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The Cloud, the Crowd, and the City: How New Data Practices Reconfigure Urban Governance?

The cloud, the crowd, and the city: How new data practices reconfigure urban governance?

Philip Ashton[1], Rachel Weber[1] and Matthew Zook[2]

The urban archetype of the flâneur, so central to the concept of modernity, can now experience the city in ways unimaginable one hundred years ago. Strolling around Paris, the contemporary flâneur might stop to post pictures of her discoveries on Instagram, simultaneously identifying points of interest to the rest of her social network and broadcasting her location (perhaps unknowingly). The café she visits might be in the middle of a fundraising campaign through a crowd-funding site such as Kickstarter, and she might be invited to tweet to her followers in exchange for a discount on her *pain au chocolate*. As she ambles about Paris, the route of her stroll is captured by movement sensors positioned on top of street lights, and this data—aggregated with that of thousands of other pedestrians—could be used by the City of Paris to sync up transit schedules. And if those schedules were not convenient, she might tap Uber to whisk her home to her threadbare pension booked on AirBnB.

This vignette attests to the transformation of the urban experience through technology-enabled platforms that allow for the quick mobilization and exchange of information, public services, surplus capacity, entrepreneurial energy, and money. However, these changes have implicated more than just consumers, as multiple technologies have been taken up in urban governance processes through platforms variously labeled as Big Data, crowd sourcing, or the sharing economy. These systems combine inexpensive data collection and cloud-based storage, distributed social networks, geotagged locational sensing, mobile access (often through "app" platforms), and new collaborative entrepreneurship models to radically alter how the needs of urban residents are identified and how services are delivered and consumed in so-called "smart cities" (Townsend, 2013). Backed by Big Data, smart city initiatives have made inroads into urban service provision and policy in areas such as e-government and

transparency, new forms of public-private partnerships through "urban lab" arrangements, or models such as impact investing, civic hacking, or tactical urbanism (cf. Karvonen and van Heur, 2014; Kitchin, 2014; Swyngedouw, 2005).

In the rhetoric used by their boosters, the vision and practice of these technologies "disrupts" existing markets by harnessing the power of "the crowd"—a process fully evident in sectors such as taxi (Uber/Lyft), hoteling (AirBnB), and finance (peer-to-peer lending). However, the notion of disruption has also targeted government bureaucracies and public services, with new initiatives seeking to insert crowd mechanisms or characteristics—at once self-organizing and collectively rational (Brabham, 2008)—into public policy. These mechanisms envision reconfiguring the traditional relationship of public powers with planning and governance by vesting data collection and problem-solving in crowd-like institutional arrangements that are partially or wholly outside the purview of government agencies. While scholars are used to talking about "governance beyond-the-state" (Swyngedouw, 2005) in terms of privatization and a growing scope for civil society organizations, technological intermediation potentially changes the scale and techniques of governance as well as its relationship to sovereign authority.

For instance, civic crowdfunding models have emerged as new means of organizing public service provision and funding community economic development by embracing both market-like bidding

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mechanisms and social-network technologies to distribute responsibility for planning and financing socially desirable investments to laypeople (Brickstarter, 2012; Correia de Freitas and Amado, 2013; Langley and Leyshon, 2016). Other practices are even more radical in their scope. Toronto's Urban Repair Squad—an offshoot of the aptly named Critical Mass bike happenings—urges residents to take transportation planning into their own hands and paint their own bike lanes. Their motto: "They say city is broke. We fix. No charge." (All that is missing is the snarky "you're welcome" at the end.)

Combined, these emerging platforms and practices are challenging the tactics, capabilities, and authorizations employed to define and govern urban problems. This special theme of *Big Data & Society* picks up these issues, interrogating the emergence of digital platforms and smart city initiatives that rely on both the crowd and the cloud (new on-demand, internet-based technologies that store and process data) to generate and fold Big Data into urban governance. The papers contained herein were presented as part of a one-day symposium held at the University of Illinois at Chicago (UIC) in April 2015 and sponsored by UIC's Department of Urban Planning and Policy. Setting aside the tired narratives of individual genius and unstoppable technological progress, workshop participants sought to understand why these practices and platforms have recently gained popularity and what their implementation might mean for cities. Papers addressed numerous questions: How have institutional supports and political-economic contexts facilitated the ascendance of "crowd" and "cloud" models within different spheres of urban governance? How do their advocates position them relative to imaginaries of state or market failure/dysfunction? What kinds of assumptions and expectations are embedded in the design and operation of these platforms and practices? What kinds of institutional reconfigurations have been spurred by the push to adopt smart city initiatives? How is information collected through these initiatives being used to advance particular policy agendas? Who is likely to benefit from them?

Such conversations are necessary because these urban Big Data practices raise many concerns and contradictions. Among these are a set of new privacy issues posed by Big Data collection (crowd-sourced and otherwise) where quotidian urban practices—as mundane as simply moving freely through public space—become transformed into "data" with specific commercial and surveillance applications (Amoore, 2013; Monahan and Mokos, 2013). More submerged but no less important are the ways in which Big Data's ontological and calculative practices alter the very definition and analysis of complex urban problems and therefore the requisite policy interventions

(Couldry and Powell, 2014; Kitchin, 2014; Mattern, 2013). In contrast to practitioners' emphasis on smart city practices being "just tools" to better solve urban problems, the four papers in this special theme share a concern with the forms of urban knowledge produced by these practices and their algorithms, and the way they make events, places, and people legible and actionable through technology. Correspondingly, the papers all seek to unpack administrators' enchantment with new technologies and their algorithms to surface the assumptions underlying such practices—assumptions, for example, that privilege individual behavior over collective action.

When reading these articles, we propose three sets of theoretical antecedents to help frame the discussion of Big Data and urban governance. First, despite the relative novelty of smart city discourses, in practice they build off a scaffolding of calculation and quantification that connects to longstanding epistemologies of positivist social inquiry or representation. Even as Big Data advocates portray it as a significant break from (and improvement on) earlier practices of urban management, there is a genealogy that can be traced from the linear regression models used to justify urban policy in the 1960s, or even from simpler practices of categorization like broken windows policing. This is not to suggest that Big Data is "nothing new under the sun," but rather that Big Data's emergence within urban governance needs to be situated (and differentiated) relative to other modes of inquiry. Here, one of the subtexts to be taken from the assembled papers is that, unlike positivist approaches, Big Data modes of analysis draw their authority differently than do positivist modes—it is the very dispersion of different data streams that enables algorithms to draw actionable patterns out of completely disconnected, disembedded, or fluid social realms (Amoore, 2016).

Second, although the term "crowdsourcing" originated in 2006, the idea that public policy works in or through crowds is not a new phenomenon. Indeed, the techno-futurists of today who celebrate the wisdom of the crowd may be surprised how seldom crowds are conceived of as a solution to the challenges of modern society rather than an object in need of management. Writing during the upheavals of war in Europe, scholars like Gabriel Tarde and Elias Cannetti saw crowds as simultaneously offering the possibility of equality while at the same time being unstable mobs prone to influence by demagogues and groupthink (Brighenti, 2010). At the same time, American pragmatists such as John Dewey analyzed liberal democracy and its problem-solving capacities through the lens of diffuse social formations known as "publics"—groups of citizens that are "[called]... into existence having a common interest in controlling [the] consequences" of different policy actions (Dewey,

1927: 126). Thus, we argue that a first key step in analyzing urban Big Data and smart cities is the recognition of the different kinds of crowds implicated in the use of these platforms—interrogating how they form, their composition, the mechanisms through which they act, and the extent to which they reproduce or ameliorate larger societal dynamics.

Third, any critical account of smart city practices must necessarily draw connections to larger transformations in capitalism that privilege information generation and capture as essential modes of profit-making. In the theoretical accounts of "cognitive capitalism" and the "attention economy" offered by Marazzi (2008) or Terranova (2012), the economic and fiscal crisis of the 1970s not only produced the fragmentation and precaritization of labor, but also shifted the boundaries of value creation beyond the factory to privilege unpaid cognitive labor. Big Data and sharing economy platforms (and their allied financial apparatuses of venture capital and IPOs) have emerged as novel business models in this context, seeking to transform captured streams of "volunteered" movements and activities (casual swipes on the phone, clicks on a "Like" button, or strolls through the streets of Paris) into intellectual property that can be capitalized. Many smart city practices thus rely not only on cheap (interns monitoring Twitter feeds) or contingent labor (Uber drivers hustling to earn a living wage in the "sharing" economy), but also on enabling the free data and "content" under the guise of the "creative economy" (Peck, 2005).

Accordingly, the design and emergence of Big Data platforms cannot be seen as a straightforward process of technological innovation overcoming problems plaguing urban society. Instead, as the articles in the special issue stress, the technologies themselves emerge and interact with their environments in ways that are fully inscribed with the politics of their designers. Whether examining the socio-technological interactions that occur through a gunshot detection system used by the city of Camden, New Jersey or a vacant land mapping program in Louisville, Kentucky, the papers push us to attend to the contexts for their design and adoption and, further, the ways platforms format the very environments in which users operate. They also push us to consider, following Langdon Winner (1980), the degree to which these new artifacts have their own ingrained politics and prove malleable for purposes different than their designer's intent.

The four articles in this special theme take different slices on these questions.

Robert Lake's analysis reviews the ontology and politics of Big Data practices beginning with the recognition that issues of definition and politics are fundamental to data collection in cities. Classifications vary such that what counts as a shooting in New York City differs from how nearby Camden, New Jersey registers the number of gunshots that occur, distinctions based both on technological capabilities as well as local political considerations. From this foundation, he focuses his paper on the concern that Big Data suffers not only from the politicization of practice, but from its foundational ontological premise of "hyper-individualism"—i.e., or treating persons, events and phenomenon within a city as independent units unconnected to each other or to any larger context. This understanding of how the world should be understood (and thus converted into data) is fundamental to Big Data practices and challenging such ontologies "destabilizes the entire edifice of practice built up on the prior underlying foundation" (p. 7). As a result of this conceptualization, Lake argues that Big Data governance is reduced to a concern of how to best manage the atomistic behavior of individuals and ignores the complexity and relationality of urban processes, particularly the ability for citizens to engage in collective resistance.

Similarly, John West's research focuses on the abstracting logics of Big Data. He discusses the specific case of a large public school in the Bronx and how Big Data systems, implemented with the laudable goal of increasing transparency, instead resulted in what he terms new "opacities." These opacities included technical problems with measuring student and teacher performance and improvement, the loss of the classroom knowledge that could be provided by educators, and the strategic use of exemptions to indemnify smaller charter schools from measurement. These opacities allowed for the tactical manipulation of the data to obscure larger structural changes by the Department of Education, such as the creaming of high-performing students by charter schools and the resulting overcrowding and concentration of hard-to-serve students in larger schools. West argues that the production of data for evaluation purposes must also be understood as productive in a larger sense beyond the appraisal of a single student. By opening new scales of analysis for comparison and benchmarking—the teacher, the classroom, the school—this Big Data exercise transferred knowledge and power from classroom and principals to central city administrators, facilitating systemic reorganization to the detriment of the quality of this particular high school. While these evaluative systems ostensibly increase accountability for parents, West argues that administrators should "more fully invite the evaluated into the process of defining the terms of evaluation" to "promote multi-directional accountability, rather than a one-way mirror" (p. 30).

Taylor Shelton's article draws on the concept of "performativity" to argue that the sources of Big Data are changing the way decision makers are conceptualizing the city, resulting in changes to the types of

policies and interventions that are planned. He critiques the "new urban science" that seeks to borrow methods drawn from the natural sciences and apply them to urban geography and planning. Such a borrowing ensures that quantitative analysis is the only correct approach, resulting in an ontological definition of the city reduced to whatever is most easily counted—i.e., "little more than a mass of population" (p. 11). Such conceptualization leads to overly broad generalizations of universal laws that are arguably not supported by empirics and that break-down when different scales of the urban and uneven patterns within cities are considered. A second example draws upon an application of data-driven practice in Louisville focused on mapping vacant properties. This practice, argues Shelton, hardly lives up to its disruptive potential to create new understandings of places but instead reinforces existing (and politically defined) imaginaries of problem areas. Both these examples show how when cities self-consciously adopt Big Data practices, they valorize technical expertise while issues of injustice or local concerns are rendered less important. However, Shelton also argues that because that Big Data need not be limited to a single understanding of the urban, that it potentially enables "more democratic and egalitarian ways of actually producing the urban as we know and experience it." (p. 26)

Matthew Zook first reviews the genealogy of key ideas within smart city governance, such as the belief that society's problems are solvable as long as sufficient data is collected and analyzed. While sympathetic to the application of data to urban problems and policies, he notes that it is equally important to understand the motivations and ideologies that guide the problem-solving from the start. The historical precursors to today's smart cities—Howard's Garden Cities, Geddes' Camera Obscura, and Allende's Project Cybersyn—were all generated by motivations for social justice and progressive socio-economic reform that differ quite markedly from the goals emerging from today's technology and neoliberal rhetoric. Recognizing the promise of Big Data for urban governance, he also cautions that "metrics don't simply measure; in the process of deciding what is important and possible to measure, these data are simultaneously defining what cities are" (p. 15).

As a collection, these papers offer insights into how future research into smart city initiatives might examine the nexus of Big Data and urban governance. Their contributions can be read as both methodological and political. By combining close attention to the work of socio-technical systems of measurement with institutional ethnographies or studies of policy-making controversies, the papers show how data is enmeshed in the dynamics of austerity, privatization, or neoliberal urbanism more generally. Here, smart city initiatives might be read as institutional practices of control, rooted in attempts to produce an actionable future out of a chaotic and ever-changing present. Whereas this necessarily highlights how data systems strip urban problems out of their context to make them actionable for policymakers—a point reinforced by all the papers—it also shows Big Data's highly-productive role in animating the thick relational entities known as institutions. Whether we're looking at the apparatuses of urban security or the role of data analytics in restructuring public school systems, the hyper-individualism of measurement (as noted in Lake's paper) is but one moment in a rich process of institutional transformation.

At the same time, the authors engage directly with the evolving debates around the politics of these new data practices. On the one hand, the emergence of smart city initiatives—often led by opaque alliances between large corporations, state agencies, and philanthropic organizations—has the potential to reinforce strategic biases towards commercial or surveillance applications of new technologies. As the algorithms they mobilize purport to objectively represent social realities, they remove political questions from the public sphere and increase the gulf between citizens and decision-makers. In this sense, there is potentially a strong "post-political" dimension to smart city initiatives (Swyngedouw, 2009). Notwithstanding these critiques, the authors also surface numerous examples where data-driven practices and modes of analysis are used against the same institutions that design and promote them. This suggests, at the very least, that the politics of smart city initiatives are more open-ended than they may seem, and that they could portend certain positive freedoms—to make decisions more democratically, to engage in collective learning, to inspire creativity—that can be welcomed as challenges to calcified procedures and captured regulatory agents. The task ahead, it seems, is to develop a vocabulary capable of parsing and differentiating the rhetoric, ideology, practice, and critique of crowd-based platforms for urban Big Data and elaborating how they might be improved or challenged.

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