prostor je utvářen vztahy mezi těmito objekty [Lefevbre 1991]. Právě významy objektů a vztahů jsou kategorií, ve které dochází k interakci prostoru a sociálního kontextu a která je převrstvována zkušeností jednotlivce [Sőderstrőm 2005; Harvey 2009; Jones 2009]. Zvláštní pozornosti se přitom dostává tělesnosti

[3] Přístupy humanistické a behaviorální geografie patří k prvním pokusům o diskusi role prostoru v každodenní lidské zkušenosti. Byť nebyl jejich rozchod s pozitivistickou tradicí (zejména v případě behaviorální geografie) úplný, nastolily výzkumný zájem o člověka „v jeho světě" – jinými slovy zájem o vztah mezi pozicí jednotlivce a jeho individuálním prostorovým konceptem [Ekinsmyth, Shurmer-Smith 2002]. Kritika „přirozených" a „samozřejmých" prostorových kategorií spolu se zvyšováním citlivosti vůči specifickým prostorovým zkušenostem marginalizovaných skupin je předmětem zájmu feministické geografie, která spolu s rozrušováním binárních kategorií muž/žena, heterosexuální/homosexuální usiluje o denaturalizaci substanciálně pojímaných kategorií, tedy i místa, prostoru či mapy [Blažek, Rochovská 2006].

[4] Synchronizací rozumíme koordinaci aktivit v čase, synchorizací koordinaci aktivit v prostoru.

– tělo je v prostorovém kontextu nazíráno jako nositel/zprostředkovatel společenských a kulturních významů, konotací a vztahů [Low 2003]. Levinson [2004] na základě lingvistických analýz vykresluje současnou západní každodenní prostorovou imaginaci jako egocentrickou (určovanou pozicí jedince) a relační (prostor je definován vztahem objektu k jiným objektům) [srov. Lefebvre 1991; Gregory 1994; Cobbarubias, Pickles 2009].

Uvedená diskuze konceptů prostoru je pouze stručnou reflexí vybraných teoretických náhledů na formy imaginace a reprezentace prostoru. V dalším kroku budou diskutovány základní dimenze prostorovosti každodenního života (*spatiality of everydayness*). Jde o vymezení rámců, v jejichž analytických hranicích lze studovat různorodost a škálu podmíněností každodenního poznávání, osvojování a reprezentace prostoru.

Pozitivistická geografie na vrcholu svého kvantitativního období[5] identifikovala 3 dílčí rámce vytyčující vědecký zájem o prostor – (1) směr/orientace, (2) vzdálenost a (3) spojení/relativní poloha [Jones 2009]. Každá z dílčích disciplín kvantifikující, nomoteticky zaměřené sociální geografie pak tyto kategorie významově fixovala a reprodukovala [Strohmayer 2005]. Zatímco například v sídelní geografii byl prostor produkován a strukturován systémy sídel propojených proudy dojížďky a migrace, ekonomická geografie pracovala s prostorem definovaným hospodářskou spoluprací, ekonomickou centralitou či periferností. Ontologie jednotlivých disciplín se ovšem rozcházejí s ontologií prostorovosti každodenního života, stejně jako se míjejí jejich způsoby reprezentace.

Kulturní obrat zasáhl v 80. letech řadu pozitivisticky orientovaných prostorových disciplín a zprostředkovaně i tradičně technickou kartografii [Kitchin, Perkins, Dodge 2009; Cosgrove 2005]. V současnosti jsou to právě diskuze nad povahou kartografické reprezentace světa, jež konkretizují kulturněgeografický diskurz. Úvahy nad krizí reprezentace [Pickles 2004] jsou východiskem pro hledání nových ontologií, které dekonstruují prostorové kategorie pozitivistické prostorové vědy a přibližují se konceptům každodenní prostorové zkušenosti.

Smith a Mark [2001], resp. Egenhofer a Mark [1995] upozorňují, že entity každodenní reality jsou propojeny prostorem – řadu z nich prostor propojuje do komplexnějších celků, které jsou rutinně chápány jako svébytné ontologické kategorie. Panelový dům je *domem*, koncentrace panelových domů je *sídlištěm*, kategorií významově i kulturně odlišnou. Jako svébytná časoprostorová kategorie však může být vnímána i *cesta do práce*, kategorie propojující místo bydliště a pracoviště, zastávky MHD a trasy spojů. Definování kategorií prostorových entit je podmíněno jistým arbitrárním uvažováním měřítka, reprezentace a kontinuity prostorových vztahů vyplývajícím z každodenní zkušenosti, kulturního a jazy-

[5] Jako kvantitativní období je v geografii označován paradigmatický přechod od idiografické popisné geografie k nomotetické prostorové vědě v 60. letech 20. století. Cílem geografie v tomto období bylo odkrývání univerzálně platných zákonitostí prostorového uspořádání jevů; z hlediska metodologie byl důraz položen na matematické a statistické techniky výzkumu [Daněk 2008].

kového kontextu. Koncept každodenního prostoru lze tedy metaforicky popsat jako obraz reality, jehož segmenty vykazují specifickou míru podrobnosti (měřítko) a specifický způsob reprezentace prostorových vztahů.

Příspěvek si podrobněji všímá tří dimenzí prostoru, respektive jeho každodenního osvojování. Dimenze reprezentace prostoru odkazuje ke způsobům, jakými jedinec sestavuje jednotlivé entity do (prostorově) smysluplného celku. Západní mapovací tradice a důraz na vizuální osvojení prostoru kladou do popředí dvourozměrný, topografický a euklidovský obraz každodenní reality. V tomto pojetí je každodenní život reprezentován v souřadnicích horizontálních os; hodnoty vertikální osy jsou vnímány selektivně jako zpřesňující atributy konkrétních míst (hrad je vysoko). Tento náhled je v souladu i s konceptem mentální mapy jako dvojrozměrným mentálním obrazem prostředí abstrahujícím vertikální rozměr [Lynch 1960; Downs, Stea 1977; Golledge, Stimson 1997; Kitchin, Blades 2002]. V kontextu česko/slovenské geografie se lze setkat s řadou autorů, kteří mentálních map ve svých výzkumech využili [Hynek, Hynková 1979, 1980; Hynek 1984; Drbohlav 1991, 1993, 1995; Zubrický 1997; Voženílek 1997; Siwek, Kaňok 2001; Siwek, Bogdová 2007; Kynčlová, Hudeček, Bláha 2009; Siwek 2011; Semian 2012; Šerý, Šimáček 2012]. Zmíněné příspěvky ovšem používají mentální mapu převážně jako analytický nástroj, který není podroben hlubší kritické reflexi. Je-li však cílem textu poukázání na skutečnost, že mentální mapy nelze vnímat jako „přirozené" a univerzální prostorové reprezentace, mají tyto příspěvky pouze omezený vztah ke zde vedené diskusi. Prostorová zkušenost osob se specifickou, přesněji řečeno omezenou mobilitou, jako jsou zdravotně znevýhodnění, uživatelé invalidních vozíků, senioři či rodiče s dětskými kočárky, oproti tomu akcentuje i vertikální rozměr prostředí. Výpovědi uživatelů invalidních vozíků například obsahují teze o trojrozměrnosti prostředí, vertikálním bludišti či připodobnění bariér ke slepým cestám.

Dimenze měřítka míří k definiční podstatě rutinně používaných kvalitativních kategorií daleko/blízko, velký/malý, známý/neznámý; jde zdánlivě o banální termíny, ze kterých je však skládán narativní obraz města či časoprostorové schéma umožňující jedinci koordinovat aktivity. Neexistuje jedno měřítko individuálního prostorového obrazu. Jak je uvedeno v textu dále, měřítko je proměnlivou dimenzí, utvářenou a opakovaně potvrzovanou prostorovými a časovými vzorci každodenní rutiny. Měřítko je současně dimenzí s výraznou situovaností a odtud i dimenzí sociálně a technologicky podmiňovanou – rozšířením knihtisku, telegrafním spojením či rozvojem televize a internetu byly vytvořeny nové měřítkové rámce, do kterých jedinec zasazuje vlastní každodennost.

Dimenze kontinuity prostoru souvisí s topografickou konceptualizací prostředí na úkor konceptualizace topologické.[6] Zatímco topografický obraz reality

[6] Rozdíl mezi topografickou a topologickou koncepcí prostoru je zde chápán ve smyslu rozdílu mezi prostorem reprezentovaným jako povrch a prostorem reprezentovaným jako síť [Warf 2009]. Topografická reprezentace je spojována s euklidovským pojetím prostoru

prostor fixuje v daných souřadnicích, topologický obraz umožňuje jeho transformaci bez ztráty klíčové informace. V případě topologie jde například o znalost počtu zastávek, které oddělují místo bydliště a pracoviště (fyzická vzdálenost mezi zastávkami, tj. jejich topografie, je v tomto ohledu méně důležitá); je to informace typu *třetí ulicí zahněte doleva a pak na druhé křižovatce doprava*, která umožňuje pohyb v neznámém městě, či se jedná o znalost sekvencí výrazných bodů, která jedinci umožňuje kontrolovat pozici na trase. Topografie přidává do topologického konceptu zpřesnění, zavádí různé typy metrik, které umožňují studovat entity prostoru odděleně, v definovaných souřadnicích [Smith, Mark 2001]. Vztahy mezi objekty každodenní reality však často nelze topograficky fixovat.

V příspěvku jsou dimenze reprezentace, měřítka i kontinuity prostoru pojímány jako sociálně a technologicky konstruované. Neproblematické pojetí mentální mapy jako kognitivního obrazu prostředí je výrazně posilováno průnikem kartografie do každodenního života, a to prostřednictvím GIS, navigačních systémů a geolokačních aplikací, zprostředkovávajících topografický obraz prostředí. Zvýšená mobilita populace a související propojování vzdálenějších entit do uceleného konceptu (ontologické kategorie) oproti tomu akcentují topologický rozměr reprezentace – prostorově diskontinuální obraz žitého světa umožňující pracovat s asymetrií vzdáleností a časovým rozměrem každodenního života. Alternace mezi topografickou a topologickou konceptualizací prostoru souvisí i s individuálně uplatňovaným geografickým měřítkem. Topologická znalost tak může být chápána i jako jedna z forem abstrakce komplikované reality při zmenšujícím se detailu pohledu.

Naznačené dimenze jsou v kontextu prostorovosti každodenních praktik podrobněji diskutovány ve třech samostatných sekcích. V první z nich je problematizována univerzalita reprezentace prostoru jako mapy. Vedle ní je nabídnuta alternativní konstrukce reprezentující prostor jako trasu.[7] Druhá diskuse je věnována měřítku, jeho roli v reprezentaci prostorovosti každodenního života a také faktorům ovlivňujícím produkci měřítka. Třetí diskuse denaturalizuje pozitivistickou reprezentaci prostoru jako všesměrně kontinuálního, „bezešvého" média. Souběžně nabízí metaforu prostoru jako sociálně a mobilitně produkované časoprostorové sítě, integrující pouze entity významné z hlediska každodenní rutiny a současně potlačující reprezentaci entit v tomto smyslu nevýznamných.

lokalizujícím objekty v něm. Topologická reprezentace v kontextu poststrukturalistických přístupů klade důraz na znázornění vztahů, které leží pod povrchem prostorového uspořádání [Murdoch 2006].

[7] Alternativa zde není chápána ve smyslu vzájemně se vylučujících možností, ale ve smyslu jedné z mnoha možností. Zajisté by mohly být nabídnuty alternativy jiné, jako např. scéna, panorama, schéma atp. Představení pouze jedné alternativy bylo vedeno snahou o hlubší vhled do vybrané reprezentace, volba trasového pojetí pak byla vedena výpověďmi uživatelů invalidních vozíků, jejichž zkušenost je prezentována v empirické části příspěvku.

Mapová reprezentace prostoru

Opakování kritického promýšlení neproblematicky používané kategorie „mapy" a „mapové reprezentace" prostoru otevírají otázky: z čeho vychází jistota, s níž si představujeme prostor jako dvojrozměrný planární obraz, kde se bere „přirozenost" vizuální reprezentace, komu tato reprezentace vyhovuje a komu naopak ne? V prostorových disciplínách se tato představa ustavila s rozšířením konceptu mentální mapy [Gibson 1950, 1979; Piaget, Inhelder 1956; Lynch 1960, 1980; Golledge, Stimson 1997; Kitchin, Blades 2002], která geografické imaginaci dominovala po druhou polovinu 20. století. První příklady, kdy se tato představa začala ukazovat jako nevyhovující, poskytly výzkumy prostorového chování dětí, zrakově či tělesně znevýhodněných. Vedle představy mapy se tak v odborné literatuře začíná postupně etablovat nová prostorová reprezentace především u marginalizovaných skupin obyvatelstva, a to reprezentace trasy.

V období hegemonie mentální mapy byla orientace pomocí tras prvně popsána u dětí, ovšem pouze jako vývojový předstupeň k vytvoření „plnohodnotné" mapy [Hazen, Lockman, Pick 1978; Conning, Byrne, 1984; Gale, Golledge, Pellegrino, Doherty 1990; Torrell 1990]. Následně se trasové pojetí objevuje v souvislosti s orientací osob zrakově znevýhodněných [Golledge 1991; Golledge 1993; Butler 1994] a uživatelů invalidních vozíků [Vujakovic, Matthews 1994; Matthews, Vujakovic 1995]. V případě těchto dvou skupin se však podle soudobých názorů jedná o méně kvalitní, méně flexibilní a neúplnou reprezentaci prostoru.

Docenění se trasové pojetí prostoru dočkalo až ve spojení s kritikou mentální mapy, která v geografii znevýhodnění (*geography of disability*) proběhla v rámci postpozivitistického obratu. Emancipace trasy jako plnohodnotné alternativy, nabízející vůči mentální mapě odlišné možnosti, byla v rámci geografie znevýhodnění umožněna díky prosazení sociálního modelu znevýhodnění na úkor tzv. modelu medicínského [Gleeson 1999; Imrie 1996; Butler, Bowlby 1997; Dear, Gaber, Takahashi, Wilton 1997; Kitchin 1998; Park, Radford, Vickers 1998].

Znevýhodnění odvozené z medicínského modelu bylo pojímáno jako nemoc, funkční abnormalita, neschopnost vykonávat činnost považovanou za normální [Imrie 1996]. Znevýhodnění je v tomto pojetí individualizované a jeho řešení je na straně jedince. Společnost za něj nenese odpovědnost a jejím cílem je pomoci jedinci s návratem do „normálního stavu" [Golledge 1993; Imrie 1996]. Vůči této představě vystupuje řada autorů s tzv. sociálním modelem znevýhodnění [Oliver 1990; Dear, Gaber, Takahashi, Wilton 1997; Kitchin 1998; Park, Radford, Vickers 1998; Gleeson 1999], který se opírá o argumenty feministické kritiky. Stejně jako nelze zaměňovat biologické pohlaví se společenským genderem, nelze ani hendikep (*impairment*) zaměnit se znevýhodněním (*disability*), tedy se sociální situací těch, kteří s tímto hendikepem žijí [Oliver 1990]. Zatímco hendikep je omezení pohyblivosti či funkčnosti těla, znevýhodnění představuje omezení jedince v takových sociálních aktivitách, ve kterých není zohledněno jeho fyzické, smyslové nebo mentální postižení, a prostřednictvím této nedostatečnosti je jedinec vyloučen z hlavního proudu společenských aktivit [Kitchin 1998]. Prosazení

sociálního modelu znevýhodnění umožnilo poukázat na řadu nereflektovaných forem útlaku, mezi něž patří i zmiňovaný imperativ mentální mapy jako obecného principu organizace prostorové informace.

Kritiku mentální mapy odstartoval příspěvek Reginalda Golledge z roku 1993 „Geography and the Disabled: A Survey with Special Reference to Vision Impaired and Blind Populations", v němž shrnuje výsledky studia prostorové zkušenosti osob se zrakovým znevýhodněním. Golledge tvrdí, že takové osoby vědí relativně málo o komplexitě prostředí, v němž žijí. Z úvah o nesnadnosti představy geografického měřítka, sítě, porozumění významu konfigurace či hierarchie pro zrakově znevýhodněné odvozuje, že jejich představa o prostředí je založena spíše na bodech, liniích a jednoduchých tvarech než na sítích, oblastech, hierarchiích a vrstvách. Osoby se zrakovým znevýhodněním tak oproti vidoucím žijí v odlišném prostředí, jež je nekompletní, ochuzené, a tudíž i méně kvalitní [Golledge 1993]. Příspěvek byl kritizován především za medicínské pojetí znevýhodnění, podporu stereotypů, zdůrazňování odlišnosti [Imrie 1996], pojetí normality, přílišný behavioralismus a podporu sociálního útlaku [Gleeson 1999]. Butler [1994] problematizuje samozřejmost, s níž Golledge ze zdánlivé neschopnosti zrakově znevýhodněných vytvořit taktilní reprezentaci mentální mapy vyvozuje absenci prostorové kompetence. Naznačené potíže totiž nemusí být důsledkem oslabených prostorověorientačních kompetencí, nýbrž důsledkem způsobu hodnocení těchto úkolů. Zanedbání určitých prvků v mentální mapě vytvořené osobami se zrakovým znevýhodněním je spíše důsledkem zjednodušení a generalizace. Přestože mentálním mapám vidoucích respondentů dominují vizuálně výrazné prvky prostředí, skutečnost, že mentální mapy osob se zrakovým znevýhodněním je neobsahují, nedokládá jejich prostorové nekompetence. Lze doložit, že v mentálních mapách zrakově znevýhodněných nejsou vizuálně výrazné prvky obsaženy, protože pro ně nejsou podstatné [Park, Radford, Vickers 1998]. Ignorace vizuálních dominant, na kterých do značné míry závisí orientace vidoucích, se může jevit obdobně nepochopitelná jako ignorace schodů lidmi bez pohybových omezení pro uživatele invalidních vozíků. Butler [1994] tak napadá samozřejmost univerzálního používání mentální mapy při výzkumu prostorověorientačních kompetencí jako neopodstatněnou.

Vůči konceptu mentální mapy vystupují od 70. let také humanističtí geografové, kteří jej však kritizují z existencionálního a fenomenologického hlediska. Řada humanistických geografů se zaměřuje na nevědomost či mimovědomost prostorového chování. Jacqueline Desbarats upozorňuje na nevědomé rozdíly mezi tím, co člověk chce, co si skutečně vybírá, a tím, čeho je ve výsledku schopen dosáhnout. Tvrdí, že je rozdíl, jak člověk o věcech přemýšlí a jak s nimi pracuje. Mluví o nich mimo ně a bez nich, ale pracuje mezi nimi a s nimi, což je rozdíl, který mu nedovoluje myslit a mluvit o nich stejně, jako s nimi zacházet. Je rozdíl, pokud je respondent požádán, aby popsal zacházení s věcí či pohyb prostorem, nebo aby předvedl, jak s věcí zachází, či aby se prostorem skutečně pohyboval [Desbarats 1983]. Jean Piaget hovoří o mimovědomé tělesně motorické zkušenosti, podle které si děti až do pěti let věku fixují cestu ze školky domů [Piaget 1973].

Yi-Fu Tuan na něj navazuje, když se snaží rozpracovat koncept tělesné inteligence či tělesné paměti. Nabízí příklady nevědomé orientace prstů na klávesnici počítače nebo zautomatizované řízení automobilu označované jako silniční hypnóza, při které není mysl využívána nebo se zabývá jinými skutečnostmi, než je ovládání vozidla [Tuan 1975]. Tuan tak ve shodě s Butler upozorňuje na neopodstatněnost představy organizace prostorových informací do mentální mapě podobnému obrazu prostředí. Mentální mapu pokládá spíše za sociálně konstruovanou představu vycházející ze zkušenosti s kartografickými díly, získanou kompetenci jisté organizace prostorových informací než za lidskou přirozenost. Butler [1994] dále nabízí koncepci lineárního, tělesnému i verbálnímu projevu blízkého způsobu organizace, který koresponduje s trasovým pojetím prostoru.

Kritická diskuse konceptu mentální mapy jako univerzální představy prostoru umožňuje poukázat na situace, v nichž je tato představa neplatná. V běžné prostorové zkušenosti člověk flexibilně kombinuje jak představu mapy, tak i trasy. Trasové pojetí prostoru se uplatňuje například při verbálním projevu, když někomu popisujeme cestu [Buttimer 1976; Butler 1994], při aktivitách v měřítku jedné místnosti či budovy [Freundschuh 2000] nebo například při důrazu na kontinuitu prostředí při řízení auta či jízdě na invalidním vozíku [Vujakovic, Matthews 1994; Matthews, Vujakovic 1995; Osman 2012].

Trasa není jedinou možnou alternativou k mapové reprezentaci prostoru, uvažovat lze například o schématech [Tuan 1975], průjezdech [Cullen 1971], panoramatech nebo scénách [Lipus 2006; Valenta 2008; Norberg-Schulz 2010]. Účelem diskuse trasové představy prostoru je „denaturalizovat" prostorovou reprezentaci [Harvey 1989] jako substanci, jako svého druhu danou a neměnnou entitu, a naopak ji ukázat jako něco vyjednávaného, ustanovovaného, sociálně produkovaného.

Měřítko

Měřítko je konceptem stojícím po delší dobu mimo hlavní proud teoretických diskusí v sociálních vědách. Oživení zájmu o měřítko sociálních procesů přinesly globalizační studie v 90. letech 20. století. Situace, kdy konkrétní společenské, ekonomické a kulturní vztahy začaly překračovat své tradiční prostorové rámce, byly popsány řadou konceptů mapujících převážně vztah lokální a globální měřítkové úrovně [Brenner 2001; Herod 2011]. Se zájmem o měřítka „velkých" politicko-ekonomických procesů kontrastuje slabší teoretické zakotvení měřítek každodenního života. Marston a Smith [2001] upozorňují, že každodenní praktiky sice fungují v nastaveném politicko-ekonomickém rámci, jejich měřítko je však produktem či reprezentací procesů společenské reprodukce[8] a spotřeby. Měřítka

[8] Společenská reprodukce je chápána jako „… soubor každodenních znalostí a praktik, které, ač vázány na systém kapitalistické produkce, odrážejí celou svou vahou specifika zúčastněných časů, míst a osob" [Marston 2004: 176].

každodenního městského života jsou vytvářena prostorovostí a rytmy jednotlivců či domácností, kteří poměřují městský prostor specifickými a individualizovanými metrikami [Marston 2004].

O čem hovoříme, když diskutujeme měřítko každodennosti, respektive situovaný koncept měřítka? Tradiční definice nahlíží měřítko jako „taken-for-granted" koncept, ontologický nástroj umožňující reprezentovat jev v dané kategorii detailu a prostorového rámce [Howitt 1998]. V kontextu článku je takto chápané měřítko mírou podrobnosti individuální imaginace či znalosti města. Současně je měřítko obvyklým vyjádřením rozsahu, prostorového a časového rozpětí jednotlivých každodenních aktivit. Jsou ovšem jednotlivé měřítkové kategorie detailu a rámce kategoriemi univerzálně platnými? Mají pojmy *lokální měřítko*, *měřítko čtvrti* nebo *celoměstské měřítko* stejný význam v různých kontextech? V rámci konstruktivistického diskursu je význam ontologických kategorií měřítka zpochybňován. Jednotlivé kategorie měřítka jsou spíše individuálním konstruktem, konstituovaným a převrstvovaným každodenní společenskou rutinou [Brenner 2001]. Lokální měřítka dítěte, pracujícího muže či seniora jsou konstruována na základě různě detailní míry znalosti různě rozsáhlých prostorů. Sociální produkce měřítka je konceptem nabízejícím pluralitu měřítek vyplývající z plurality aktivit v prostoru. Různorodost aktivit jedince produkuje různorodost měřítek, která jsou v průběhu denní rutiny konstruována a uvažována. Pohyb po vlastním bytě produkuje a vyžaduje jiný koncept měřítka než nákup ve velkém obchodním centru, uvažování měřítka při cestě automobilem do zaměstnání je odlišné od uvažování měřítka při vycházce se psem. Každá z aktivit reprezentuje jiný rozsah v prostoru a čase a vyžaduje jinou znalost prostorového detailu.

Freundschuh a Egenhofer [1997] charakterizují čtyři typy prostorů reprezentujících měřítkově odlišné způsoby konstrukce prostoru jednotlivcem (tab. 1). Nejedná se však o hierarchicky odstupňovaný soubor měřítkových úrovní; autoři nabízejí spíše typy každodenních prostorových situací, ve kterých rozsah scény a nutná míra detailu určují způsob jejich konceptualizace a formu jejich kognitivního zpracování. Zejména u prostorových situací velkého měřítka hraje při vytvoření konceptu klíčovou roli pohyb jedince, umožňující prozkoumání a osvojení prostoru. Jiným způsobem osvojení prostoru je pak „panoráma" či „table-top view" [De Certeau 1984; Freundschuh, Egenhofer 1997], při kterém je jedinec schopen přehlédnout scénu bez nutnosti vlastního pohybu – tímto způsobem lze kognitivně zpracovat desku pracovního stolu či otevřenou krajinu z pozorovatelny. Specifickou formou osvojení prostoru je osvojení prostřednictvím mapy či jiné symbolické abstrakce reálného prostoru. Jak Freundschuh a Egenhofer [1997] upozorňují, je význam zprostředkované (mapové) reality stále významnější pro konceptualizaci prostoru města ve větším měřítku. Takřka ubikvitní mapová informace zprostředkovávaná mj. prostřednictvím mobilní výpočetní techniky, zdá se, může výrazně formovat koncept města v měřítku geografického prostoru [Galloway 2004].

Cox a Mair [1988] se snaží problematiku měřítek každodennosti strukturovat jiným způsobem. Premisou pro ně je situovanost každodenního života – každo-

Tabulka 1. Typy prostorů

typ prostoru / prostorová situace	charakteristika a způsob osvojení	příklad měřítka objektů
prostor manipulovatelných objektů	obsahuje objekty zpravidla menší než lidské tělo; pro jejich poznání není nutný vlastní pohyb jednotlivce prostorem	tělo, osobní prostor, deska pracovního stolu
prostor nemanipulovatelných objektů	malý prostor, pro jehož úplné poznání (osvojení) je již nutná částečná lokomoce (pohyb) jednotlivce	obytná místnost, pracovna, byt
environmentální prostor	obsahuje velké nemanipulovatelné objekty, osvojení si prostoru je možné výhradně prostřednictvím prostorové mobility jednotlivce	nákupní centrum, městská čtvrť
geografický prostor	obsahuje velké nemanipulovatelné objekty, možnost osvojení si prostoru pouze fyzickým pohybem je omezená	město, region, stát

Zdroj: Freundschuh, Egenhofer [1997], upraveno.

denní rutina vzniká fixací činností do opakovaných typických časů a míst. Rutinní časové a místní zakotvení aktivit je předpokladem pro předvídatelnost žitého světa. Změna rutinních činností je obtížná, neboť tuto předvídatelnost porušuje. Cox [1998] téma situovanosti rozvíjí zavedením pojmů prostor závislosti (*space of dependence*) a prostor zapojení (*space of engagement*). Dva typy prostorů reprezentují dvě skupiny společenských vztahů s odlišnou prostorovostí a odlišnou rolí v sociální konstrukci měřítka. Prostor závislosti je definován relativně pevně situovanými společenskými vztahy, které jsou klíčové pro přežití, materiální zabezpečení a identitu jedince. Místa, kde spíme, pracujeme, vzděláváme se, nakupujeme či odpočíváme, jsou typickými prvky prostoru závislosti. Společenské vazby spojující jedince a tato místa definují časoprostorový horizont každodenních událostí, definují žitý každodenní svět a definují také jeho měřítko. Prostor závislosti je vložen do širší sítě vztahů vytvářejících prostor zapojení. Pokud pracujeme v místní pobočce nadnárodní firmy, je její lokalizace, zaměření činnosti a počet pracovníků předmětem strategického rozhodování situovaného mimo náš individuální prostor závislosti; prostřednictvím nákupu v hypermarketu se dočasně stáváme součástí globálních dodavatelsko-odběratelských sítí. Nadmístní politiky a strategie tak nepřímo formují individuální každodennost, nicméně není jasné, zda a jakou formou se stávají součástí každodenní rutiny. Níže uvedené teze naznačují, že k reflexi „prostoru zapojení" v individuálním konceptu každodenního světa nedojde, pokud neexistuje intenzivní a opakovaná tělesná zkušenost.

Diskuse měřítka přivádí do popředí otázky tělesnosti a mobility. Každodenní osvojování si městského prostoru je ve značné míře tělesnou záležitostí

[Simonsen 2007; Cresswell 2010] a imaginace prostoru tělesnou zkušenost nutně odráží. Měřítko těla a parametry tělesné schránky regulují prostorový a časový rozsah velké řady rutinních aktivit. Použijeme-li ještě jednou termín prostor závislosti jako koncepční zkratku, je zjevné, že situování společenských vazeb v tomto prostoru se děje převážně prostřednictvím fyzické přítomnosti na jednotlivých místech. Je to pohyb mezi obvyklými místy v obvyklých časech, co vytváří rutinní časoprostor a stává se současně zdrojem i indikátorem měřítka. Praktikovaná mobilita dle Cresswella [2010] propojuje vnitřní svět vůle a zvyků s vnějším světem očekávání a potřeb; je to nakonec vždy měřítko těla, ve kterém je mobilita reprodukována a transformována. Často citovaná De Certeauova kapitola *Walking in the City* [De Certeau 1984] přímo odkazuje k významu pěší chůze pro narativní podchycení městského prostoru; v podobném smyslu se Weber ptá, zda je možné, aby souvislý (topologický) vzorec žitého prostoru jedince vznikl bez mobility [Weber citován in Buttimer 1976: 284].

Spojitost/diskontinuita městského prostoru

V třetí diskusi jde o rozrušení samozřejmosti kontinuity prostoru, a to prostřednictvím poukazu na diskontinuální prostorovou zkušenost městské každodennosti. V pozitivistické geografii přetrvává silná tradice vnímat prostor jako všesměrně kontinuální médium, které se vyznačuje postupnými změnami specifických znaků. Zkušenost každodenního života nabízí odlišnou optiku, skrze niž se žitý prostor skládá spíše z oddělených zvýznamňovaných míst, jež jsou integrována do časoprostorové sítě.

Fragmentace žitého prostoru města do sítě z hlediska každodenního života odlišně vnímaných a důležitých míst je jev, který se vytváří v souvislosti s růstem jeho velikosti, se změnami rozsahu a měřítek každodenních rutin v jeho využívání a s expanzí podpůrných mobilitních technologií. Roli mobilitních technologií je ovšem nutné opravdu spatřovat v oné podpůrné rovině – v tomto smyslu je nutné odmítnout technologický determinismus [Coe, Kelly, Yeung 2007] a zdůraznit, že rozvinutí mobilitního potenciálu vedoucí až ke zmíněné fragmentaci se děje prostřednictvím aktivity sociálních aktérů a díky jejich měnícím se zvyklostem a vzorcům každodenních prostorových rutin.

Dnešní města se liší od středověkých kompaktních měst definovaných docházkovou vzdáleností, v nichž naprostá většina nenáhodných interakcí mezi lidmi byla uzavřena uvnitř hradeb [Hoyle, Smith 1998]. Takové uspořádání bylo tehdy výhodné a de facto jediné možné, protože umožňovalo překonání časové překážky minimalizací vzdálenosti [Bertolini 1999]. Dnešní města jsou však podstatně populačně větší a každodenní život se v nich mnohem častěji odehrává prostřednictvím propojování většího počtu vzájemně od sebe vzdálenějších lokalit. Aby takové propojování bylo možné, je nutné překonat bariéru prostoru mezi nimi prostřednictvím minimalizace času [Bertolini 1999]. K tomu lze v sou-

časných městech využít řadu dostupných technologií: hromadnou či individuální dopravu, případně nespočet zařízení sloužících k téměř instantnímu přenosu informací (telefon, internet, e-mail apod.).

Společným důsledkem existence a využívání zmíněných technologií v každodenním životě je vznik diskontinuit v městském prostoru. Ty lze chápat jako schopnost jedince v časoprostoru města rutinně propojovat řadu vzdálených míst – místo bydliště, pracoviště, školy dětí, nákupů, zábavy apod. – do jednoho systému, který vytváří vzájemně prostorově a časově provázanou individuální síť míst. Mulíček, Osman a Seidenglanz [2011] v této souvislosti hovoří o formování chronopolis jakožto souboru míst se vzájemně se podmiňujícími časovostmi v každodenním životě jednotlivců. Při interpretaci pojmu diskontinuita je důležité i to, že faktory, které vyvolávají potřebu rutinní cesty mezi zahrnutými místy v určitém čase, jsou primárně vázány k propojovaným místům a plánovaným činnostem v nich, a nikoliv k místům, která se nacházejí v prostoru mezi nimi. Tato subjektivně „významupustá výplň" mezi důležitými místy pak plní roli jakéhosi tranzitního prostoru.

Existence tranzitních prostorů v městském prostředí je v souladu s názorem Grahama a Marvina [2001] na výskyt tunelových efektů. Podle nich jsou ty části města, které jsou cílem každodenních cest největšího počtu osob, propojeny nejpokročilejšími dopravními sítěmi. Ty umožňují jejich intenzivní interakce a ve svém důsledku zakřivují časoprostor mezi nimi. Tunelový charakter spojení takových míst je často posilován i skutečnou separací dopravních komunikací od okolního prostředí, neboť v zájmu o co nejvyšší efektivitu byly silnice, železnice či metro ve městech zahloubeny do tunelů, případně vyzdviženy nad úroveň povrchu.

Fyzická separace silniční anebo kolejové trasy od prostoru, jímž prochází, je symbolickým vyjádřením tranzitní funkce dopravy, protože z ní plyne její izolace od reality tranzitních prostorů. Pro trasu spojující důležitá místa ve městě není důležité, kudy vede, ale odkud kam vede a jak efektivně se po ní lze mezi těmito body přepravit. Důležitá místa ve městě tak lze vnímat jako samostatné „ostrovy", pro které je důležité jejich dobré napojení na páteřní dopravní a komunikační infrastruktury [Graham, Marvin 2001]. Symbolickými ikonami takového pojetí dopravy jsou silniční směrovky, které ukazují pouze, kam daný směr vede, ale už neukazují kudy [srov. Amin, Thrift 2002; Cresswell 2006].

Systém směrového a orientačního silničního značení proto může být interpretován jako doklad existence diskontinuit městského prostoru, neboť primárně odkazuje k cílovým lokalitám největšího počtu obyvatel, k nimž vyznačuje nejefektivnější cestu. Zároveň jde o systém zpochybňující hegemonii mapy jakožto ideální a reprezentativní abstrakce prostoru vhodné k orientaci v městském prostředí, neboť využití směrovek spíše odkazuje k reprezentaci prostoru v trasovém pojetí. Ta je zde navíc rutinní součástí každodenního života obyvatelů měst.

Tranzitní potenciál dopravy zároveň odkazuje na koncepty *timeless time* a *placeless place*, které jsou diskutovány v pracích vznikajících v paradigmatu tzv. mobilitního obratu [Adey, Budd, Hubbard 2007; Keeling 2007, 2008]. Jejich podstatou

je teoretický popis způsobů, jejichž prostřednictvím doprava umožňuje přechod člověka z jednoho časoprostoru do jiného, přičemž v průběhu samotného přesunu je člověk vytržen z časoprostoru, v němž se přesun fyzicky materializuje. Tento proces lze v městském prostředí názorně demonstrovat na příkladu cesty metrem, při níž se pohyb vlaku z pohledu cestujících odehrává vlastně mimo město, pod povrchem země a při cestě tedy nelze vizuálně pozorovat změny charakteru města nastávající při přejezdu mezi jednotlivými čtvrtěmi. Před vstupem do systému metra cestující prochází turnikety, pohybuje se na eskalátorech a díky těmto procedurám dochází k jeho transformaci z místního časoprostoru a s ním spojených rutin do časoprostoru transportního. Po příjezdu do cílové stanice stejné procedury pasažéra opět navrátí do časoprostoru místního.

K vytržení člověka z tranzitního časoprostoru dochází ovšem i v případě cesty autem. Příčinou může být jednak již diskutovaná fyzická separace silniční trasy, ale zároveň také charakter samotné individuální automobilové dopravy. Automobil totiž podle Urryho [2004] prohlubuje izolaci lidí od tranzitního prostředí tím, že mění sociální roli ulic. Ty se z míst života mění v místo, kudy protékají anonymizované proudy strojů bez tváří [podobně i Graham, Marvin 2001]. Automobil tak v moderní městské krajině znamená vítězství nad okolním prostředím i nad tím, že jeho posádka je od něho do jisté míry izolována, a to jak fyzicky kapotou auta, tak i vizuálně, neboť výhled přes čelní sklo auta je omezen bočními sloupky a šíře výhledu se zužuje i s rostoucí rychlostí jízdy vozidla. Okolní prostředí je tak z auta méně vidět, slyšet, cítit a nelze se ho dotýkat. Urry v této spojitosti doslova říká, že „auto je místnost, v níž jsou ochuzeny smysly" [Urry 2004: 31].

Diskusi tranzitního charakteru dopravy doplňuje i koncept kognitivního nevědomí. Amin a Thrift [2002] ho vysvětlují jako stav, v němž se odehrává většina činností lidského těla. Princip spočívá v tom, že 95 % pohybů těla je automatických a jejich jednotlivé sekvence nemusí být vědomě racionalizovány. Ve vztahu k tématu sekce je důležité, že podobně se lidé chovají i v každodenním životě – při pravidelné cestě do práce není nutné si racionalizovat každou její součást, neboť cesta jako celek je rutinní záležitostí. Není potřeba přemýšlet nad tím, kde se přestupuje z autobusu na tramvaj, na které křižovatce se zahýbá doprava, kde je při cestě autem lepší se dopředu řadit do pravého jízdního pruhu, protože levý se na další křižovatce mění v pruh odbočovací apod. Koncept kognitivního nevědomí představuje pro prezentované úvahy o diskontinuitním charakteru městského prostředí podpůrný argument – uvolněnou kapacitu mysli je při cestě mezi lokalitami zapojenými do individuální sítě relevantních míst možné využít k jiným účelům, a tudíž ji zřetelněji odpoutat od reality tranzitního prostoru. K takovým činnostem může patřit jak odpočinek, tak i příprava na činnosti plánované v cíli cesty [Jain, Lyons 2008].

Diskontinuitní povaha prostoru každodenní rutinní aktivity situuje do prostředí sítě, v níž se oddělená, subjektivně důležitá místa vzájemně propojují prostřednictvím tranzitních „tunelů". Takové pojetí zároveň nutně předpokládá spíše kombinaci topologického a topografického vyjádření prostředí – zatímco

výchozí a cílový bod cesty jsou jedincem posuzovány v topografickém detailu, tranzitní prostor je pojímán spíše jako topologická generalizace fyzické reality odhlížející od drobností, jako jsou např. přesné uspořádání přestupního terminálu hromadné dopravy či konfigurace jízdních pruhů v křižovatce. Detaily tohoto druhu jsou sice jedinci dobře známy, ale jejich zvládání se odehrává v módu kognitivního nevědomí. Rutinní pohyb mezi výchozími a cílovými místy odehrávající se v tranzitních „tunelech" také podporuje možnost využít k reprezentaci městského prostoru kromě mapové formy také formu trasy.

Minoritní prostorová imaginace: „já nemám orientační smysl"

V následující části příspěvku bude představeno, jakým způsobem se trasové pojetí prostoru, kontextuální volba měřítka prostoru a diskontinuita prostoru ukazují ve zkušenosti pěti uživatelů elektrických invalidních vozíků. Vycházíme z dlouhodobého výzkumu prostorového chování uživatelů elektrických invalidních vozíků, který začal v létě roku 2010 a stále probíhá. Výzkum se týká osob s diagnostikovanou myopatií využívajících pro realizaci svých každodenních aktivit elektrický invalidní vozík. Komunikační partneři navíc sdílí i společnou zkušenost alespoň částečné závislosti na ústavní péči a přechodu na elektrický vozík ve věku mezi 16. a 18. rokem života. Komunikační partneři byli vybíráni pomocí metody sněhové koule a vzájemně se mezi sebou znají.

Přestože příspěvek vychází výhradně ze semistrukturovaných rozhovorů, může se opřít i o širší paletu metod, využívaných v celém výzkumu. Vedle rozhovorů se jedná o kresbu mentálních map či tras, zákres do podkladových plánů, sledování pohybu pomocí segmentovaného určování polohy technologií GPS, zúčastněné pozorování a průchod tras s komunikačními partnery. Jejich výsledky jsou vzájemně triangulovány, čímž je zvyšována jejich validita.

Semistrukturované rozhovory jsou uskutečňovány opakovaně s pěti komunikačními partnery (4 muži, 1 žena) ve věku 34–36 let dlouhodobě žijícími v Brně. Rozhovory probíhaly buď v bytě komunikačního partnera, nebo v restauračním zařízení. Počet komunikačních partnerů se v průběhu času ustálil na pěti. V tomto rozsahu bylo opakovaně dosahováno teoretické saturace a další rozhovory přinášely minimum nových informací. Cílem výzkumu je analýza způsobu, jak se ve výpovědích ukazuje prostorové znevýhodnění a jak lze toto znevýhodnění analyticky uchopit pomocí třech výše uvedených diskusí o neopodstatněnosti univerzálního uplatňování mapové reprezentace prostoru, určité úrovně měřítka a kontinuity prostoru. Jedno kolo semistrukturovaných rozhovorů se zaměřilo přímo na prostorovou zkušenost komunikačních partnerů. Pro rozhovor byla připravena témata prostorové orientace, vnímání prostoru, hledání cest, používaného měřítka a diskontinuity prostoru. Otázky připravené pro případné použití měly například takovouto podobu: Jak postupuješ, když máš sraz nebo musíš něco zařídit někde, kde to neznáš? Podle jakých kritérií volíš způsoby dopravy? Čemu při pohybu věnuješ nejvíce pozornosti? Co je podle tebe orientační smysl?

Samotný rozhovor byl tazatelem strukturován pouze částečně. Komunikační partner sám určoval směr plynutí rozhovoru a vybíral konkrétní příklady, situace a subtémata, úlohou tazatele bylo pouze doptávat se na detaily, nejasnosti, držet komunikačního partnera u tématu výzkumu a interpretovat jeho výpovědi. Každý rozhovor trval od dvou do čtyř hodin a dohromady tak bylo doposud získáno více než 25 hodin záznamu.

Empirický materiál představuje způsoby, jak se ve výpovědích pěti uživatelů elektrických invalidních vozíků ukazuje zkušenost obtížně interpretovatelná pomocí univerzálně uplatňovaných kategorií prostorové představivosti, jako je mapa, měřítko a kontinuita prostoru. Komunikační partneři vypovídají o zkušenosti s nespojitým, lineárně organizovaným a detailně představovaným prostorem. Tato reprezentace je však samotnými komunikačními partnery interpretována jako nedostatečná či nekvalitní a jejich prostorová orientace pak jako špatná, či dokonce neexistující, což plně koresponduje s jazykem medicínského pojetí znevýhodnění využívaným v odborné geografické produkci.

Příběhy našich komunikačních partnerů odrážejí životní zkušenost spojenou s přechodem na elektrický vozík až s dovršením plnoletosti. Jedná se o skupinu lidí narozených s tělesným hendikepem (svalová dystrofie) v první půli sedmdesátých let. Jejich hendikep neumožňoval zařazení do společnosti minulého režimu, a dokonce ani samostatný pohyb na mechanickém vozíku v rámci zdravotního zařízení, kam byli téměř bez výjimky umisťováni. Komunikační partneři vzpomínají nejen na tamní nedostatek mechanických vozíků („měli jsme třeba jeden na patro“), ale i na jeho nevyužitelnost („na mechanickým jsem se nemohl samostatně pohybovat, takže jsem s sebou vždycky někoho měl“). Rok 1989 je zastihl ve věku dovršené plnoletosti a znenadání jim byl k dispozici elektrický vozík, který jim umožnil samostatný pohyb prostorem. Přestup z postele na elektrický vozík v podstatě v jediném dni tak pro ně podle jejich vlastních slov představoval jednu z největších životních změn. Zkušenostmi, kterými si dítě/dospívající člověk prochází postupně – posadit se, stát, chodit, orientovat se, hledat cestu, umět se vrátit, poznávat okolí bydliště, jezdit na kole a řídit auto – se v jejich případě odehrály najednou.

Jejich prostorová zkušenost je zároveň výrazně svázána s využívanou technologií – elektrickým invalidním vozíkem. Elektrický vozík využívaný komunikačními partnery váží v průměru okolo sta kilogramů. Bez ohledu na pohyblivost jeho uživatele není sám o sobě schopen překonat sebemenší výškový rozdíl povrchů. Vyžaduje naopak striktní průjezdnost, bezbariérovost. Maximální rychlost se liší dle konkrétního typu. Většina se však pohybuje okolo 10 km/h a na hladkém povrchu, široké cestě a z kopce je možné dosáhnout i 12 km/h. Jde tedy o dvakrát až třikrát rychlejší pohyb oproti chodcům. Pohyb na elektrickém vozíku navíc nevyžaduje fyzickou námahu, a tak je do určité míry obtížně identifikovatelný například i sklon terénu. Pravděpodobně největším limitem elektrického vozíku je výdrž jeho baterie. V několika případech uživatelů staršího modelu vozíku byla artikulována snížená kapacita baterie a z ní vyplývající omezení pohybu

prostorem. Komunikační partneři začali více využívat MHD, přestali podnikat průzkumné cesty, více mysleli na dobu nutnou k návratu domů atp. Technické možnosti elektrického vozíku se tak přímo promítají do prostorové zkušenosti jejich uživatelů. Z důvodu tohoto úzkého vztahu vozíku a jeho uživatele se v odborné literatuře pro jejich označení začal užívat pojem kyborg [Haraway 1990; Swyngedouw 1996; Gandy 2005; Shields 2006].[9]

Prostorová zkušenost komunikačních partnerů je tak vedle hendikepu a jeho sociálně ustaveného významu výrazně ovlivněna i technologicky. Jak se ukazuje ve výpovědích komunikačních partnerů, hybridizace prostorové zkušenosti [Whatmore 2002] se vymyká dominantní prostorové imaginaci a lze ji pouze obtížně popsat pomocí univerzálních prostorových kategorií (místa, prostoru, mapy, měřítka atp.) Společnou stránkou všech rozhovorů bylo velmi kritické sebehodnocení ve vztahu k prostorové orientaci. V nějaké podobě se v každém z rozhovorů objevilo vyjádření nekompetentnosti: „já nemám vůbec žádný orientační smysl", „já jsem se s mapou nikdy nenaučil pracovat", popřípadě „já jsem to nakreslil úplně blbě". (Údaje v závorce za citací odpovídají genderu, věku a datu rozhovoru.)

> (Já) jsem hroznej degen v tom, že prostě nemám orientační smysl. Absolutně nevím, když mi řekneš, že jdeš někam po Masaryčce, tak vůbec nevím, kde to je ani pomalu. Já sice vím, kde to už teďka je, ale když řekneš, že zahneš tam někam, tak já vůbec nevím kam. Protože mám hrozně špatnej orientační smysl, ale fakt strašně. (M, 34, 16. 1. 2011)

Ve výše zmíněné výpovědi lze rozeznat internalizaci odpovědnosti za neschopnost samostatné orientace v prostoru. Je přece samozřejmostí orientovat se v prostoru a individuální odpovědností každého této samozřejmosti dostát. Ve výpovědi je tak uplatněno „medicínské pojetí" znevýhodnění [Oliver 1990; Gleeson 1999], v jehož rámci se společnost na znevýhodnění žádným způsobem nepodílí a nenese za něj odpovědnost. V souladu s Judith Butler, která o utlačujícím diskurzu začíná hovořit tehdy, když tento diskurz od hovořícího subjektu požaduje, aby sám participoval na podmínkách tohoto utlačování – tedy aby subjekt sám svoji vlastní nepoznatelnost, nesrozumitelnost považoval za samozřejmou [Butler 2003: 161] –, lze na tuto výpověď nahlížet i jako na projev společenského útlaku. V následujícím textu bude podrobněji rozebráno, jak se tento pocit „nedostatečnosti" objevuje v kontextech spojených s mapou, měřítkem a kontinuitou prostoru.

[9] Pojem kyborg je spojován s potřebou pojmenovávat hybridní podstaty fenoménů. V tomto případě se jedná o potřebu spojit v jednom termínu „kybernetiku" a „organismus", aby bylo umožněno vyjádřit vzájemné propojení člověka a technologie. Do odborné literatury se termín dostal v rámci kritiky karteziánského oddělení těla a mysli [Haraway 1991]. Tento myšlenkový posun mimo jiné umožňuje zdůraznit, že lidské vědomí technologie nejen utváří, ale zároveň je těmito technologiemi zpětně ovlivňováno [Crang 2009].

Pojetí mapy jako dominantní prostorové reprezentace je jedním z rozměrů prostorového znevýhodnění, které se ve výpovědích objevilo, a prvním, kterému se zde budeme věnovat. Komunikační partneři odmítali kresbu mentální mapy, nerozuměli zadání, rozhovory provázely otázky po účelu takového úkolu, konstatování, že neumí kreslit, že by raději svůj prostor popisovali slovně atp. Obdobná situace se opakovala, když byli v dalším kole rozhovorů požádáni o zakreslení svého prostoru aktivit[10] do plánu města Brna. Níže uvedená citace ukazuje způsob popisu cesty při rozhovoru nad plánem města.

> Takže tudy sjedeme dolů. Ale jak se tam dostaneme? Zastávka Malá Klajdovka. Malá Klajdovka by měla být někde tady. Nevím, tady se, tady se… Objedeme Líšeň, já to úplně vidím, jo. Ale měli bychom se dostat opravdu na tu… A potom to tady nějak projedeme prostě a dostaneme se na Starou Osadu. (Ž, 35, 24. 5. 2012)

Komunikační partnerka zde uvádí, že to „úplně vidí", ale její imaginace naprosto neodpovídá mapě, která jí při této představě dokonce překážela. Stále inklinovala k verbálnímu popisu velmi detailně vykreslených konkrétních míst, která ale nebyla mezi sebou graficky propojena v jeden prostorový celek. Jednotlivá místa však byla propojena funkčně, bylo jasné, kde nastoupit, aby se komunikační partnerka dostala, kam potřebuje, bylo snadné artikulovat pořadí či posloupnost jednotlivých míst, názvy zastávek atp. Přesuny mezi těmito místy byly pro komunikační partnerku nepodstatné; společně s ostatními komunikačními partnery je připodobňovala k cestě výtahem či metrem, kde pro ně projížděný prostor nemá žádný jiný význam než nutnou časovou investici spojenou s pocity ohrožení.[11] Ve výpovědích se tak ukazovala zkušenost blízká „tunelovému efektu" [Graham, Marvin 2001] či orientaci odpovídající silničním ukazatelům [Amin, Thrift 2002], jenž nebyla organizována do planární mapě podobné struktury, ale daleko víc odpovídala lineární organizaci verbálního popisu [Butler 1994] či schématické organizaci [Tuan 1975]. Ještě explicitněji je to vyjádřeno v následující citaci.

> To já ti nemůžu povědět, protože já nevím, kudy jdu. Jako já mám naučený trasy. Třeba od Petra mám naučenou trasu sem. Vím, kudy mám jít. Ale když jsme si jednou řekli, že půjdeme odtud, šel jsem třeba s Ondrou a on řekl, že to vezme přes nějakou industriální zónu. Tak já jsem vůbec nevěděl, kudy jdu. Nevím, myslím si, že ta trasa, kterou jezdím, je nejlepší, ale nemůžu to hodnotit, protože neznám ty alternativy. (M, 34, 16. 1. 2011)

[10] Prostor aktivit (*activity space*) lze charakterizovat jako soubor konkrétních míst, se kterými je člověk v přímém kontaktu skrze každodenní aktivity. Nejde o spojitý prostor, ale o lokality fixované pravidelným provozováním určitých činností [Golledge, Stimson 1997; Schönfelder 2006].

[11] Zkušenost s převráceným vozíkem v dopravním prostředku není mezi komunikačními partnery ojedinělá.

Zde se objevuje důraz na trasu, trasování a průjezdnost každodenního prostoru komunikačního partnera. Prostor je ve výpovědi organizován do „naučených tras", které jsou označovány jako „páteřní, vyježděné, sjeté, najeté" atp. Prostor mimo tyto trasy není podstatný, respektive není dostupný pro samostatný pohyb. Pokud se komunikační partner vydá mimo své „naučené" trasy, tak pouze v doprovodu průvodce, na němž se ale stává plně závislým. Taková zkušenost neodpovídá mapové představě prostoru a zpochybňuje její univerzalitu [Tuan 1975]. Technologicky a sociálně konstruovaná prostorovost vyjadřovaná ve výpovědích komunikačních partnerů si vytváří svoji vlastní prostorovou imaginaci, která odpovídá trasovému pojetí prostoru [Vujakovic, Matthews 1994; Matthews, Vujakovic 1995].

Dalším rozměrem prostorového znevýhodnění se ukázala kategorie měřítka jako striktně definovaná úroveň prostorového detailu. Diskuse poukazuje na jeho nesamozřejmou a sociálně produkovanou povahu vycházející z proměnlivých metrik lidské tělesnosti a rozsahu každodenních prostorových rutin. Ve výpovědích komunikačních partnerů lze objevit řadu odkazů odmítajících měřítkovou úroveň větší, než je vizuálně přehlédnutelný prostor (scéna) [Cosgrove 2005]. Globální, národní, regionální, ale dokonce i městská měřítka se ve výpovědích neobjevují. Trasová organizace prostoru či trasová prostorová imaginace se ve výpovědích komunikačních partnerů velmi úzce váží k měřítku lokální úrovně.

> Vím, že tam po té cestě mě vždycky něco zaujme, máš nějakej záchytnej bod. Na ten se ale musíš trefit. Takže jsem se na něj už prostě netrefil. (…) Nebo se mně pletly, myslel jsem, jako že je nemám po sobě uspořádaný. Já vím, že prostě jedu kolem toho a tady to už jsem viděl, tady ten panelák je prostě divnej. (M, 33, 28. 5. 2010)

Komunikační partner zde otevřeně ukazuje, co pro něj představuje trasa – respektive jak je prostorová informace pomocí trasové představy organizována. Nejedná se o kontinuální znalost určitého používaného koridoru, ale o posloupnost, naučené pořadí, schematický sled vybraných míst, seřazený soubor propracovaných obrazů jednotlivých lokalit abstrahujících od širších prostorových souvislostí. Jejich znalost je organizována procesně, jeden orientační bod za druhým. Sjetí z trasy automaticky znamená nutnost vrátit se zpět k poslednímu známému místu. Znalost těchto lokalit je však detailní. Komunikační partneři dokázali bez sebemenších problémů říci, kde se v rámci trasy nachází jaký povrch, kde jsou odpadkové koše, které obchody vystavují reklamní cedule, jaká je šířka mezi sloupy, kde parkují auta atp. Orientaci tak obdobně jako u zrakově znevýhodněných nezprostředkovávají vizuální dominanty [Park, Radford, Vickers 1998], ale fyzicky využívané nájezdy, přechody, nástupní ostrůvky anebo naopak změny povrchů, díry, obrubníky atp. Každodenní osvojování městského prostoru se děje skrze tuto tělesně zakoušenou materialitu prostoru, která se odráží v prostorové představivosti komunikačních partnerů [Simonsen 2007; Cresswell 2010]. Každá z aktivit reprezentuje jiný rozsah v prostoru a čase a vyžaduje jinou znalost detai-

lu [Brenner 2001], což v případě komunikačních partnerů vede ke zvýšené pozornosti k místům, kde je tato bezbariérovost komplikována. V rámci těchto nároků na pohyb prostorem jsou nadlokální měřítkové úrovně v rámci každodenních praktik komunikačních partnerů jen obtížně využitelné a dle Freundschuhovy a Egenhoferovy měřítkové typologie prostorů [1997] se ve výpovědích neobjeví úroveň vyšší než úroveň manipulovatelných a nemanipulovatelných objektů.

Třetí rozměr prostorového znevýhodnění, který se ve výpovědích objevoval hned v několika kontextech, představuje univerzální předpoklad kontinuity prostoru. Již v druhé citaci se ukazovalo diskontinuální pojetí prostoru, kdy komunikační partnerka ve výpovědi propojovala jednotlivá místa funkčně, nikoliv prostorově. Přestože se ona konkrétní citace vztahuje k cestě trolejbusem, vykazuje znaky popsané při využívání metra zahloubeného do tunelů, případně tras vyzdvižených nad úroveň povrchu [Graham, Marvin 2001]. Diskontinuitní vnímání prostoru zde však není způsobeno fyzickým či vizuálním oddělením od projížděného prostoru, popsaný pocit „placeless place" vychází z agendy, která je s využíváním hromadné dopravy komunikačními partnery spojena: komunikace s řidičem, pečlivé umístění vozíku na vyhrazené místo, připásání, vyjednávání se spolucestujícími, signalizace výstupu atp. – což výrazně znesnadňuje vnímání projížděného prostoru. Vedle ztíženého výhledu z dopravního prostředku z důvodu snížené výšky uživatele invalidního vozíku je „tunelový efekt" způsoben nemožností uvolnit pozornost od činností zajišťující bezpečné využití prostředku MHD.

Poslední uvedená citace pak ukazuje, jak lze projevy „tunelového efektu" nalézt i při samostatném pohybu na invalidním vozíku. V tomto kontextu je však pro jeho interpretaci vhodnější využít koncept kyborga [Haraway 1990; Gandy 2005; Shields 2006]. Hybriditu prostorové zkušenosti komunikačních partnerů lze nalézt v polymorfní identitě chodce i řidiče, jež se mezi sebou vzájemně prolínají v závislosti na konkrétní situaci.

> Jde o situaci, někdy to vnímám, jako že cestující autem a někdy jako chodec. Záleží na situaci. Podle toho jaký typ komunikace využívám. (Ž, 34, 17. 12. 2010)

Elektrický vozík má až třikrát vyšší rychlost než chůze. Zároveň jsou elektrické vozíky vybaveny předními, zadními i směrovými svítidly. Komunikační partneři vypovídali, že často kombinují využití chodníku se silnicí. V některých případech se jedná dokonce o nutnost, když je například přechod pro chodce na jedné straně spojen s chodníkem bezbariérově a na druhé bariérově. V takových situacích se komunikační partnerka stává řidičkou vozidla a jede po silnici tak dlouho, dokud ji bezbariérový nájezd neumožní silnici opět opustit. Ve výpovědích se však vyskytovaly i pozitivně konotované příklady, kdy změna identity komunikačního partnera byla zcela dobrovolnou volbou nabízející nové možnosti. Jednalo se o situace zácpy na silnici, pomalého tempa pěších na chodníku atp., kdy bylo pro rychlost a plynulost pohybu efektivnější obě polohy vzájemně kom-

binovat. Tato plynulost však není spojována pouze s efektivitou pohybu, ale současně i s určitým komfortem pohybu. Zatímco povrchy chodníků jsou podle slov komunikačních partnerů v daleko horším stavu než povrchy silnic, které jsou užší a uživatel vozíku je nucen v pravidelném rytmu daným velikostí domovních bloků zpomalovat a opakovaně sjíždět a zase najíždět na chodník, jsou zážitky spojované s prázdnými (např. nočními) silnicemi popisovány jako jakýsi vzor ideální kompatibility technologie elektrického vozíku a městského prostředí.

> … je to velmi příjemná cesta, v tom, že to jakoby nedrnká, nemusíš zachovávat směr, udržovat rovnováhu, nic, prostě vlastně jenom sedíš a jedeš. Vlastně tu hlavu můžeš jako pustit. Můžeš ji úplně vyprázdnit, je to velmi příjemné. (M, 33, 25. 8. 2010)

V tomto vyjádření komunikační partner hovoří z pozice řidiče dopravního prostředku. Citace ukazuje hybridizaci prostorové zkušenosti, která je prostřednictvím využívané technologie (podobně jako u osobního automobilu) naprosto oddělena od fyzické námahy či přímé tělesné zkušenosti s projížděným prostorem (nedrnká, nemusíš zachovávat směr, udržovat rovnováhu). Komunikační partner „může vypnout", „může vyprázdnit hlavu", vystoupit z konkrétního prostorového kontextu a vstoupit do onoho „placeless place". Dokonce se ve výpovědích objevily i zkušenosti popisované jako „mikrospánek". Pohyb prostorem po tzv. „vyježděných trasách" tak není vědomě kontrolován v celé své délce. Vědomá kontrola správnosti cesty se odehrává pouze ve vybraném počtu kotevních míst,[12] mezi kterými je vědomí podobně jako u konceptů mimovědomé senzomotorické zkušenosti [Piaget 1973], tělesné inteligence [Tuan 1975] či kognitivního nevědomí [Amin, Thrift 2002] uvolněno k jiným než orientačním aktivitám. Prostor komunikačních partnerů popisovaný v rozhovorech tak neodpovídá univerzální představě kontinuálního prostoru, ale souboru seřazených, prostorově oddělených míst.

Závěr

Příspěvek skrze analýzu výpovědí i diskuzi odborné literatury poukazuje na významovou mnohovrstevnatost konceptu prostoru v každodenním životě. Zatímco pozitivistické vědní přístupy dlouhodobě rozvíjely koncepci jednotného univerzálního prostoru jako rámce pro objektivní lokalizaci a reprezentaci jevů, postpozitivistické náhledy na utváření a vnímání prostoru akcentují pluralitu prostorovostí každodenního života. Tato pluralita vyplývá především ze situovanosti lidského vnímání a konstruování prostorových kategorií a vztahů. Ontologické

[12] Kotevními místy (*anchor point*) jsou v geografické literatuře označována nejvýznamnější místa, jako jsou například domov, místo zaměstnání, obvyklé místo nákupů atp., kolem kterých jedinec organizuje své každodenní aktivity a podle kterých i orientuje své prostorové představy [Golledge 1997].

kategorie každodenních prostorových taktik používané pro vyjádření vzdálenosti, směru, polohy či pohybu v prostoru jsou ukotveny v kontextu individuálně vytvářeného schématu prostoru. Jak naznačují dílčí diskuse, vytvoření schematizované představy žitého prostoru předpokládá kombinované uvažování řady dimenzí, mj. dimenze reprezentace, dimenze měřítka a dimenze dis/kontinuity. Žádná z těchto dimenzí není a priori významově fixována – v textu byly použity jako konceptuální rámce umožňující popsat kvalitativní rozdíly a sociální či technologické podmíněnosti uvažování měřítka a formy reprezentace prostoru.

Kriticky byla zhodnocena reprezentace prostoru v podobě mapy, jejíž přijímaná samozřejmost vyplývá z pozitivistického geografického diskursu a rovněž z tradice kartografického zobrazování světa. Diskuse odlišných forem organizace a reprezentace prostorových informací (trasa, panoráma, scéna) přenesla pozornost k odlišným, významově rovnocenným reprezentacím prostoru. Vedle dominantně přijímaného konceptu mentální mapy tak bylo popsáno etablování konceptu trasy, který umožňuje odlišnou, topologickou reprezentaci prostoru a který daleko více než vizuální rozměr zkušenosti zdůrazňuje jeho rozměr narativní či tělesný.

Forma reprezentace prostoru je úzce spojena s mírou její podrobnosti. Produkce schematizovaného obrazu každodenního prostoru je založena na abstrakci a škálování prostorové reality. Diskuse měřítka poukázala na skutečnost, že každodenní rutina se odehrává v různých sociálně, ekonomicky a kulturně konstruovaných měřítkových úrovních, které se často vzájemně prostupují. Tradiční kartografický pojem měřítka jako striktně definované úrovně prostorového detailu byl doplněn konceptem sociálně produkovaného měřítka vycházejícího z proměnlivých metrik lidské tělesnosti a rozsahu každodenních prostorových rutin.

Diskuse vnímané dis/kontinuity prostoru poukázala na nesamozřejmou představu „bezešvosti" městského prostoru. V této části textu byl pozitivistický koncept prostoru jako prostého lokalizačního rámce konfrontován s konceptem prostoru zaplňovaného vzájemně propojenými místy s významy. Takové pojetí převádí každodenní rutinní aktivity do prostředí sítě, jejíž tvar a struktura zahrnutých míst odrážejí kulturní a technologickou situovanost jedince.

Empirická pasáž, založená na zkušenostech pěti brněnských uživatelů invalidních vozíků, obsahuje výpovědi o formování technologicky, mobilitně či jinak podmíněných imaginací a reprezentací prostoru a prostorových taktik. Všichni komunikační partneři získali možnost samostatného pohybu prostorem až na prahu plnoletosti, tedy v době, kdy měli k dispozici elektrický invalidní vozík. Z provedeného výzkumu vyplývá, že jejich pohyb v prostoru se omezuje do poměrně malého počtu známých tras, které představují jakési tranzitní „tunely" propojující oddělená místa. Převládající reprezentace prostoru svými znaky dokládá jak jeho diskontinuitu, tak i jeho trasové pojetí. Znalost vyježděných tras je organizována procesně, v podobě naučené posloupnosti klíčových orientačních bodů, přičemž sjetí z trasy znamená nutnost navrátit se k poslednímu známému bodu. Reprezentaci prostoru v podobě mapy komunikační partneři v podstatě

nevyužívají. Charakteristická je pro ně také preference většího měřítka, neboť v individuálním pojetí prostoru hrají klíčovou roli i nepatrné vertikální nerovnosti – sjezdy, změny povrchů, díry, zábradlí, obrubníky apod. totiž umožňují a nebo naopak znemožňují průjezd určitou trasou.

Každodenní prostorová zkušenost komunikačních partnerů de facto integruje poznatky vyplývající z teoretické diskuse všech tří vybraných dimenzí prostoru. Pro jejich každodenní pohyb je totiž charakteristická jeho trasová reprezentace kombinovaná s preferencí velkého měřítka a typickým znakem je i diskontinuitní pojetí prostoru. Empirická část tak mimo jiné poukazuje na prostorový rozměr znevýhodnění, který vyplývá z rozdílnosti univerzální představy prostoru jako substance a každodenní prostorové zkušenosti konkrétních jedinců se specifickým typem mobility.

Ondřej Mulíček *je odborným asistentem na Geografickém ústavu Masarykovy univerzity. Dlouhodobě se zabývá dílčími tématy prostorového vývoje měst a sídelních systémů. Předmětem jeho hlubšího odborného zájmu je především problematika prostorových funkčních vztahů, mobility a každodenních časoprostorových rytmů v měřítkových úrovních města a regionu.*

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Daniel Seidenglanz *od roku 2003 působí jako odborný asistent na Geografickém ústavu Masarykovy univerzity. Zároveň je interním pracovníkem Centra pro regionální rozvoj Masarykovy univerzity. Mezi hlavní oblasti jeho výzkumu patří především geografie dopravy, přičemž se zajímá o roli mobility v každodenním životě, o integrační působení dopravy v sídelních systémech a také o geografii letecké a železniční dopravy ve střední Evropě.*

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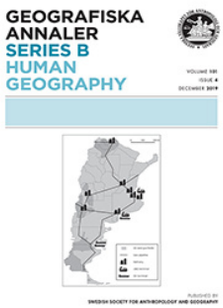

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ORIGINAL ARTICLE

Technologies and the representations of activity spaces of older adults

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ABSTRACT

Technology, in its various forms, mediates encounters between individuals and the lived time–space. Mobile phones, internet, navigation systems, and advanced transport technologies dramatically change the ways in which space and time are conceptualized, represented, and embedded into societal practices. This paper explores the routine spatiotemporal practices of older adults, who lie outside mainstream technology use. Attention is paid to the role of digital technologies in negotiating and representing the everyday activity spaces. We attempt to capture the logic of everyday tactics, which is based not only on rational reasoning and habitual spatial thinking but also on a more subtle mix of experiences, possibilities, and fears associated with the use of various technological devices and systems.

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Introduction

There is steadily growing geographic interest in topics related to the spatialities and temporalities of ageing. As Harper and Laws (1995) and Andrews et al. (2009) have noted, there is a great diversity of research areas, scales, and conceptual approaches in this field of inquiry. More recently, Skinner, Cloutier, and Andrews (2015) have confirmed that the 'geography of ageing' is prepared to absorb new theoretical developments within contemporary human geography. They have also uncovered 'the hidden geographies of ageing', that is, under-researched but prospective directions and themes, such as the biographies of older people or non-representational geographies of ageing. In this context, scholars also discuss relational approaches with an emphasis on spaces and places of older age as products of various networks integrating people, objects, practices, memories, and perhaps even technologies. Schwanen, Hardill, and Lucas (2012, 1293) speak in this respect about assemblages of human and non-human actants and their roles in shaping the everyday spatiotemporality of older adults.

Technology, especially information and communication technologies (ICT), together with other non-human actants, certainly has an important place in the relational perspective on the domain of contemporary everyday life (Crang, Crosbie, and Graham 2007). Technologies acquire multilayered meanings as they interact with various users, contexts, and practices. At the most basic level technology comprises artefacts (Bijker 2010); physical objects, such as steam engines, cars, mobile phones, computers, and credit cards, are often interpreted to explain the development of society in terms of its temporal and spatial organization. Technological artefacts, however, rarely work entirely independently of their broader contexts (Joerges 1988; Peters 2006). Instead, they are usually embedded in a variety of everyday constellations, inseparable from the social, economic, and political

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conditions affecting the lives of human users (Selwyn et al. 2003). Thus, technology in a broader sense should be conceptualized as a sociotechnical ensemble (Bijker 2010; Michael 2006) that links technological artefacts to the broader context of the practices, habits, cultural patterns, and motivations of technology users.

Gandy (2005, 38) describes the relationship between technologies and humans as a reflexive process in which technology plays a more important role in mediating the position of the individual body within the lived world rather than 'through the prosthetic modification of biological limitations'. In contrast, Øvergård, Bjørkli, and Hoff (2008) speak in this sense about a situation in which human users reveal the technologically mediated possibilities and experience of particular practical activities. Technology not only changes the individual's perception and experience of time–space, but it also modulates sociospatial relations (Kitchin and Dodge 2011) and coproduces new patterns of behaviour, norms, and ethics. If we accept the fact that spatial and temporal routines are important factors that enable people to identify themselves with a specific social group (Hardill 2009), then technology can significantly influence the form and extent of relations within the family, the local community, and groups of friends. The relationship between technology, users, and everyday societal practice, however, is not generally straightforward. According to Schwanen, Dijst, and Kwan (2008), context always matters, and the ways in which technology mediate everyday practices are largely shaped by a diverse group of determinants such as age, gender, socioeconomic status, bodily and cognitive capabilities, or the level of social inclusion (Hardill and Olphert 2012; Selwyn et al. 2003; Selwyn 2004).

This paper focuses on older adults and their recurring spatiotemporal practices. Special attention is paid to the role of communication and related digital technologies in negotiating and representing the spaces of routine everyday movements. Older adults are certainly important subjects within the research of technologically mediated activity spaces. They are generally considered late adopters of technology with declining spatial and cognitive abilities and relatively rigid spatiotemporal patterns of everyday routines (Barnard et al. 2013; Burns 1999; Vroman, Arthanat, and Lysack 2015). The growth of the older population, at least in most European countries, and the booming 'silver economy' have turned scholars' attention to uncovering more nuanced aspects of elderly life. Although comprehensive statistics help indicate the extent to which various technologies are adopted by older adults, they can hardly reveal the multiple ways and mechanisms in which these technologies are adopted at the microscale of everyday routine. In a study on mobile phone use Hardill and Olphert (2012, 1307) speak about the need 'to examine how mobile phones are spatially and temporally embedded in everyday relational practices'. They describe the different roles that mobile phones play as technologies and as artefacts and symbols in the life of older survey participants reflecting their different biographies and spatiotemporal contexts.

The objective of this paper, therefore, is to capture the seemingly banal logic of everyday tactics, which is based not only on rational reasoning and habitual spatial thinking but also on a more subtle mix of experiences, possibilities, and fears associated with the use of various technological devices and systems. We aim to describe the individual geographies of everydayness reflecting the 'bounded rationality' of the experiential space (Couclelis and Gottsegen 1997; Mondschein, Blumenberg, and Taylor 2010) – and meanings that are contextual and situated. Our research questions can thus be formulated as follows:

- What types of sociotechnical ensembles are associated with later life?
- What is their function within the spatiotemporal tactics of daily or weekly routines?
- How are activity spaces that are closely associated with technology use represented?

The first section of the paper will discuss current knowledge about the attitudes of older adults towards different types of technologies. The often-prevalent view of older people as late adopters of technology or as a technologically marginalized group within the mobile information society will be critically examined in this section and put into the context of the spatiotemporalities of

ageing. In the next section, the empirical part of the text, we describe the methodology of a case study carried out in the city of Brno, Czech Republic; we subsequently present the main empirical findings of the study and synthesize them to determine the role of particular technologies in the mobility routines of participants. In the final section we attempt to uncover the meanings and symbolism attached to the anchor points of everyday time–space and explain how technology shapes how they are represented.

Technology in the everyday life of older adults

Lefebvre and Levich (1987) describe the everyday as the intersection of cyclical and linear modes. Everyday life is cyclical as it emanates from the repeated rhythms of day and night, work and consumption, activity and rest. At the same time, the everyday also encompasses a linear component dominated by the one-way flow of time and rational planning and development processes. The nature of everydayness therefore lies in monotony, which is however not fixed, but is evolving and transformative. The spatiality and materiality of everyday life stem from the repetition of seemingly banal everyday activities (Simonsen 2007) such as eating, sleeping, working, shopping, and commuting. These activities construct the social concept of space (Felski 1999; Mulíček, Osman, and Seidenglanz 2016; Van Loon 2002), a referential norm through which the configuration of social life is measured, institutionalized and controlled, and synchorized and synchronized (Schatzki 2010).

Everyday living is pre-eminently a bodily experience (Bourdie 1990; Michael 2006; Simonsen 2007), and the human body plays a fundamental role in setting the pace of daily routines (Lefebvre, Elden, and Moore 2004). As Van Loon (2002) and Cresswell (2010) suggest, everyday relational space is produced by moving 'embodied minds' – the corporeal experience of space arises through movements, flows, and dislocations (Jensen 2009; Seamon 1979). The emergence of 'everyday technology' has increased (perhaps paradoxically) researchers' interest in everyday corporeality and relational place- and time-making. This is evidenced by studies on bodily encounters with technologies (e.g. McCreadie and Tinker 2005; Michael 2006; Øvergård, Bjørkli, and Hoff 2008) and on mobile and virtual spaces and cultures (e.g. Caron and Caronia 2007; Crang, Crosbie, and Graham 2007; Kitchin and Dodge 2011) and by more theoretical considerations of embodiment and cyborgization (Gandy 2005; Schwanen, Dijst, and Kwan 2008; Schwanen, Hardill, and Lucas 2012). In the case of older people, physical abilities and the associated appropriation of space are often discussed taking into account the effects of various technologies that transfer direct experience from the material to virtual space–time (Böhme 2013; Hardill and Olphert 2012).

Although 'older adults' comprise a very diverse social group, and any generalizations about them may be mere replications of stereotypes, we can still identify some specific factors shaping the daily routines of older people. Several researchers mention mobility limitations and related accessibility issues (Alsnih and Hensher 2003; Metz 2000; Rosso, Auchincloss, and Michael 2011), which are often accompanied by cognitive barriers and wayfinding difficulties (Burns 1999; Charness and Boot 2009). As one consequence, physical and social attachment to familiar environments, especially to home, is usually very strong. Home and the surrounding environment are the dominant anchor points of most of older people's daily activities and a stable base for making various social contacts (Križan et al. 2018; Phillips, Walford, and Hockey 2011; Vidovičová and Petrová Kafková 2012). Banister and Bowling (2004) understand social networking on a regular (daily or weekly) basis in a stable environment as one of the most important factors of quality of life in older age.

Time–space routines are tied to technology in varying degrees. In this context researchers often mention technology anxiety and less self-efficacy among the older population (Czaja and Lee 2009; Hardill and Olphert 2012), which may be due to the fact that the design of technologies does not correspond with the reduced cognitive abilities of older adults (Charness and Boot 2009; Selwyn et al. 2003; Vroman, Arthanat, and Lysack 2015). Selwyn et al. (2003, 562) point out that it is primarily ICTs that 'lie at the heart of older adults' participation in society in this century'.

Surveys among older adults reveal that, once initial barriers have been overcome, ICT use is associated with rather mundane benefits in terms of social contacts, general awareness, and security (Mitzner et al. 2010; Selwyn 2004; Vroman, Arthanat, and Lysack 2015). This finding is in contrast with the still low rates of ICT use by older adults, at least in Europe (Eurostat 2013, 2018). Statistics describing the availability and use of ICT in the Czech Republic in 2016 (Czech Statistical Office 2018) indicate that older households lag the least behind younger ones in terms of mobile phone use; 97% of older households are equipped with a mobile phone, compared to the national average of 99%. Computers, however, are owned only by one-third of households over 65 years of age; a similar percentage of older households have an internet connection (31%).

Statistically reported lower use of computers, laptops, mobile phones, and credit cards by older people should not always be interpreted as a deficiency that requires intervention. Selwyn (2004) describes the very selective integration of technologies into the daily life of older people – they are not ubiquitously present but used in specific situations and locales. The choice of technologies, frequencies, and ways of using them tend to be closely related to other, non-technological aspects of daily spatiotemporality (Burkitt 2004; Schwanen, Hardill, and Lucas 2012). For example, older adults in the Czech Republic actively use technologies that are generally perceived as obsolete by younger users. While only 3.4% of households under age 40 are equipped with a landline phone, 15.4% of households over 60 are and more than 25% of households over 70 are (Czech Statistical Office 2018). When interpreted from the relational perspective, it is apparent that these figures are not just a symptom of the technological conservatism of older people. They primarily reflect the embeddedness of this technology in the rather predictable, stable, and home-centred lifeworlds of its users.

Research design and methods

This study is part of a larger research project mapping representations of everyday routine spaces. The analyses and interpretations contained in this article are based on data obtained in a long-term research study conducted from spring 2017 until summer 2018. The research study consists of two interrelated parts. The first part involved a questionnaire survey, and the other part, focus groups and personal interviews. The surveys were aimed at older adults, that is, people aged sixty-five and older and were primarily conducted in Brno, Czech Republic, a mid-sized city of approximately 400,000 inhabitants. Brno is a regional centre in which modern development is closely tied to the classic and socialist industrialization of the nineteenth and twentieth centuries. In the postwar era the urban landscape and society were significantly restructured as large housing estates were constructed mainly in the city's outskirts. Today, the city's economy is highly tertiarized and benefits from the presence of major universities. Brno's population is relatively old when compared to the national average; however, the many students and relatively young daily commuters present in the city compensate for this fact.

The purpose of the survey was to obtain a basic, up-to-date overview of older adults' use of technology. Questionnaires were collected from 367 respondents (145 males and 222 females) with an average age of 68.6. The sample was limited only by age and was not stratified by gender, education, or income. The initial set of questions identified the technologies commonly used in daily life; respondents commented on whether they use a landline phone, a mobile phone, the internet, payment (debit or credit) cards, and global navigation satellite systems (GNSS) or map applications on a regular basis. The following types of questions were then asked to gain more details about how these technologies are used by the respondents as part of their daily routines: 'Who do you usually call?', 'Do you always carry your mobile phone with you?', 'Do you use a credit card when shopping at stores?', and 'Where do you connect to the internet?' Survey results enabled us to more effectively target focus groups and in-depth semi-structured interviews.

The interviews and focus groups were carried out with a stable group of approximately eighteen participants living in the large neighbourhood Líšeň located on Brno's outskirts. The local housing

stock is composed of both single-family houses and large socialist-era blocks of flats; the neighbourhood offers a sufficient range of services and civic amenities, and it is well connected to the city centre by public transport. There was a certain link between the participants as all of them were at least partly engaged in activities offered by the local senior club. Our existing relationships with this club was an important reason behind our selection of the study area and the particular participants. The group was rather diverse in terms of gender (women were slightly overrepresented), housing conditions (a balanced ratio between residents of single-family houses and housing estates), and marital and family status (married participants with adult children prevail); all participants, however, were retired, reasonably self-sufficient and without major health and social problems. Two introductory focus groups were held, followed later by personal interviews. Focus groups and interviews usually ranged from 90 to 120 min. They were only loosely structured to let the participants spontaneously describe how they use technology in their everyday routines, even in sometimes banal situations. The main purpose of the focus groups and interviews was to contextualize technology use and determine the meanings held and the roles played by landline and mobile phones, the internet, payment cards, and GNSS/map applications in the narratives of everyday life (these particular technologies were selected for discussion based on the results of previous surveys). Particular attention was paid to the influence of technologies on the representation of the times and spaces of daily routines. The focus groups and interviews were recorded; the recordings were transcribed and further analysed. Audio recordings and data processing were carried out with the informed consent of all participants.

Findings

Technologies used: an overview based on the survey

The survey aimed to acquire a basic overview of technologies available and their use and delimit the thematic scope of the follow-up focus groups and interviews. The survey findings are in many respects consistent with the national statistics quoted above in this text. The figures displayed in Table 1 confirm the very high percentage of seniors that routinely use mobile phones, as well as the fact that landline phones, despite their generally perceived obsolescence, are used by about a quarter of the respondents. More than one half of respondents regularly use the Internet. Additionally, the sample contained a relatively high percentage of payment-card users in the sample. In contrast, navigation and map applications, whether operated on a dedicated GNSS device or used on a computer or telephone, were the technologies used least frequently in routine practice.

The landline phone is a purely home-based technology according to the respondents. The phones of the vast majority of users (95%) are located in their homes and are primarily used to contact friends and family members. Landline phones are perceived as a temporally stable technology. The respondents 'are used to' these simple devices, a type of technology that has accompanied them from the journey through their careers to older life. Most respondents referred to the landline's relative stability, at least in terms of user interface, as its main advantage. Experience with landline telephone systems has been to some extent transferred to the practice of using mobile phones. Almost all respondents own a mobile phone and use it to make calls; approximately 74% of mobile owners use them to send text messages. Only a smaller number of respondents use them for other functions, such as browsing the internet, using social media, taking photos, and using navigation applications. Moreover, only two-thirds of respondents truly use a mobile phone as a mobile device,

Table 1. The percentages of respondents (older adults) commonly using a particular technology.

Landline phone Use (%):	Mobile phone Use (%):	Internet Use (%):	Payment card Use (%):	GNSS/map apps Use (%):
90 (24.5%)	352 (95.9%)	200 (54.5%)	226 (61.6%)	79 (21.5%)

carrying it with them all the time. About 20% of respondents take their mobile phones with them only when going for a longer trip, and almost 10% use them exclusively at home as a replacement for a landline connection. The strong role the home environment plays in the lives of older adults is also implicitly visible when querying the spatial context of internet browsing. Only 21 of 200 respondents who use the internet regularly browse the web outside of their homes using a mobile device such as a laptop or a mobile phone. Answers to questions concerning payment-card practices reveal that older users have broadly adopted this form of technology. More than 90% of cardholders regularly withdraw cash from ATMs, and almost three-quarters of them pay by card in brick-and-mortar shops. On the contrary, only 20% of cardholders are willing or able to use their cards for online payments (in this case, every third one needs assistance). These payment-card-related practices in the physical world are partly shaped by the efforts of older adults to maximize security. More than half of payment-card users exclusively withdraw money from trusted ATMs that they know well; more than one-third is willing to pay by card only in known and trusted stores. Navigation and map applications appear to be little used within regular time–space routines. As little as 17% of respondents get directions using navigation applications when needed in real time via mobile phones or other GNSS devices. Some of respondents combine real-time navigation with pre-prepared information. This is especially the case for planned, non-routine trips, when directions are usually obtained on the internet at home.

The bases of spatiotemporal practices

As stated in the introduction, technologies can be never abstracted from particular users, spaces, and times. Older adults often use technologies in contexts that generally differ from those of younger, economically productive users. Many widespread narratives (e.g. mobile phones helps organize time, internet banking is more comfortable, or a laptops enable working almost everywhere) do not seem to apply to the everyday life of older adults because their spatiotemporal practices, as well as subtle everyday tactics, are based on specific starting points. Analysis of the focus groups and in-depth interviews shed some light on the conditions that shape how technologies are adapted to daily routines. We have identified three groups of factors influencing the rhythms and spatiality of the participants.

First, home was referred to by most of the participants as a prominent anchor point of daily or weekly spatiotemporal routines. Very often, they contrasted the 'mono-nodality' of older age with the 'bi-nodal', work–home structure of the period before they retired:

> P1: Before I was always on my way between the house and work, and nowadays … I often do something around the house for the whole day.

Home, that is, one's house or flat in the narrower sense, is perceived as a focal point to which other places of lived everydayness are tied. These places, including the garden, local shops, the senior club, or the health centre, represent home in a broader sense.

Second, the participants often spoke about the recognizable decline of the influence of 'grand pacemakers' (working hours, school schedules, etc.). Instead of strong institutional pacemakers, micro-pacemakers help set their routines. These include television news programmes, morning walks with the dog, and other, often banal, regular activities that structure daily rhythms. Many of the participants feel less time stress as their daily or weekly time budget is relatively large. Some of them clearly described the opportunity to freely trade-off between time, space, and money. For example, some described choosing a more distant store where the same goods can be purchased for lower prices (trading time and space for money) or the tactic of taking public transportation only during off-peak hours when more empty seats are available (trading time for more comfortable transportation options).

Third, according to interviews, the patterns of daily movements of participants can be unstable in terms of timing. Daily schedules are controlled by several factors, the most important of which is

perceived state of health. In many responses, health is directly linked to individual mobility – heath impairments can limit or postpone otherwise regular physical activities:

P2: Sometimes my feet hurt so much in the morning that I do not go shopping at all.

People's financial situation or weather conditions are other factors shaping older people's daily maps. However, occasional deviations from usual habits are interpreted not as flexibility but more in a negative light as disruptions. The participants are used to meeting their friends and neighbours in certain places at certain times – if they are not there, it could mean something extraordinary, such as an illness or accident, has occurred.

Everyday technologies

These three bases of spatiotemporal tactics are translated into the semiregular daily routines of older people in various ways and intensities; technology plays a significant role in mediating and forming this process. Technologies, especially communication technologies (landline or mobile phones), have proven to be important agents producing specific spatiotemporal constellations. The methodology we followed to conduct interviews led to rather implicit and little-structured descriptions of technology use; our goal was to capture the technologies in everyday life and not everyday life through technologies. Still, the following text is structured by particular technologies, solely for the sake of interpretative clarity. Attitudes, rhythms, and typical situations, as they appear in the rather unstructured narratives of the participants, are attributed to individual technological systems (landline and mobile phones, the internet, payment cards). We do not pay any attention to navigation applications because they were not mentioned during focus groups and in-depth interviews to an extent that would allow a meaningful interpretation.

Although according to national statistics and the results of the survey only about one-third of older adults use a landline phone, this technology was frequently mentioned by participants. Some of them have had their landline connection for a long time, especially those who did not move after retiring. This could testify to the obsolete nature of this technology, which has remained in certain households as a relic of past sociotechnical ensembles. However, this view entails oversimplification, as in some cases landline phones were recently installed in several participants' households as part of internet or cable television packages. Terms such as *obsolete* or *old-fashioned* were not directly used by interviewees; the age of landline technology was often associated with positive characteristics, such as 'simplicity', 'user-friendliness', or 'inertia'.

The landline telephone seems to be a crucial technology for those who own and use one, mainly in terms of social networking. The landline phone, unlike the mobile phone, is perceived as a technology enabling long conversations. Respondents justified such use based on inexpensive flat rates for calls (compared to monthly payments for mobile plans). Nevertheless, there are also other, non-financial, contexts that make the landline phone an important medium for social interactions. Communication via landline phone requires a stable network of counterparts, trusted and equipped with the necessary devices. At the same time, it produces a specific time–space as it is a purely home-based technology that enables users to 'enter' the homes of friends and relatives, very often at usual or prearranged times. The landline phone is therefore perceived as a technology covering relatively intimate spaces and times of relations within a semi-closed network of people. Calls outside of this network (authorities, healthcare services, etc.) are made much less frequently and are of lower social importance.

All participants interviewed use a mobile phone. Mobile telephony entered the lives of these older adults relatively late – either towards the end of their economically productive lives or even after retirement (the GSM network was introduced in the Czech Republic in 1996). The mobile phone is used mainly as a communication technology and is perceived primarily in this sense. Participants usually use mobile phones only for occasional communication and text messaging. However, they do not see the mobile as a device only serving a certain function but also as a symbolic artefact. If there is

a single symbolism shared across the group of participants that can be associated with the mobile phone, it is security:

> P3: Each time I leave the house, I check to see if I have my wallet, keys, handkerchief, and mobile phone in my handbag.

The mobile phone is considered an emergency communication device, a 'last resort' technology if things go wrong. Some participants reported that their mobile phone was bought by their children or grandchildren as a means of remote monitoring, used especially in case they are not reachable at the usual time in the usual place. For some participants an incoming call on a mobile phone is as stressful as a landline phone ringing at unusual times (e.g. at night) – it may indicate that something serious has happened.

According to the interviews, there is only a very weak connection between mobile phone use and the spatiotemporal flexibility of older users. The mobile phone does not fundamentally affect the steady time–space rhythms and patterns of most of study participants:

> P3: Yes, I feel safer with it, but that's probably all … I definitely do not change my routes, I do not go out in the evening more often or anything like that …

Only a few participants use the mobile phone for last-minute spatial synchorization and temporal synchronization. On the contrary, many of them consider phone-based coordination to be inadequate and note that agreed-upon meeting times are now ignored more often since the onset of mobile phones. Participants themselves primarily use paper calendars or diaries for time management. Many also criticize the overwhelming presence of mobile technology, as their phones often ring in the wrong places at the wrong times (at the shop, at the doctor, at home late at night). The mobile phone is, thus, not a technology for real-time control within their daily routines, but rather a receiver or security tool.

Like mobile phones, the internet too is not a real-time technology for participants. It is not used very frequently and is most often closely linked to home life, home-based computers and, occasionally, to some form of assistance from other people (typically children or grandchildren). For study participants the internet is primarily a source of information; they most frequently visit news and health websites (they still get most of their news from television, however). Some of them use the internet to find solutions to specific, often quite banal, problems that occur in everyday life (e.g. how to make pear marmalade, how to clean chocolate stains). They also frequently mentioned using the internet to prepare for long journeys. Although many participants can access the internet while travelling via mobile, they prefer to collect all necessary information (departure time, weather forecast, route itinerary, etc.) well in advance at home:

> P4: I always look for everything in advance … my son gave me a printer, and so I print it and take it with me. I make a kind of book.

This mention of a 'book' is a convenient symbol of the effort of participants to treat the internet as a kind of home library and, at the same time, to have crucial information available in an analogue, non-digital form.

The internet is also used as a communication channel. Most participants are familiar with the use of e-mail; however, they still strictly distinguish between traditional letters or postcards and electronic messages. Compared to e-mails, classic mail is perceived as more trustworthy; e-mails are viewed as ephemeral and uncertain, unsuitable for a binding communication. Not all participants, however, still write traditional letters, as landline-phone calls are a sufficient alternative to written communication for some.

Payment cards (mostly debit) are commonly incorporated into the daily lives of interviewed study participants. Although they agree that this is a practical technology, they concur that a great deal of caution is needed when using it. The introduction of the cashless transfer of pensions to bank accounts was the main trigger for respondents to get payment cards. Therefore, many participants

opted for payment cards not as a practical technology, but rather as a necessary tool for accessing money saved in the bank.

Participants treat payment cards very seriously because they feel that misuse can result in a loss of money. Many also view withdrawing money from ATMs as potentially problematic and therefore adhere to certain temporal and spatial tactics for minimizing possible risks:

> P5: Yes, I often withdraw money from the ATM, but only from the one in the bank building and only during the bank's opening hours … If there are any problems, then someone can help me.

Like survey respondents, the interview participants have built up a network of known and trustworthy ATMs, which are important spatial anchors for some of them. This network can be quite stable over time:

> P1: Often, I drive to withdraw cash to an ATM in the city centre … Why there? There was one of the first ATMs in Brno, and I got used to it somehow … It has to be the safest ATM because it is located at the headquarters of the savings bank.

The spatiotemporal aspects of ATM withdrawals also clearly demonstrate the efforts of participants to combine (non-human) technology with human contact or assistance, at least in the case of non-standard situations. The presence of bank officials helps reduce the uncertainty associated with technology use. This logic is repeated in other situations; for example, some participants chose busses over trains for long journeys due to the close presence of the driver.

Technology and representations of activity spaces

In Kant's view, space (and time) is a medium that can represent the complexity of entities and events that have mutual (spatiotemporal) relationships, including relationships to the individual body. Such a space is, at the same time, intuitive – it is shaped by the various forms of intuition and representation (Allais 2009; Böhme 2013). In this respect, Böhme (2013, 462) notes

> By intuitive space … I mean … that the space in which we intuit our everyday praxis. Intuitive space is not the same as the space of perceptions … . Nor is it space as a form of intuition in the Kantian sense, because it is not a medium for the representation of things. In everyday life we do not represent the things in our environment, we perceive them. However, to some degree we overlay our perception of the environment with patterns of representation … . We organise our presence according to the patterns of possible representation; that is, we perceive things, but we intuit them as this or that.

The intuition of everyday life, as well as the ways in which people represent their everyday spaces and practices, differs substantially from scientific, objective, and mathematically based spatial representation. While objective representation is produced from a disembodied 'bird's-eye view' employing complete and exact information, the subjective representation of the everyday stems from the situated, often incomplete knowledge of the insider within an experiential space. Everyday representations of space often lack Euclidean logic and metrics, they privilege discourse over graphic expression, and their meanings are contextual, revealing the observer's situatedness or positionality. They also possess strong functional and emotional dimensions (Kwan 2007).

In reality, everyday perceptions and representations are enacted through a complex of generally mundane technological artefacts; the times and spaces produced by technologies interplay with the individual's experiential space (Michael 2006). Technologies usually do not transform the spatiotemporal referents of concrete entities (Aurnague and Vieu 1993), as we will demonstrate below. They do, however, have the power to reshape 'diverse material and discursive practices' (Kitchin and Dodge 2011, 67), producing relational spatialities and temporalities. Technologies coproduce the meanings, tactics, and norms associated with particular places and times, sometimes disrupting and overlaying the ontological security and patterns of representation of the lived world.

The intuitive space of the participants, described and interpreted verbally in in-depth interviews and focus groups, is undoubtedly organized around the home as we have already mentioned. The

study participants' narratives confirm the perceived high ontological safety of home in both physical and symbolic terms; home is a place or region that provides independence and security, and is shared only with a limited number of well-known actors and actants (Milligan 2009; Mowl, Pain, and Talbot 2000; Sýkorová 2008). Home involves most of the pacemakers that structure regular everyday temporality and synchronization patterns; it is seen in this respect as a key locale of the slowed-down tempo and rhythms of older adults (see Lager, Van Hoven, and Huigen 2016). The boundaries of home are, however, rather fuzzy. While some call home only a flat or a house, others have a broader understanding of the term – they also include other places deeply integrated into their daily routines, such as a garden or the nearby residences of their children. ICTs have several implications for how home is represented (see Figure 1). On one hand, home is represented primarily as a technology-free environment. Thus, the symbolism of home, its daily rhythms, and basic functioning are independent of ICT use. On the other hand, many participants referred to some ICTs as home technologies or domesticated technologies – this concerns almost exclusively the landline phone. The mentioned domesticity of landline technology reflects its stability in everyday practices. From an ontological point of view it is a temporally stable technology that has not undergone any dramatic changes in appearance or use. The regular use of a landline phone assumes the existence of stable communication counterparts, that is, known people that are allowed to enter the home. Landline phone technology, thus, does not interfere with the 'home-as-a-shelter' narrative; instead, it can be viewed as extending the home to spatially distant entities and actors that are in line with domestic rhythms.

Internet technology is related to the representation of home in a more complicated way. Some participants treat the internet as if it were a library, newspaper, or television. Simple content consumption then makes the internet a purely home-based technology. Nevertheless, there is another representation of home linked to internet activities – some participants narrated the home as the basis for planning longer trips outside of familiar spaces. Retrieving information about weather,

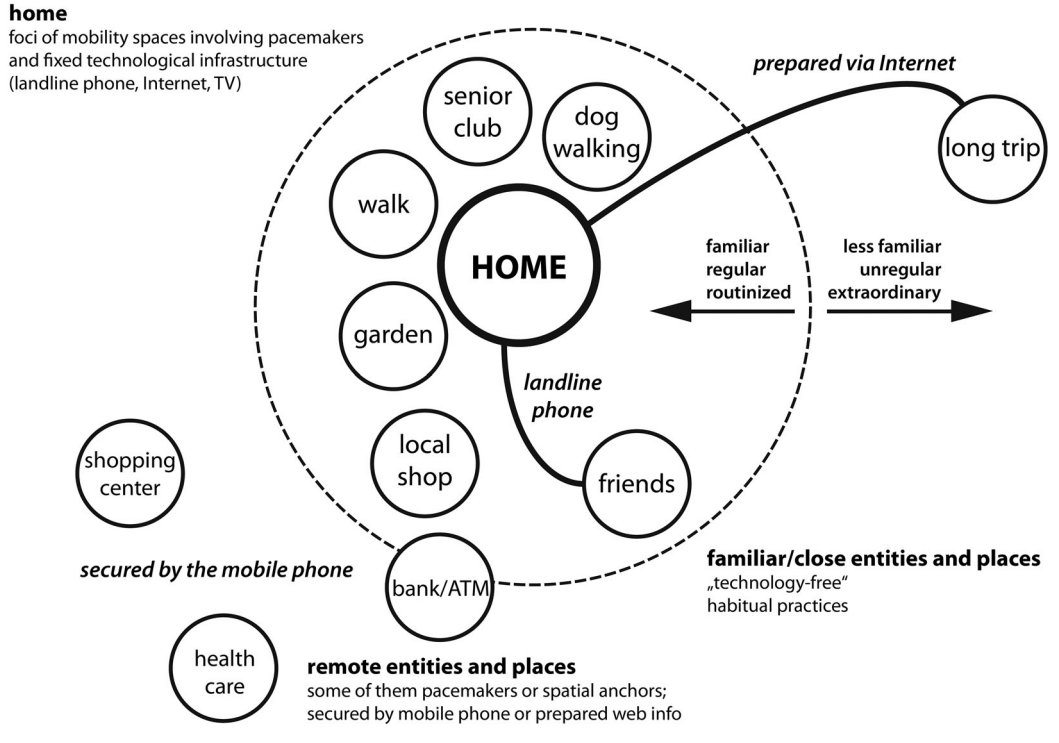

Figure 1. A simplified diagram of the representations of participants' activity spaces.

timetables, routes, or traffic is carried out in the home domain. Although many participants know how to get this kind of data from the internet from almost anywhere, they strongly prefer to do it in a 'protected environment' to avoid having to improvise and experience insecurity. In this specific case, they represented home as the point of departure of extraordinary spatial mobility (visiting friends in a distant part of the city or another town, going on a trip with the senior club, etc.), and internet-based preparation is an inherent part of the trip or journey. Analogically to the notion that technologies can remediate neighbourhood life (Crang, Crosbie, and Graham 2007), the landline phone and the internet contribute on a more subtle scale to the spatiotemporal remediation of home.

Spaces and times outside the domain of home are represented primarily through the prism of security and accessibility. Security risks were mentioned quite frequently by participants –getting lost, suffering an acute medical emergency or accident, or being robbed. The very essence of risk-limiting tactics is thus non-technological (at least in terms of using ICT). These tactics require distinguishing safe routes, locations, and times from less secure ones, based mostly on repeated experience (see Figure 1). The participants perceive and, through repeated practices, reproduce representations of safe time-spaces that include or exclude certain elements, such as stairs, pedestrian crossings, barrier-free public transport stops, and railings. Mobile technologies, however, do not play a greater role in shaping these representations. While participants admitted that mobile phones increase their general sense of security (see also Mitzner et al. 2010 or Hardill and Olphert 2012), they, at the same time, denied that this technology affects their choices of destinations or routes. In other words, they do not see this technology as a positive means for more flexibly appropriating and representing unfamiliar time-spaces (Phillips, Walford, and Hockey 2011).

One technology, the payment card, generally does not serve to loosen regular spatiotemporal habits; instead older people seem to make their daily patterns more rigid by using this technology because study participants, out of security concerns, often use only a limited range of trusted ATMs (sometimes only one) at strictly defined times. These devices thus play the role of significant space–time anchors around which regular routines are organized. Only ATMs in certain locations are trusted, moreover only at certain times (e.g. during the bank's opening hours, during the day). These points provide a strict structure to how the local environment is perceived and represented; they are spatiotemporal anchors, that is, not pacemakers but markers (Thrift and Parkes 1975) that define slots or daily fragments suitable for specific types of activity (Hubers, Schwanen, and Dijst 2008). There are, of course, other markers that older adults use in their spatiotemporal routines, such as the opening hours of stores and institutions or public transportation off-peak times. Nevertheless, ATMs are a clear case of an information technology that was introduced into a certain stage of the life of older adults and brought along qualitatively new demands on technological absorption, usage ethics, and risk assessment. These demands interplay with existing perceptions of routine time–space and produce new patterns of movement as well as new subjective representations (Couclelis 2009).

Concluding discussion

In a study on mobile communication in everyday life Caron and Caronia state that new technologies to a certain extent 'eliminate certainties but do not replace them with another reference system' (2007, 18). Similarly, Dourish and Bell (2007) describe how the 'cultural organization of space', that is, imaginations, symbolism, and meanings inscribed into space, is eroded and transformed by technologies. What types of uncertainty does technology bring to the lives of older adults and what reference systems are adopted to counterbalance them? If we focus primarily on the spatiotemporal impacts of ICT, we can identify the spatial and temporal tactics used as tools to minimize uncertainty. In general, we can speculate that participants prefer seemingly inflexible temporal and spatial disciplination and strict regionalization of the lived time–space in order to cope with uncertainty.

First, the socially accepted omnipresence of communication technology comes into conflict with the existing structure of older adult's routines. Our society of permanent contactibility and ubiquitous computing is fluid, as mobile technologies are used across various contexts (Dourish and Bell 2007; Galloway 2004; Michael 2006; Mol and Law 1994). Mobile phones and mobile internet are technologies that are not associated with a particular locale; they are decontextualized in terms of specific times and places and multilocal in their nature (Caron and Caronia 2007). Mobile technologies represent and produce placeless and fluid space-times, in which older participants do not function comfortably (Philips, Walford, and Hockey 2011; Sýkorová 2008). The participants in our study prefer spatializing the timing of their activities, including making phone calls and internet browsing. The role home plays as the typical locale for many technology-related activities symbolizes the domination of the stable mundane rhythms of the household over the technologically conditioned separation of activities from what the participants consider to be their proper places and times. The home becomes the focal point of the reference system counterbalancing perceived technological fluidity.

Second, Michael (2006) mentions the tendency of members of the mobile society to be unprepared. He notes the overreliance on information and actions conducted in real time with the aid of technology. A missed bus, a forgotten address, an invalid ticket – these are example of emergency situations that most people routinely deal with in real time thanks to mobile phones. It seems, however, that the emergency tactics of our study participants are much less coupled with the use of technologies. Instead, they are more closely related to preventive spatiotemporal planning in an effort to ensure human contact in case extraordinary situations arise. Planning specific routes and times, as well as pre-preparing information, are ways of minimizing risk through appropriating the right places and times. ICT devices, such as mobile phones, are not the main tools older adults use for problem-solving; instead they are a back-up means of emergency communication.

Third, many contemporary ICTs aspire to be integrators of various everyday routine activities (Hubers, Schwanen, and Dijst 2008). A mobile phone is more than a phone – it is a navigation tool, a means of payment, a calendar, a flashlight, a television, a book, an internet browser, a word processor, and so forth. As such, it interweaves a number of contexts into a broad sociotechnical system symbolized by a single mobile technological artefact (Bijker 2010). However, the fact that individual contexts are permeable via mobile phone may be perceived as uncertainty and discomfort by older people. The narratives of participants are clearly compartmentalized in this sense, as they tend to recognize sociotechnical systems as relatively self-contained environments attached to one particular technological artefact. They seek to limit the hybridity resulting from using a technology outside of its usual place and time. The contexts of their individual technologies are thus separated by clearly articulated boundaries; representations of places and times are relatively unambiguous within the given sociotechnical system.

The research presented in this paper points out some of the nuances of the relationship between the spatiotemporality of older adults and selected information and communication technologies. We attempted to contribute to the body of knowledge within the relational geographies of ageing (Horton and Kraftl 2008; Schwanen, Hardill, and Lucas 2012; Skinner, Cloutier, and Andrews 2015) interlinking the biomedical concept of the 'ageing body' with the materiality of technological artefacts as well as with the domain of related sociocultural practices. This understanding of relationality is somewhat different from Hopkins' and Pain's concepts of intergenerationality and lifecourse (Hopkins and Pain 2007). The relational approach employed here provides a framework for understanding older age not as a distinct life-course period based on the chronological time indicators but as a mosaic of complex ongoing projects embedded in different types of situations and networks. The paper links 'being old' with specific everyday geographies stemming from various 'assemblages of human and non-human actants' (Schwanen, Hardill, and Lucas 2012, 1293).

Because we can expect a further strengthening of the role of various technologies in everyday life, we need to look more closely at the diverse contexts of technologically mediated place-based practices. The paper, therefore, draws mainly on the microscale-level research that concerns

'contextualization of self and identity in later life' (Andrews et al. 2009, 1649) as a part of everyday experience. It presents technology as an important, however multilayered constituent of the spatio-temporal structuration of the later life. Empirical findings, seen from the standpoint of technology studies, confirm the need for more thorough integration of the concept of sociotechnical ensemble (Bijker 2010) into the research on spatialities and temporalities of older adults. They indicate that there are no placeless and timeless technologies but technologies that are anchored to a particular moment, place, practice and person. The spatiotemporal activity context described in the paper represents a bridge interlinking technology issues with the perspective of geographical gerontology. These are primarily the themes of home, emplacement, and spatiotemporal stability which call for the research schemes adressing the role technologies play in later life.

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Shifting prominence of places and times: multiple centralities of socialist Brno

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Shifting prominence of places and times: multiple centralities of socialist Brno

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ABSTRACT

This paper aims to take a closer critical look at the multiple and multi-layered nature of urban centrality. Centrality is conceptualized here as a kind of prominence, perceived, planned and represented quality within the urban timespace. We employ three distinct ontological categories of the urban centre (centre-as-event, centre-as-thing and centre-as-structure) to take a deeper insight into the symbolism, ideological narratives and planning practices behind the genesis of the prominent urban places and times. With this approach, we expose even the seemingly subtle phenomena that (co-)shape multiple urban centralities. We are empirically focusing on the case of the city of Brno (Czech Republic). Attention is paid in particular to the period of socialism, more specifically to the influence of socialist ideology on the reorganization of urban central places and times. We are trying to overcome the traditional view of centralized and all-encompassing socialist transformation. Instead, the socialist Brno provides the case study to demonstrate a subtle fabric of overlapping, competing or simply coexisting socialist and pre-socialist centralities. We argue that the physical re-centralization of the city was in the end less significant than the efforts to symbolically recode the urban environment.

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Introduction

The draft of the strategic vision of 2019 for the city of Brno (Brno Municipality 2020), a half million urban core of a distinct metropolitan region, contains, among others, a specific objective: development of balanced network of local centres within the territory of the city and the metropolitan area. Echoing the ideas of compact city (Dieleman, Dijst, and Spit 1999; Kjærås 2021), the polycentric policies (Kloosterman and Musterd 2001; Sýkora, Mulíček, and Maier 2009) and the principles of short distance cities (Zhang et al. 2022), the strategic objective evokes the thoughts of the proper configuration of the city in the search of even accessibility, spatial justice and sustainable mobility. More than fifty years earlier, in 1966, the city planning document (UHA 1966) describes the city centre of the socialist Brno as overburdened with production and retail functions. The planning solution was to invest more in secondary urban centres planned for newly

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emerging housing estates. The availability of services at a reasonable distance from the place of residence is seen here as an important parameter of working-class housing. These two examples, distant from each other in time, are linked through the theme of urban centres and centrality. Both documents cited above deal with a rather blurred category of centre, a taken for granted concept whose loose definition is, however, not an obstacle for being deeply embedded in the urban structures, images and narratives.

We could find many other examples of referring, either explicitly or implicitly, to the urban centres and centralities which meaning is captured in multiple contexts. The centrality represents an abstraction (Davies 1967) and the urban centre can be conceptualized in many ways – as a cluster of specific functions, node of communication networks or the high-density peak (Lynch 1981; Thurstain-Goodwin and Unwin 2000). These analytical types are usually not in conflict but fuse together into a multilayered attribute of the urban place. Porta and Latora (2007) speak in this respect about the prominent nature of urban centres – centrality translated as a prominence is a kind of perceived and represented quality, which contains notable symbolic dimension. The symbolism of the urban central place stems not only from its functional attributes but strongly refers to its role within everyday praxis, planning paradigms or normative policies. Paraphrasing McFarlane's arguments about density we can see centrality as 'a topological problem connecting multiple concerns and spaces in ways that have consequences for other spaces, some planned and some unplanned' (McFarlane 2016, 631).

The main focus of this study is put on the symbolism associated with the understanding of urban centres as prominent urban sites. In this sense, we seek to capture the ways in which that prominence is represented in narratives of urban politics, reflected in planning practices, and permanently negotiated through the spatiotemporal rhythms of urban life. The binary between the central and the non-central emerges from specific configurations of *concerns and spaces* as referred above. It is continuously established through the cycles of everyday urban routines and, at the same time, evolves within the linear passage of time. We therefore argue that urban timespace in each period of city development is structured by a subtle fabric of overlapping, competing or simply coexisting centralities. They are not only linked to the respective societal and political settings, but also reflect various historical inertias, sedimented functional patterns as well as future-oriented planning narratives. In our view, the urban environment always operates in a mode of multiplicity of centralities – capturing the tensions and interplays between them is another of our research aims.

The multiplicity of centralities is closely linked to ontological uncertainty concerning the very nature of the urban centre. We therefore propose to employ here three strands of ontology, i.e. event-ontology, thing-ontology and structure-ontology (Urry 1995; Merriman 2012). Within this framework, we conceptualize *centre-as-event* as primarily spatiotemporal entity. It is a kind of happening that attaches prominent activity to specific place and time, event, which is sequential, often regular in nature. Medieval market, Sunday Mass or annual military parade are the examples of prominent events occupying and constituting central places and times. *Centre-as-thing* refers to material continuity across time and space – urban centrality is embedded into physical entities such as square, town hall or shopping mall. They represent persistent locales of prominent

events possessing causal powers on other entities within urban timespace (Urry 1995, 67). *Centre-as-structure* ontology highlights the relational nature of centralities. Centres are perceived as coupled with periphery – Harvey (2009, 16) contends 'there can be no centre without a periphery and each helps to define the other'. The existence, symbolism and meanings of urban centres are thus closely tied to non-central places. However, it must be said that the categories mentioned are significantly intertwined in the reality of urban life. Their meanings conflict or fuse across space and time, they can be repeatedly reproduced during the urban transition, appropriated within new urban contexts as well as rejected and replaced.

In order to empirically ground the outlined arguments, further exploration of centralities is situated into the context of the socialist city. The socialist city, in our particular case Brno in the former Czechoslovakia, is not the object of interest here per se, rather it is used as a framework for detailed empirical insight. In the context of the study, it is grasped as an urban scene with relatively clearly articulated actors, legible symbolism and centralized planning policies corresponding to grand ideological narratives. Socialist urbanism represents here a contextual background with a strongly developed ideology and symbolism of novelty. This setting is the stage for an almost schematic illumination of prominence/centrality as a quality referring to the emergence of the new and modern. The narrative of the construction of a 'new' socialist society allows us to direct the debate towards the multiplicity of centralities – the discussion that to some extent questions the archetypes of urban ordering.

The research questions could be formulated as follows: What symbolic as well as functional qualities were associated with the prominence of an urban place in a socialist city? What were the discrepancies between centres planned through socialist normative policies, centres lived in everyday reality, and prominent places transitioning from previous pre-socialist periods? What events, structures and artefacts symbolized the multiplicity of centralities in the timespace of the socialist city? The formulation of the research questions is to some extent subordinated to the pursuit of an innovative conceptualization of centrality as a concrete abstraction. Presenting empirical examples of event-like, structure-like and thing-like-centres, we seek to extract Urry's ideas on ontologies (Urry 1995) from purely theoretical sociological discourse and situate them in the specific power-constellations of socialist urbanity. Doing so, we are able to conceptualize the nature of prominence/centrality in a non-reductionist way. We differentiate urban centres from other elements of the urban fabric through the presence of specific prominent events and symbolisms. At the same time, quite in the sense of Urry's ontological triad, we point out how these events, symbologies or singular artefacts are produced and, above all, reproduced in time and space. The conceptualization presented here links prominence to policies and planning schemes that aim to reproduce and materialize it within more permanent spatiotemporal structures. We consider the chosen conceptual approach to be beneficial, primarily because of the possibility of capturing a relatively abstract urban quality at different ontological and scale levels, even beyond the empirical domain of the socialist city. In the specific case of centralities, it enables us to account for more subtle manifestations of prominence, moving beyond the universal, yet inherently reductionist models of urban space–time organization.

Pre-industrial urban archetypes

A brief historical overview is needed when dealing with the phenomena of the urban centrality within the timespace of the European city. Urbanization as a complex process spanning across different economic systems, political regimes and technological ensembles, according to Soja (1986, 263) revolves:

> … around a socially constructed pattern of nodality and the power of the occupied centers to both cluster and disperse, to centralize and decentralize, to structure spatially all that is social and socially produced. Nodality situates and contextualizes urban society by giving material form to essential social relations.

Each stage of the city development introduces new nodalities replacing the previous ones or, more often, adding new material or symbolic layer into existing structures. We can speak about metastability in the case of the European city which is represented by the longevity of build-up forms and functional patterns (Bagnasco and Le Gales 2000). While the material form of the European city evolves at a rather slow pace, the dynamics took place especially in the level of symbolic contextualization that was, and still is, deeply linked to various modes of urban governance and planning (Schlaffer 2013).

The medieval European cities have been quite compact for a long time. Whether cities were planned or organically grown, authors (Hohenberg 2004; Hoffmann 2009) recognize some universal features of their centres. The centrality was expressed in the physical layout of the medieval city. Central square (or dominant street) represented in most cases the geometric centre, a public place with outstanding and just accessibility that was crucial for maintaining transactional function. Churches and town halls were common near the square symbolizing religious-political power. A medieval city centre was a pragmatic place enabling concentration, a stage for performing everyday urban drama (Mumford 1961) as well as a venue for ceremonies and festivals that co-defined the urban identity. It was not only everyday pragmatism that was reflected in spatial layout of a medieval city, but also medieval imaginations of the ideal urban form. Lilley (2009) draws the attention to the imaginative picture of celestial city of Jerusalem as an archetype for representing the shape and structure of the medieval city. According to Harvey (2009, 260–261) the representation of medieval social ranking referred often to these cosmic images as sources of prestige and morality. The pragmatic, symbolic and imaginative levels mingled together to create rather monocentric pattern. The physical and functional form of the medieval city has long been codified both in urban everyday practice and in urban planning theory as a 'structural template, which might be referred to as the natural town' (Hart 2015, 1).

Abstractions of industrial city

The advent of the early industrial city of the late eighteenth and nineteenth century was driven by the completely new interplays between actors and processes of modernizing and re-stratified urban society. Distinctly different lifestyles, routine practices and mobilities arose gradually hand in hand with the emergence of new forms of materialized spatial and temporal prominence. Growing spatial separation between place of residence and workplace prompted the emergence of new social and mobility patterns. Urban land

became commodity subject of trade and economic speculation leaving aside the traditional family ownership and relatively stable land tenure of the feudal time. The urban market reflected not only the performance and needs of local economy but also the integration of the city into supra-local trading chains. Finally, paid industrial work disrupted the mosaic of seasonal urban beats and homogenized to some extent the rhythms of the city (Thompson 1963; Urry 1995; Harcup 2000).

Interrelated processes of capitalist modernization and industrial urbanization affected not only the urban size, densities and mobilities. They opened more room for abstract urban space and abstract urban time to enter the realm of urban practices. Abstract timespace complemented the pre-industrial urban timespace consisting primarily of singular places (Stanek 2008) defined in terms of social activities embedded in particular localities and times, material settings, circadian and seasonal rhythms. Empty time of mechanical clocks together with two-dimensional instrumental spaces of production, consumption, politics, ideology and planning represent according to Lefebvre (Lefebvre 1991; Gottdiener 1993; Stanek 2008) a concrete abstraction that interplays with so called social space – the space of daily life in singular places. Spatiotemporal abstractions of the city do not necessarily correspond directly to specific material and social urban forms (Gottdiener 1985). Instead, referring to well-known Lefebvre's triad, they shape the ways how these forms are perceived, conceived and lived (Lefebvre 1991).

The advent of industrial society, thus, did not automatically imply a complete disappearance of the previous urbanities and imaginations. It brought plurality of city-related abstractions – there was a multiplicity of representations of urban space and time imposed upon different realms of spatiotemporal practices in order to appropriate, measure, study, organize or control them. Cities were represented as machines born of industry-led modernization, as arenas of competing demands for space, as sites of class struggles, chaotic Babel mixing communities, races and cultures or as nightmares saturated with decline and moral destruction. Multiple images were echoed, and discursively reconstructed at the same time, by early urban analysis, planning projects, visions and utopias – work of Thünen on agglomeration economies (Fujita 2012), Friedrich Engels' depictions of English industrial towns (Engels 2007), Comte's, Spencer's and Geddes' ideas of the city-as-organism (Park 1921; Batty and Marshall 2009), or broadly developed concepts of human ecology (Low 1996).

Many of those concrete abstractions kept the issue of centralities in focus as they understood centres as resources of power and authority (Hall, 1997). It was primarily Chicago School of urban sociology and neoclassical land use theorists that linked central location with the exercise of spatial dominance. They drew up the model 'of urban community floating in reified, two-dimensional space organized by horizontally deployed forces emanating from the city center' (Gottdiener 1985, 37) that for some time stabilized the image of urban practices organized around a single core (Soja 2000). At the same time, the horizontal expansion of the industrializing city, both in material and functional terms, anchored the abstractions of centres on a higher scale level. The original preindustrial or early industrial city of commerce and mercantile capitalism (Soja 2000) became a pivot point for larger agglomerated territory, peripheral in its nature, consisting of residential or industrial suburbs. Subcentres often emerged contributing to more nuanced and usually hierarchized image of centralities within the city of the industrial age.

Approaching socialist centralities

The theoretical constructs discussed above will be empirically grounded in observations and retrospective analyses made in the city of Brno, Czech Republic. Brno, the third largest city in the former socialist Czechoslovakia, was both an exposed stage and the subject of various types of ideologically motivated policies and planning schemes between 1948 and 1989. That's consistent with what Zarecor states towards socialist urbanity:

> … the cities become spatial and cultural manifestations of the socialist system itself, inextricably linked to the regimes in power during their design, construction, and expansion … (Zarecor 2018, 96)

Although the long phase of socialism cannot be seen as a homogeneous stretch of linear urban development, in the case of the forthcoming empirical section we approach this period as a kind of temporal container. It provides boundaries to confront both material and immaterial urban structures of socialism with the (pre-socialist) past while putting emphasis on multi-layered processes of socialist urbanization and industrialization (Bernhardt 2005). The focus is primarily on the complex consolidation of socialist ideology in the material and immaterial structures of the city. This was not a straightforward process, as it involved multiple interactions between territorialized pre-socialist legacies and the onset of socialist organization of urban economy and society – this interplay gives a birth not only to new socialist material structures but also attaches new functions, symbolisms, narratives and rhythmicities to the places of pre-socialist past (Stenning 2000; Murawski 2018). The political dimension of making of the socialist Brno overlaps with the economic one as the socialist urbanism based on industrial productivism was permanently challenged by the lack of investment and the deep underdevelopment of urban consumer services.

As Hommels (2000) states, the city is an ensemble that comprises both material and social elements interwoven by functional as well as semantic and ideological ties. In the case of this paper, the exploration of socialist centralities in Brno is based on looking for concrete abstractions that co-define the logics of socialist/industrial city ensemble. These logics are inscribed into routine rhythms, powers and planning narratives attached to specific urban infrastructures, as well as into changing centre-periphery topologies. The debate on planning abstractions of socialist city can refer to several conceptual frameworks. First of all, there are Healey's thoughts on binary of uniplex and multiplex urban ordering (Graham and Healey 1999; Healey 2000). We argue that socialist Brno showed some significant features of uniplex city model – concentrated and centrally controlled planning power reflected in rather homogeneous representation of the city as a site of production and housing. Uniplex socialist city can be abstracted as a singular timespace with stable rhythms as well as stable hierarchy of places. Patsy Healey describes the spatial outcomes uniplex ordering as follows:

> The city was presented as a kind of 'jigsaw', the separate pieces making up a hierarchically ordered pattern. People went to work in the nearest business. They shopped at the nearest foodstore. They went to the city center for their durable shopping and cultural recreation. (Healey 2000, 521)

As an antithesis, multiplex city shows plurality of various spatio-temporalities and therefore it lacks the background of a single dominating urban image.

The uniplex/multiplex binary is echoed also in the concept of socialist homopolis, standardized and monoculture city, which finds its opposite number in heteropolis – differentiated and permanently negotiated urban timespace (Gentile, Tammaru, and Van Kempen 2012). Homopolitanization is understood here as an ideologically embedded ideal of urban development – a materialized vision of an egalitarian and collectivist society that was manifested primarily in the form of centrally allocated housing. Although the concept of homopolis is somewhat schematic (Sjöberg 2014; Neugebauer and Kovács 2015), it represents another attempt at a retrospective view of socialist concrete abstraction. Importantly, homopolis is not described as the actual state of the socialist city, but as a never-finished path towards socialist utopia. This approach thus leaves a conceptual space for the operation of pre-socialist structures that interact with the gradually introduced socialist planned urbanities.

Finally, Zarecor (2013, 2018) comes up with infrastructural thinking and socialist scaffold as interconnected concepts that allow for a more precise capture of the relationship between ideology and materiality under socialist regimes. This is not so much a simple transposition of the contemporary diction of the infrastructural turn (Amin 2014) to socialist realities as it is a conceptualization of the concrete abstraction of the modernist socialist city. As in the case of the uniplex city or homopolis, the motifs of developmental linearity and total control over the city as a technically and socially plannable unit resonate here:

> The universal aspiration for a socialist city was that it operated continuously as a synchronized instrument of economic production and social transformation in physical space. (Zarecor 2018, 101)

Infrastructural thinking can be seen as an operationalization of the ideology building a new modernity. As Tuvikene, Sgibnev, and Neugebauer (2019) note, investments in infrastructure were primarily measured by their benefits to socialist industrialization. Socialist modernity was thus the modernity of industrialism based on predominantly technicist planning culture. The nature of socialist planning can be illustrated, for example, by thesis of the socialist Institute for Philosophy and Sociology in former Czechoslovakia (1973, 65):

> When we plan a certain production, we plan not only the production of certain consumer goods, but also a certain type of labour and a certain circle of needs, all of which are interrelated. We are also projecting a certain profile of human life, including its limits.

Planners sought ' … to convert the diverse meanings of the objects in daily life […] into new, channelled meanings … ' (Humphrey 2005, 55) and to connect the new materialities and meanings into a functioning whole – a socialist scaffold according to Zarecor (2018).

Looking back at the three conceptualizations of socialist urbanity presented above, we can say that socialist centralities in their planned form were part of a hierarchized abstraction of the machine-like city, embedded in urban utopia with clear spatio-temporal topologies. The question here is to what extent was this abstraction tied exclusively to the socialist countries of the Soviet bloc? L'Heureux (2015) argues that the material and visual parameters of cities on both sides of the Iron Curtain may have been very

similar at certain times. She explains this by the similar conceptual underpinnings of modernist architecture referring to the internationalized planning, architectural and technological discourse of the pre-World War II period. In this sense, Murawski (2018, 910) refers to Lefebvre's view that built socialism did not create any architectural specificity or built space of its kind. Even after World War II, the physical form of many cities in the socialist/Soviet bloc was influenced by Western planning ideas. The degree of influence depended on the current political constellation, the openness of experts and the availability of technology. An example of such similarities (and at the same time differences) can be seen in the projects of the Brno housing estate Lesná (1962–1970) and the urban district Tapiola (1952–1970) in the suburbs of Helsinki/Espoo. The Tapiola project, like Lesná, was created as cooperative housing, also in response to the housing crisis. Both projects respect some of the principles of the garden city, in both cases inspired by the modernist concepts that emerged from the interwar CIAM congresses. Both housing complexes contain large multi-storey monolithic buildings, the pedestrian and other traffic routes are separated, and they are also used to a large extent as (monofunctional) dormitories (Zadražilová 2013). Prior to the development of the housing estate, the official discourse in the Eastern Bloc promoted a functionalist concept (strict standardization, efficiency, speed) supported for political and economic reasons.

Despite the aforementioned external material features of modernist architecture linking the post-war development of many cities across the Iron Curtain, it is necessary to return to the importance of the underlying concrete abstraction. The concrete abstraction of the Eastern Bloc socialist city was quite different from that of Western city. Wu (2003) highlights the paradox of the socialist system: although cities played an important role for the socialist policies enforcement, the support of industrial urbanization contrasted sharply with suppression of rich and differentiated urbanism. The city was a locale of intense political symbolism and the container of industrial production. In this sense, the architects of Tapiola were not as strictly bound by the mandatory typification of materials as were the authors of the Lesná design. Socialist architects had to adhere much more closely to the discourse of functionalism – strict standardization and speed of construction – necessary to effectively ensure the industrial function of Brno. The implied socialist abstraction of the city had a far greater impact on everyday life. Stenning (2005, 985) states:

> Social lives too were constructed through the workplace and, through the particular pattern of employment, housing and social mobility, domestic lives were shaped in large part by relations of production and work status.

However, the planned social and symbolic conversion did not always translate totally into the practice of everyday socialist life. The prominent places and times promoted by the socialist regime clashed and fused with the sedimented structures of the pre-socialist past. Materiality and rhythmicity of socialism only gradually and not always successfully layered over pre-socialist patterns of urban practices, place-based meanings, and local symbolisms.

Brno fairs – central events of socialist Brno

An obvious ideological obsession of the socialist regime for the modern and futuristic results of socialist work was reflected in the adoration of novelty. The new becomes a

collective object of interest, belongs to the socialist man and becomes central. What is old becomes marginalized and should, if possible, be pushed to the very periphery of the abstract model of society and the city. The socialist mass media of the time regularly highlighted urban spaces that represented the new. The regime's efforts to define a new centrality were saturated mainly by the demonstration of symbols at specific events during which individual was involved into the collective rhythm of the city. A socialist man was supposed to socialize and, in particular, he was not supposed to be at home, since the family was no longer the ideological basis of society. Official symbolic events, intertwined with bureaucratic and ideological lines, were to define (new) central spaces, since only such a location corresponded to their significance.

In the case of Brno, the showcase became the trade fairs, whose physical premises from the pre-socialist period (thing) were filled with current socialist content. Holding fairs (events) was a matter of prestige and a symbol of progress – a sculpture 'New Age' was installed in front of the fairgrounds itself. The exhibition centre was a place of strong visual all-encompassing symbolism, a localized centre of progress. Preference was given to exhibitions related to the priorities of the manufacturing sector. Particularly the Engineering Fair, held with an annual periodicity every September, was a prominent time point in socialist Brno, an important marker in the passage of the city year. The dominant positions in the programme of exhibitions were occupied by engineering, automotive industry, agricultural technology and other sectors symbolizing material progress. Beginning with the first International Engineering Fair held in 1959, all the following fairs were such significant events that they temporarily altered the city's usual centralities – all parts of the city, including its everyday historic core, were subordinated to the exhibition centre for the duration of the fair. Brno's main Vítězství Avenue was newly illuminated with neon lights, following the example of the fair: 'If all the neon lights are lit every evening, then Vítězství Avenue will truly have fair lighting' (Rovnost 1959a, 1). A similar effort to subordinate the functioning of the city to the fair is evident in many other instances. Completely new restaurants, cafés, and a health centre of their own were opened right on the fairground. Citizens were motivated by political leaders to increased social disciplination (calls to citizens to behave in a representative manner), surveillance of prostitution in the city was intensified, and there were often calls to speed up daily activities. Any manifestation of backwardness or slowness was criticized as unacceptable. Therefore, the contemporary press uncompromisingly attacked even local businesses during the fair: 'for example, the brewery, as if it had to choose the shabbiest vehicles to supply the fair, a showcase of the best' (Rovnost 1959b, 3).

Despite all the ideological efforts, however, the fair was a singularity lasting only a few days, so it naturally encountered the limits of the usual everyday spatiotemporal organization of the city. After just a few days of the fair, the congestion of the fair and city infrastructure became usually apparent. Therefore, Brno citizens were urged 'to refrain from visiting the Exhibition Centre on Saturdays and Sundays and postpone it to a weekday', i.e. to give priority to those who would get to the city only on the weekend (Rovnost 1959c, 3). The organization of public transport in the city was positively evaluated for the number of passengers transported, but also criticized for the failure to manage the overlap between extraordinary and normal operations. Although the transport capacity proved to be generally sufficient, the new temporary centrality was more difficult to

manage at specific times. The opening of the fairs coincided with the start and end times of work shifts, and thus 'at a time when working hours at the factories were ending and thousands of citizens were streaming in and out of the fairgrounds, Brno transport was passing a very difficult test of readiness' (Rovnost 1959d, 1). At the same time, the unusual working hours of the technical staff and gardeners, who had to work at night to ensure cleanliness and order in the exhibition grounds, were emphasized.

Modernization and the new centre-periphery perceptions

Socialist industrialism was inevitably related to the existence of collectivist and highly disciplined urban society. There was a strong industrial culture enrooted not only into economic strategies but also deeply into social policies and planning schemes. Collectivist industrialism was the source of a strong temporal discipline derived primarily from the unifying rhythm of industrial plants. As the socialist regime promoted social dimension of the industrialization process, many services, and amenities, like child-care, education, recreation facilities, healthcare, retail-opening hours, working hours of institutions or public transport scheduling were orchestrated with the regular shift work in Brno industry. Plants were introducing its beat as collectively shared and accepted socio-temporal norm into private domains of everyday life. As pointed out by Sommer (2018, 238), 'the central unit of social planning was industrial enterprise which was in charge to apply social planning to its employees, their families and surrounding towns and regions'. The socialist factories therefore played a significant role in shaping the quotidian life of the urban dwellers (Mulíček, Osman, and Seidenglanz 2016).

Big state enterprises were also endowed with relatively large economic resources and planning powers, which made them strong agents in the fields managed primarily by local and regional authorities (Illner 1992). The building and construction industries were in a strong symbiosis with design and planning bodies. They were mainly involved as an implementing force of urban planning concepts, as providers of technologies necessary for the realization of spatial visions. Kalášek (1962, 86) states that

> A condition for rapid housing construction in Brno is the building of a high-capacity panel factory – a 'factory for flats'. […] In addition to housing units, however, it will also be necessary to build schools, kindergartens, nurseries, shops and service establishments in the housing estates in the prefabricated manner.

This symbiosis did not necessarily work when locating production plants. Kalášek (1962, 87), as chairman of the City National Committee, pointed out that large industrial enterprises had a very negative impact on the environment in the city centre (especially the air). For this reason, he states that 'One way to remedy these health defects is technical measures directly at the factories, […] furthermore, efforts to gradually relocate industrial plants from the inner city to its southern outskirts'. In this sense, however, Voženílek et al. (1957, 165) argue that 'industrial construction is the most important town-forming factor', so the establishment or relocation of such enterprises may then inevitably face problems.

The dominance of industrial manufacturing enterprises was so clear that it linked the periphery and the centre through a unified rhythm. In this sense, Linhart and Vítečková (1975, 368) write in a socialist period study that:

> From the point of view of the basic working regime, the masses of the working population were subordinated to the industrial rhythm […] the differences between the various classes of Czechoslovak society were minimised in terms of the length and rhythmisation of working time.

The rhythms of the formerly agricultural communities in the hinterland adapted to the industrial temporality of the enterprises in the urban cores. The industrial workforce in the Brno metropolitan area was mobile thanks to efficient transport infrastructure. On the one hand, mass commuting played the role of a factor blurring to some extent the distinction between rural and urban routine, while on the other hand it co-created a binary between the modern industrial centre and the non-industrial, thus less modern periphery.

Lack of individual choice as well as strong bureaucratic control found their spatial dimension in relatively fixed system of urban districts and rayons. They co-defined spatial granularity in many fields of everyday urban life, as the inhabitants were assigned to particular kindergarten, elementary school, health-care centre, post-office or housing authority primarily based on their place of residence. Although the system in socialist Czechoslovakia was not nearly as strict as e.g. in the Soviet Union, the inspiration from the soviet projects is obvious. In this vein, Strakoš (2011) draws attention to the contributions of the Czech avant-garde scene, which already referred to the models of Magnitogorsk (rayonization) or (Velky) Zaporozhye (Socgorod) in the 1930s. The micro-rayons system, which was associated with the emergence of local centres, is often seen as a sign of the formation of a new inter-urban centrality of the socialist city. The effort to break down the traditional structure-ontology was obvious: 'we have not yet managed to create a valuable counterpart to the famous historical squares and boulevards that would highlight the collectivity of contemporary life' (Starý 1960, 148). However, filling the ideologically profiled urban micro-centres within with pragmatic content was not a simple matter. Building shopping malls, branches of municipal services or post offices serving the residents of the district was not a one-off change – rather, it was a process of accelerated evolution that was doped with ideological heroism.

The socialist urban society was unwaveringly confronted with the historical inertia of centralities, with the physical and cultural sediments of the pre-socialist period. Using the distribution of Brno retail floor as a kind of proxy indicator, we can document only gradual shift in commercial-based prominence of the newly built socialist shopping malls and marketplaces. In the pre-socialist period, retail was the clear denominator of the capitalist city centre. In 1965, the city centre represented 50% of the total retail floor in the city and the planning documents at the time stated: 'insufficient facilities in developing housing estates put an excessive burden on the city centre' (UHA 1966, 48). However, in 1976, there was a decline of just 8 percentage points and in 1988, the centre still offered one third of the city's retail capacity. This is a symptom of the very slow redistribution of some services to districts within densely populated and ideologically supported prefabricated housing estates. Despite celebrated builder's heroism, the pragmatic goal of providing the basic service functions in the housing estates was never sufficiently fulfilled. The reason was the lack of investment resources, as well as the socialist regime's dismissive attitude towards retail and services as unproductive, 'redistributive only' sectors. The low number and limited capacity of not only shops but also schools, post-offices and other public amenities had a double impact. First,

there was overloading of the housing estates' service infrastructure – long queues as well as the unavailability of much of the product range in the afternoon hours were clear daily reminders of the socialist economy of scarcity. Secondly, the use of services in traditional city centre locations naturally became the basis of the adaptation strategies of estate residents. The spatiotemporal logic of these strategies was determined not only by the pre-socialist accumulation of services there, but also by the radial organization of public transport system, in which the city centre played the role of a central transfer hub. This functional inadequacy retroactively eroded the planned symbolic value of the new centralities. The idea of the dilution of the centre-periphery structure was shattered in the socialist everydayness precisely by the contradiction between ideological/symbolic and functionally perceived centrality.

Materialized symbolism of socialist centralities

The ideological anchoring of socialist regime within the city structure gave rise to tense place-based symbolism. As Strakoš (2011) states, following the example of the Soviet Union and partly also Marxist-Leninist ideology, the socialist regime in Czechoslovakia aimed to fill public space with elements of regime propaganda. This was a step towards a rather fundamental transformation, since until 1918 the environment of Brno was dominated mainly by religious and monarchist symbols, or also by ordinary (capitalist) advertising. The celebration of the Communist Party, or the ideas and visions that the regime wanted to put forward, clashed precisely with the older anchored materialized centrality. In the historic core of the city, which was traditionally permeated with historic sacral buildings, between 1948 and 1989 dozens of public art works (sculptures, mosaics, plaques, monuments, etc.) were installed. Of this number, however, only 2 sculptures carried content adoring the future, prosperity or speed, simply everything that the regime paid attention to. A few artistic realisations were created in honour of patriotism, revolutionary movements in the nineteenth century or as a commemoration of the liberation of the city by the Soviet army. The historic core in this sense therefore remained rather a pre-socialist open-air museum, a place of old and ideologically unproblematic works of art whose individuality did not need to be covered up.

Although the regime never quite succeeded in occupying the old city centre with the materiality of symbols, it fully conquered the newly built residential blocks. A number of different artistic realisations were created in the space of the housing estate blocks, referring to progress and socialist modernity, commemorating the anniversary of the liberation of the Czechoslovakia or glorifying femininity – motherhood. Compared to the historical core, the socialist artefacts here had an overwhelming superiority over other symbolic elements. The emergence of these artistic realizations was fundamentally supported by the existence of the so-called four percent law, which since 1965 defined that one to four percent of the total budget of the construction of the housing estate had to be used for the artistic decoration of the public space. Thus, in the case of housing estates, an enormous monolithic building boom stood in contrast to artistic individualism – but it was an individualism of authorship, not of content. The sculptures in the housing estates, called Sun and Movement, Music from the Cosmos or Light for Humanity, are not a reminder of individual personalities, but a tribute to collectivism.

The logic of small-scale socialist symbolism installed in public space can be transferred to the large scale of entire housing estates, as these were perceived not only in a utilitarian but also in an ideological dimension. Housing blocks are symbol in themselves. They represented materialized utopias of socialist planners, the functional as well as aesthetic symbols of the care of socialist man. They were created as an industrial product, as a reflection of a fixed rhythm known from industrial production and presented as an argument to opponents, as an affirmation of the reality of socialist urban politics. From the point of view of the geometry of the city, housing blocks were located mainly in non-central, peripheral positions. Their centrality was therefore to be developed in terms of other qualities – in terms of the symbolism of novelty, social justice and socialist welfare. However, the reality was rather the life of two cities in one – a schizophrenia of utilitarianism and ideology, of sleepy everyday life and glorification, of reality and fiction. In some cities in Central and Eastern Europe, the socialist spatial transformation resulted in the creation of entirely new urban centres, but this was not the case in Brno. The striving for something new, for a new centrality, but also the constant impossibility to break away from the old centrality accompanied Brno throughout the socialist period. The old historical core has always stood in contrast to the new socialist materiality. As the previous chapter suggests, the pre-socialist core remained the key functional centre of urban services, while in terms of visible and tangible material size, it was overshadowed by socialist housing developments. The housing blocks are thus the largest and most significant, though not the most central, thing that socialist Brno has built.

Conclusions

The conclusions may start with reiterating the opening thesis on multi-layered nature of urban centralities. The case study of socialist Brno was intended to draw attention to the manifold of perspectives on production and metamorphosis of elements that take on a prominent meaning not only within material but also within symbolic (time)space of the city. There are multiple reasons for focusing the study of centralities on the very period of the complex and never completed transition from the pre-socialist urban settings to the new abstraction of the socialist city. The incorporation of socialist policies into the functioning and symbolism of the city was intended as a rapid and all-encompassing transformation. The grand planning goals were clearly ideologically anchored, and the socialist authorities had effective tools in hand for their centralized and directive enforcement. Early socialist Brno thus represents a 'laboratory' that shows the multi layered process of building a completely new concrete abstraction of the urban order. Although the empirical evidence from Brno necessarily refers to a localized culture, symbolism and historically accumulated experience, it provides some knowledge transferable to other urban settings. First and foremost to the cities that have been exposed to more or less similar contexts and processes of socialist transition, including the belief in technological progress and the drive for social levelling and secularization. However, it should be noted that some of the insights into the reorganization of urban central places can be extracted from the specific space and time of the socialist city and applied in their more general sense. As such, they can contribute to the interpretation of shifts in the perception, planning and living of prominent places and times related to any other major transition of a particular city, be it political, cultural or technological-economic.

The presented text interprets 'building the socialist city' as an effort to attach the ideologically relevant meanings to the specific urban places and times – making them prominent not only within the material structure of the city but also within the lived socialist everydayness. Shifts in prominence represent a kind of transformation, during which new urban places and times become pivot points of the city's new everydayness as well as symbolic emblems of the new order – in the words of Zarecor (2018), the new socialist scaffold. In reality, it is a set of subtle processes, seemingly banal when compared to abstract political or economic narratives, in which new things, objects, events, norms and symbols are being added into the existing tissue of rhythms inscribed deeply in the physical and functional structure of the city. The reorganization of urban centres towards the socialist ideal cannot therefore be understood as a simple replacement of the pre-socialist abstraction by another, socialist, homogeneous abstraction of the city. In the case of Brno, we show that the political-economic narrative of the transition from the capitalist to the socialist form of the industrial city is fragmented and complicated when viewed in detail. We argue that against the backdrop of the 'grand narrative' of building a socialist Brno, a far more subtle negotiation of meanings, symbols and physical matter took place, even in an urban-geographical (non-architectural) sense.

The centrality or prominence is approached through the ontological categories of thing, structure and event not to demonstrate any typologies, but to demonstrate the ways in which centrality can be thought about. We show among others how crucial the immaterial environment is for understanding the nature of urban centrality. The advent of the socialist regime in Brno did not change dramatically the existing identity of the industrial city materialized in the form of factories, railway stations, workers' canteens or other prominent places of industrial urbanism. The transformation has primarily affected the immaterial realm – everyday mobility, lifestyle, or the spatiotemporal disciplination of society. The familiar industrial ethos of the city was re-contextualized and underpinned by new political, ideological and symbolic motives emphasizing progress, supposed technological supremacy and novelty. The symbolic space prepared in this way subsequently enabled the transformation of the real, lived places in the city in terms of their functional or ideological prominence, as shown by the example of the Brno exhibition centre. The symbolic interconnectedness of socialist urbanity with industrial production foregrounded industrial enterprises as focal points of everyday life, capable of redefining centre and periphery not only in spatial but also in temporal terms.

The socialist plans to challenge pre-socialist place-based meanings were to go hand in hand with attempts to intervene in the physical structure of the city. New material objects entering the public space were to replace the previous prominent elements of the pre-socialist city that represented its feudal or industrial past. However, the initial heroic idea of a rapid redrawing of the map of existing historical centralities proved to be beyond the economic power of the socialist regime. Physical intervention was thus associated only with local-scale rebuilding and demolition actions. As the performance of the socialist economy waned over time, the impotence of the regime to materialize ideological goals became increasingly apparent. As a result, newly built housing estates became the key tangible elements of the socialist concrete urban abstraction in the case of socialist Brno. These were to become a real counterweight to the historic city centre, filled with ideological pathos to compete with the historically accumulated symbolism of the old urban core. At the same time, perceived through the prism of centrality,

housing estates were the materialization of the collectivist understanding of life in the industrially rationalized socialist Brno. Thus, the housing blocks can be seen a figurative, spatially embedded symbol emphasizing the prominent role of industrial production in both the life of the individual and the spatiotemporal structuring of the city.

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