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For an analysis of contemporary urbanization

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Introduction

Time as infrastructure

For an analysis of contemporary urbanization

Natalia Besedovsky, Fritz-Julius Grafe , Hanna Hilbrandt 
and Hannes Langguth

Overlapping and interlinked dimensions of time are shaped by and, in turn, structure contemporary urbanization and everyday life. This Special Feature debates the implications of such temporal dynamics for our cities: It explores the making of temporalities, the power relations in and through which this process is embedded, and the inequalities that its effects entail. Beyond definitions that focus on the material characteristics of infrastructures, the Special Feature understands temporalities themselves as infrastructures: structures that underlie and powerfully shape current forms of social organization and interaction. Considering time through this analytic lens promises to elucidate the ways in which political, social and economic conditions shape and exert authority over the everyday urban, as well as the material and social effects of such dominations. The papers assembled in this Special Feature unite scholars from different disciplines, probing this infrastructural lens to understand the structuring effects of urban temporalities in relation to central issues of contemporary urban development, including urban mobility and transnational migration, the politics of financializing urban infrastructure, urban energy transitions and climate risk. Moreover, thinking through the making of temporal infrastructures—that is, disentangling temporal authorities and their underlying power structures—allows thinking through opportunities for action and political change. In sum, these contributions advance three aims: to strengthen and enrich the analytical notion of infrastructure; to facilitate new knowledge about the construction of present, past and future temporalities; and to unveil potential entry points for social interventions that aim to establish empowering approaches towards urban equality and inclusion.

Key words: urbanization, infrastructure, time, temporal rhythms, urban temporalities, urban inequalities, social organization

Introduction

‘We do chores. You live life’, proclaims the official slogan of TaskRabbit, an online

platform providing mundane services (<https://www.taskrabbit.com/>). Whether it concerns the tiresome obligations of domestic work, daily chores, moving house, or finishing one’s homework, the platform’s

employees—described as reliable and ambitious rabbits—offer their services for individual needs, promising to enable their clients to enjoy the benefits of metropolitan life. While such services help clients free up time for leisure activities or speed up their careers, they also imply increasing reliance on uncertain, temporary, and precarious working conditions for many of the platform's employees. TaskRabbit exemplifies the importance of time—as a currency, structure, or value, and its manifold forms of impacting people in contrasting ways.

The divergence of temporal experiences is reflected in different and partly contradictory portrayals of present notions of time. Throughout the Western world, authors describe the acceleration of the everyday through demands of interactivity, multitasking, and hyper-solicitation in the course of rapid technological and socioeconomic change (Rosa 2015; Wajcman 2008). On the other hand, experiences of disconcertion, stagnation, insecurity, and waiting challenge these narratives of acceleration under late capitalism (Auyero 2012; Jeffrey 2010a). The precarity of large segments of the job market, the uncertainty of rights of residence for many refugees, the struggle to balance work and life, or the marginalization of communities that lack basic infrastructures are cases in point.

This Special Feature debates the implications of these temporal dynamics for our cities. It explores the making of temporalities, the power relations in and through which this process is embedded, and the inequalities that its effects entail. We probe the concept of infrastructure to facilitate an understanding of the structures and practices that underlie these processes (Angelo and Hentschel 2015). Beyond definitions that focus on the material characteristics of infrastructures, *we understand temporalities themselves as infrastructures: they are structures that underlie and powerfully shape current forms of social organization and interaction*. Considering time through this analytic promises to elucidate

the ways in which political, social, and economic conditions shape and exert authority over the everyday urban, and the material and social effects of such dominations. The papers assembled here unite scholars from different disciplines, probing this infrastructural lens to understand the structuring effects of urban temporalities in relation to various topics, including urban mobility and transnational migration (Baumann 2019; Coman, Grubbauer, and König 2019), the politics of financializing urban infrastructure (Bond 2019; Grafe and Hilbrandt 2019), urban energy transitions (Elsner, Monstadt, and Raven 2019) and climate risk (Koslov 2019). In sum, these contributions advance three aims: to strengthen and enrich the analytical notion of infrastructure; to facilitate new knowledge about the construction of present, past and future temporalities; and to unveil potential starting points for social interventions that aim to develop alternative future conditions.

Time as social construct: the production and experience of temporalities

Time is curiously omnipresent although simultaneously invisible and yet taken for granted in much social and spatial research (Adam 1994, 503). Those literatures that explicitly engage with time mark a broad, fragmented, and interdisciplinary field of research that defies common definitions. Time has variously been conceptualized as an arrow, a cycle, or a rhythm, and as linear, coherent, or fragmented (e.g. Hägerstrand 1985; Crang 2001).

Without laboring the plethora of approaches and conflicting definitions that undergird studies of time (for a more comprehensive account, see Nowotny 1992), our approach underlines its social construction. Notably, this perspective shifts the focus away from clock-time, astronomical time, or other ideas of natural time, and towards what Nowotny (1992, 421) terms 'social time', as this is 'unique to human societies

or social systems'. Much research within the social sciences has long assumed time to be constructed and differentially experienced (Elias 1992; Giddens 1987; Nowotny 1992). Authors sharing these assumptions not only suggest that time is heterogeneous, they also point to the social, political, and economic systems that define conceptions of time (Barak 2013). In this sense, time is not merely the background against which everyday life takes place, but instead equally structures daily experiences and is structured through human practice.

Asserting the production of time inherently implies acknowledging the plurality of time or, in Nowotny's (1992, 424) terms, society's 'pluritemporalism'. This implies the simultaneity of natural and social time, as well as of different social temporalities and, concomitantly, the importance of accounting for different geographies of time (Barak 2013; Ogle 2013). In this Special Feature we speak of temporalities in the plural form to underline the diversity of temporal experiences, and the multiplicity of construction processes in and through which these experiences are embedded.

Temporalities are not only plural, they are also political and powerfully shape social inequalities. Understanding the ordering effects of temporalities requires considering both the power relations that shape the production of temporalities as well as the power effects produced through their ordering at different urban scales and in varying modalities. It is the spatial manifestation of such interplay that this Special Feature refers to when we speak of contemporary urban temporalities.

Our understanding of the power struggles that make up and result from these contemporary urban temporalities builds on extensive debates about the present temporal conjuncture. Post-colonial literatures have been pivotal in unearthing the global modalities of domination and the historical processes through which some temporalities come to dominate others (Bear 2014). Most prominently, Fabian (2002) and others

(Barak 2013; Ogle 2013) point to the domination of Western time over the rest of the globe. On the national level, the literature has shown how the state works to exert authority through temporal norms that are themselves imposed through the varying rhythms of political time, juridical time, or bureaucratic time at various scales (cf. Raco, Durrant, and Livingstone 2018). Consider, for instance, the ways in which state bureaucracies govern the temporalities of school life, unemployment compensation or voting rights: Clearly, their influence over citizen's temporal experience is ubiquitous. At a structural level, these accounts point to the domination of workers through the invention of clock or calendar time (Thompson 1967). At the level of the bureaucracy, authors depict how processes of waiting shape relations between the state and its citizens (Jeffrey 2010a; Brandon and Oldfield 2015). For Auyero (2010, 2012), the state makes people wait as a strategy of containment that turns citizens into patients. As Yiftachel (2009) notes, the state places unwanted populations in a condition of 'permanent temporariness'—a state of limbo that excludes people from the possibility of shaping their future (cf. Griffiths 2014).

With the decay of industrial capitalism, temporal norms have changed alongside the authority of the state in governing these temporalities. While modern states at the beginning of the 19th century attempted to synchronize time (Ogle 2013), subsequent technological progress and economic development have shifted temporal authority towards the hands of global capitalism. Its temporalities are, as Hope (2009, 64) notes, 'riven by temporal contradictions'. While global finance and corporate sectors urge for flexibility and change, they not only depend on the much slower cycles of production but also undermine the cyclical and longer-term temporalities of most governments (*ibid.*, 75).

The effects of these developments are highly contradictory. Accounts that assert the development of technologies, the networking of society, and the increase of

mobility frequently presume that late capitalism has accelerated urban life (Urry 2000). It is less acknowledged that these processes have also slowed down metropolitan life across the globe, for instance where residents become entangled in ever worsening traffic congestion, queue for basic necessities, and await communication technologies that have yet to arrive. What interests us here is providing analytical leverage to disentangle various temporalities and the ways in which they draw people together in unequal relations of power.

Time as infrastructure: an analytical concept

The temporal arrangements that define late capitalism are frequently illegible and the agencies that define them are difficult to analyze (Wajcman 2015). While an understanding of urban temporalities that is plural, heterogeneous, and sensible to the social construction of time is helpful to better grasp the complexity of the matter, we aim to go one step further in advancing an analysis of the temporal dimension of urban life. In the Special Feature, we suggest employing the concept of *infrastructure* to characterize contemporary temporalities. We hereby take inspiration from a growing literature in sociology, geography, and urban studies that engages with this notion to explore social organization and interaction.

First used in the 1920s, the term *infrastructure* refers to ‘the basic physical and organizational structures such as roads, power lines, and water mains needed for the material and organizational aspects of modernity’ (Gandy 2011, 58). More generally, *infrastructures* have been understood as enabling the flow of (tangible and intangible) goods and services (Edwards 2003) and allowing communication among strangers, thus facilitating the development of modern societies (Calhoun 1992). Research on *infrastructures* has explored both vertical and horizontal

spatial dimensions, as well as questions of accessibility, visibility, disruption, and spatial fragmentation (cf. Gandy 2011; Graham 2010; Graham and McFarlane 2015; Appel, Anand, and Gupta 2015) to explore the wider impacts of underlying material structures on modern societies. Moreover, the notion of *infrastructure* has been used to understand the structuring qualities of more abstract objects that share some of the characteristics traditionally ascribed to physical *infrastructures*; this literature also conceives of people (Simone 2004), political structures (McFarlane and Rutherford 2008), and specific kinds of knowledge (Bowker and Star 1999) as *infrastructures*.

Numerous properties that underline its value as an analytical tool can be ascribed to the notion of *infrastructure*: *infrastructures* variably enable and constrain urban practices. They can be used to foster connections and patterns, but they also divide and exclude others, for instance, those who do not have easy access to them. They establish path dependencies by binding inert resources to particular tracks of development; they act as interfaces or mediators by facilitating and shaping how we interact with our external environment and each other. While *infrastructures* constitute an asset, as they allow for ever more complex forms of social organization, they are also exposed to disruption and standstill. Finally, *infrastructures* create and maintain habits by establishing and reinforcing patterns of daily practices and processes (cf. Angelo and Calhoun 2013; Star and Ruhleder 1996). As an analytical concept, *infrastructure* therefore unveils that which lies underneath, and highlights how—as the structure upon which current forms of social organization and interaction rest—it powerfully shapes our social reality (Angelo and Calhoun 2013).

These crucial insights into the characteristics of *infrastructures* can also guide an inquiry into the production and experience of time. Our suggestion to conceptualize temporalities as *infrastructures* is not restrained to a metaphorical use of the term.

Instead, we argue that temporalities share the properties outlined in analytical approaches to infrastructure, so that transferring this knowledge to an understanding of temporalities allows for a more comprehensive and precise notion of their workings and effects. Approaching time through the notion of infrastructures allows us to outline how time not merely reflects, but also effects, enables, constrains, and preconfigures contemporary urban life. Moreover, in unveiling the making of these structures, the notion of infrastructures makes it possible to politicize hitherto hidden aspects of temporal domination: as an infrastructure, temporalities are constructed through social practices and their lasting effects. Temporalities are built upon one another to construct ever more complex structures that enable contemporary urban life. They enable and constrain, include or exclude, and produce or reproduce urban inequalities. Constantly being (re)produced through everyday practices, these practices can similarly alter these structures to cause lasting change. In advancing an infrastructural approach to the (re)production of urban temporalities, this Special Feature allows us to uncover the pervasive role of time in structuring contemporary forms of domination and explore alternatives and forms of resistance.

Infrastructures of time: workings, openings, and closures

The papers in this Special Feature draw on the notion of infrastructure in different and challenging ways that offer critical lessons for an analysis of contemporary urban temporalities. First, and most crucially, understanding temporalities through the notion of infrastructure enables us to unearth the temporal workings of inequality and forms of domination. Thereby this Special Feature follows in the tradition of tracing infrastructural networks to analyze forms of inequality (Graham and Simon 2008), and understand if and how the temporal opportunities of some

translate into constraints for others. In highlighting two modalities of temporal control, Hanna Baumann's paper in this Feature examines the consequences of Jerusalem's mobility regime for Palestinian residents: on the one hand, it is argued that the Eastern Jerusalem checkpoint system interrupts mobility and increases both social distance and uncertainty in Palestinian everyday life at the same time as it is used to construct Palestinians as 'irrational subjects'. On the other hand, the paper shows how the synchronization of Palestinian and Israeli public transport incorporates the former system into the latter, thereby 'linking and incorporating Palestinian movements into the everyday rhythms of the Israeli city' (Baumann 2019). Although contradictory, both forms of temporal practices constitute forms of control that according to Baumann actively advance Israeli policy aims.

The use of temporal strategies for ordering and domination, however, goes beyond the state. The temporalities of the economy, and particularly of finance, equally shape power relations. In several cases studied here, the complex and contradictory nexus between temporalities of the state and of the economy—particularly of finance—creates opportunities for 'temporal arbitrage' and other new dynamics of power. In analyzing the significance of piping systems for the formation of temporalities, Patrick Bond discusses the temporal implications of infrastructure investment in Durban, South Africa, building on David Harvey's (1981, 1982) notion of the spatio-temporal fix. While Bond aptly shows how investors—with assistance from the state—displace capital into infrastructure finance in the name of sustainability, the analysis outlines the impossibility of aligning the needs of socio-ecological survival with the profit-driven time horizons of investors. How this contradiction causes inequality becomes evident, for instance, in Bond's discussion of one of Africa's largest landfill sites, the Bisasar Road rubbish dump. Once imposed on one of Durban's poorest communities in

‘one of the world’s extreme cases of environmental racism’ (Bond 2019), this dump has now been turned into an investment opportunity for South Africa by using it to convert methane into electricity. Yet simultaneously this prolongs the existence of the dump and the suffering of the local community.

Second, an infrastructural analysis allows us to highlight the relationality of different places as they define temporality across these sites. Ruth Coman, Monika Grubbauer, and Jonas König (2019) explore the effects of longer-term patterns of outward labor migration in the town of Comănești, Romania, a city shaped by the temporal emigration of its residents. In analyzing how varying temporalities are constructed through the migrants’ ties with their hometown, the authors add a temporal dimension to an understanding of the interdependencies of arrival and departure cities. In this way, their infrastructural perspective allows them to show how Comănești’s temporality depends on temporal practices at other locations. The paper also outlines the everyday maintenance of these temporalities through numerous temporal practices, namely the conversion, acceleration, preponement, and condensation of time—practices that migrants employ to build, maintain, and upkeep temporal infrastructures. For instance, they depict how working abroad allows migrants to accelerate their life projects by using the wage difference between more and less peripheral sites.

Third, the analytic of infrastructure points to the material and technical devices that help to order temporalities: in analyzing the repercussions of Hurricane Sandy for New York City’s Staten Island, Liz Koslov inquires into the temporalities of managing climate risk. In particular, she details how citizen-individual expectations of the future intersect with state policies, and the insurance business in conflicts around flood mapping. Koslov’s ethnographic account thereby captures how these maps—as a particularly powerful technical device—present forms of claim making that not only determine spatial outcomes,

but also temporal ones. These range from the cost of insuring one’s home, on a more material level, to the production of uncertainty, on a temporal level, leaving Staten Island’s residents in a state of indeterminacy that people experience through a sense of limbo.

Fourth, all papers foster an analysis of the material effects of temporal infrastructures. This becomes most apparent in Elsner, Monstadt, and Raven’s paper on Rotterdam illustrating how the alignment of urban and infrastructural temporalities are central to the realization of low-carbon transitions in cities. The authors demonstrate that the temporalities ingrained in large-scale infrastructures create path dependencies that can hinder low-carbon transitions. Considering electricity systems, they show how aligning urban and infrastructure temporalities is a highly political process, involving negotiations between the energy providers, regulators and corporate and private users. Thereby temporal path dependencies of existing infrastructures favor centralized solutions in line with established temporal regimes that prove resistant to abrupt change. Therefore, incremental changes that strongly conform to existing power relations among the stakeholders prevail, preventing more sustainable flexible systems that would for instance be able to accommodate temporal preferences of citizens’ use of electricity.

Adding to an understanding of the material effects of infrastructures, Bond’s analysis shows how temporal financial norms in the shape of two infrastructural mega-projects. Similarly, the rhythms of the migrants’ transnational movements in Coman, Grubbauer, and König’s account leave their imprint on the city’s urban fabric in the shape of new and vacant houses waiting for the migrant’s return; the absence and presence of the city’s residents shaping the city’s ‘different faces’ (Elsner, Monstadt, and Raven 2019); or the frequency and social connotation of transportation services.

Finally, while most related research focuses predominantly on understanding and

unveiling power dynamics and inequalities, our infrastructural perspective on temporalities also allows us to point to openings and closures for social change. This way is led by a growing literature on provisional interventions that work within and against powerful systems of time, manifest, for instance, in deadlines, schedules and timeframes. In this journal, Sebreghondi (2012) speaks of material voids in processes of urban development, where reconstruction is suspended as a state in which the indeterminacy of the future offers possibilities for (temporal) appropriation. Similarly, for Jeffrey, ‘waiting may be the social soil in which progressive forms of politics can blossom’ (2010b, n.p.), while Thieme’s notion of ‘hustle’ (2013) or Brandon and Oldfield’s concept of ‘wait-hood’ (2015) point to improvisational forms of agency that evade some of the temporalities that dominate urban life.

This Special Feature’s editors and authors share that aim and argue that a more fine-grained account of progressive interventions first requires improving the legibility of the structures and practices that produce these temporalities. In operationalizing the analytic of infrastructure, the papers assembled here open up critical entry points to change the infrastructural dynamics of temporalities. Fritz Grafe and Hanna Hilbrandt explore the significant influence of mechanism of financialization on the temporalities of the urban. Their case study of the financialized production of a large-scale urban infrastructure project, London’s Thames Tideway Tunnel, illustrates how different temporal logics interact in the production of this sewer project. In jointly considering these different temporal dynamics, the paper outlines the ways in which mechanisms act together in polychronie, which Grafe and Hilbrandt understand as the plurality of temporalities interacting with moments of intersection and conflict. Financial interests were dominant in defining the time horizon of the project, disregarding considerations of the future beyond the logic of financial calculus. Furthermore, the paper outlines how

intersecting temporal dynamics provide windows for interventions, for example when electoral cycles coincide with times of financial turmoil.

Thinking through the making of temporal infrastructures—that is, disentangling temporal authorities and their underlying power structures—consequently allows thinking through opportunities for action and political change. We hope that this Special Feature inspires further research along these lines that may help to define possibilities of practical intervention and political activism acting to reclaim time.

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