Data Ethics in Practice: Rethinking Scale, Trust, and Autonomy

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Introduction

Relentless unfolding of surveillance architectures and an embedding of data exploitation into the foundations of capitalism suggest that data ethics are urgent and necessary. Frequently, however, data ethics refers to or resolves into vague statements of principles by powerful entities: Google's publication of an ethics charter in 2018 and its launch of an Advanced Technology External Advisory Council (ATEAC) – popularly known as the 'ethics board' – in 2019 which lasted only a week before being abandoned (Walker, 2019) are just two examples. Equally, data ethics can refer to design requirements that are presented as an idealized aim for designers of data-based technologies. These include requirements proceeding from regulatory frameworks such as the European Union's General Data Protection Regulation (GDPR) or similar legislation in place in other countries. In this mode, data ethics are often associated with rules that must be followed or consequences that must be managed (Powell et al, 2022). Within this framing, data ethics is often displaced. This displacement can occur temporally, as when adherence to ethical principles is pushed later in time until after a data collection process is completed, or functionally, as when data ethics are perceived as issues of compliance (Powell et al, 2022). As a counterpoint, some researchers are beginning to consider ethics as part of social practice, shifting from discussions of ideal ethical principles that should be addressed in technology design towards discussions of specific contexts and practices (Møller et al, 2020).

Ethics as practice in data-driven contexts refers to ways of organizing, acting with, relating to, or contesting data. The use of data within urban settings provides a number of specific contexts and practices, intersecting

and transcending what might be considered 'top-down' or 'bottom-up' dynamics. Data-based governance, management, and civic engagement are deeply embedded into the function and experience of cities, as the other chapters in this book illustrate. This embedding raises important questions of ethics, justice, and power. Regulatory responses, such as data protection legislation and limits on data collection, address some of the most obvious power differentials but cannot necessarily address issues of systemic injustice. This is often because, in contrast to well-specified issues of regulatory compliance, issues of justice are temporally dispersed and contextually specific. This means that 'bottom-up' data ethics practices are embedded within techno-systemic frames maintained through state and corporate narratives, investment, and policy support (Powell, 2021). This does not mean that bottom-up ethical practice is impossible, or only legitimate if it offers straightforward, effective resistance to 'top-down' dynamics. Rather, it suggests that such practice might be most effective when it acknowledges and operates in relation to techno-systemic frames. This means looking at how data-based structures create and maintain unequal power relations, as well as how attempts to intervene in these relations, generate new potential for change as well as new complexities. This approach resists the urge to frame attempts to escape a data-driven universe as ideal ethical positions, and instead attends to the tensions that inevitably emerge in the ways that alternatives to surveillance, extractivism, exploitation, and data profiteering are designed. Through attention to these tensions, new possibilities can sometimes become apparent. Therefore, in this chapter, data ethics is understood as a range of practices that attempt to address issues of justice and consequence related to the design and operation of data-based systems.

This chapter outlines a range of possibilities for understanding issues of data justice from the perspective of ethics as a practice. The practices include commercial practices, which sometimes show the limits of existing regulatory frames, as well as participatory processes like data walking, which can be used as an alternative to standard processes of consultation in urban planning, and the creation of collective models of reflection on the use of specific data – sometimes called neighbourhood ethics committees. These practices model different kinds of engagements with knowledge, data, and with different dynamics of resistance, resilience, and community strength. This makes these practices useful and important ways of understanding the complex dynamics that make up the ethical terrain of smart cities, which I define as urban realms managed at scale with conflicting strands of data and negotiated through a range of knowledge. The chapter therefore reflects on how the processes of trust and autonomy modelled through such practices of ethics might connect with other considerations that apply at different scales.

A reflection on practice and scale is especially important in a context of uncertainty or 'perpetual crisis'. Many aspects of the current ongoing

crisis are experienced at small or lived experiential scales through bodily perception, while only being able to be experienced at a global or distributed scale through data and narratives based on data. Thus the climate crisis, which differentially impacts individual bodies located differentially in space, as well as crises of health, institutional resilience, and inequality. This illustrates the paradoxical connections between data and ethical practice: while some aspects of lived experience escape complete datafication, other features of lived experience, including important shared experiences such as the planetary experience of climate change, are intensely datafied. Therefore, ethics as practice, especially in smart city contexts, needs to cut across and connect different scales and aspects of datafication. There is no singular 'data ethics' – nor can data ethics merely reject datafication.

Conflicts of scale and urban smartness

As Cinnamon points out in this volume (Chapter 10), cities become datafied in part through appeals to scale. A combination of the capacity for quantification and the desire to manage large-scale, often complex systems has meant that smart urbanism operates through a scalar politics. This is similar to the way that other technological politics were positioned in the past, including claims that the expansion of the internet separated a purported 'global flow' away from an experience of 'local place' (Castells, 2020). This scalar distinction, where the small-scale and the large-scale are both separated and differently positioned in relation to technological capacity, continues. In relation to datafication and smart urbanism, 'small-scale' projects often assume legitimacy based on an assumption that context is easier to understand at a small scale, by drawing on qualitative rather than quantitative data, or identifying how expanding scales can cause harm by removing context, flattening difference, or intensifying inequalities by embedding biases in large-scale data systems. Creating oppositions between scales and linking these oppositions to competing interpretations of data allows these tensions to become the motor of contentious urban politics, as Cinnamon discusses. At a citywide scale, the assumption that broad-scale data contributes straightforwardly to optimization of urban service delivery (such as traffic management or allocation of assumedly scarce resources) reiterates a 'techno-systemic frame' (Powell, 2021) that foregrounds quantitative data production and analysis as the best way to understand urban life. Such a frame is not inevitably connected with large-scale data politics: grassroots actors also operate within these frames, shifting their civic actions towards engagement with data in order to bolster their legitimacy. What results is often friction and tension: conflict regarding both the meaning of data and also its reliability, validity, and appropriateness as a technique for gaining civic voice.

Therefore, issues of scale intersect with broader dynamics of datafication within smart cities, resulting in frictions at, within, and between scales. This dynamic complicates efforts to oppose, transcend, or transform urban spatiality through recourse to data either as material or as a discourse embedded within techno-systemic frames. Redress of these frictions and the broader injustices or inequalities they reflect becomes an ethical imperative. This is the space occupied by forms of data activism, which can both attend to and leverage fictions in either reactive or proactive modes (Milan and van der Velden, 2016). Data activism can be one form of ethical practice in relation to data, and like other ethical practices, can unfold at and across different scales. Data activism is also constrained by techno-systemic frames, encouraging citizens to present their concerns using data or data-based arguments. This can contribute to the failure of purportedly 'ethical' projects to address systemic issues.

Data ethics, regulation, and practice

Within policy and regulatory spaces, the phrase 'data ethics' has already been captured by powerful actors who use it to suggest the legitimacy of their existing business models and to disavow the necessity to develop or abide by laws or regulations. The establishment of ethics committees within monopoly capitalist data firms and the production of ethical codes of conduct are examples of this performative 'data ethics'. In response, scholars and practitioners are increasingly turning towards an examination of ethics as practice, that encompasses actions such as organizing using data or contesting data meaning and power. Ethics as practice also focuses on what is done, rather than what is said. In an age of perpetual crisis, it is actions that shape the space of engagement, and both powerful and less powerful actors do things that run counter to, or open different space from, what is declared. In other words, in crisis, plans give way to situated actions (see Suchman, 2007). Responsiveness, in a crisis state, may mean ignoring or bypassing the regulatory frameworks that are often indicated as the foundations on which ethical action might be taken. Equally, it may also involve actions that create new or unexpected ways of understanding or acting with data.

For example, regulations already govern many aspects of data collection, use, and processing at large scale. These include wide-scale regulations like the GDPR which applies across the European Union and which also influences policy in the UK, as well as data processing and procurement rules, which apply in specific sectors. Regulatory frameworks, ideally, form the foundation for actions or practices that address substantive issues of justice and equality. They also, however, act as terrains of struggle where issues of trust, autonomy, and context are brought into focus.

In this chapter, examples of data ethics in practice that operate at different scales provide an indication of how practices of data ethics unfold within the UK's peculiar form of perpetual crisis (featuring a lax and inequitable response to COVID-19, Brexit, a weak regulatory environment, intense and racialized inequality, and a political incapacity to address climate change). At the national scale, regulatory gaps created by COVID-19 emergency legislation have reopened questions about the collective value of data, the potential or limits of trust in different kinds of institutions, the role of civil society organizations in performing data activism, and the limited potential to shift data governance frameworks. At a hyper-local scale, similar issues of trust, autonomy, and context emerge around the potential to create local groups of citizens tasked with creating data management strategies that align with local conceptions of value, fairness, and justice. Between these two scales lies the potential to investigate ethics as practice as a means to surface other forms of knowledge and care that might be necessary for a flourishing existence in a state of perpetual crisis. These practices might include research practices like data walking, or experiments in creating multiscalar relational structures that allow for dynamics of mutual aid and support to proliferate.

Large-scale (un)ethical practices

Through the early stages of the COVID-19 pandemic, the back-end delivery of health care in the UK became quietly intermediated by companies invested in using AI technologies to dynamically manage health care resources. In April 2020, regular procurement rules that would usually have been in force to regulate the process for awarding tender contracts for government services were suspended under emergency legislation passed in order to deliver personal protective equipment (PPE) that was in short supply in the UK. Palantir, a US-based data management company whose previous core business included managing data for the United States intelligence services and for its Immigration and Customs Enforcement system, won a contract to manage data during the pandemic. This bid was awarded at an artificially low cost, suggesting that Palantir was seeking to make its systems part of the UK health infrastructure. In 2021 Palantir was removed from a UK government health and social care contract after public outcry, facilitated in part by civil society organization Foxglove, which pointed out that Palantir's move from US-based intelligence technologies to UK health systems was facilitated at least in part by the suspension of the UK government's public procurement rules during the COVID-19 pandemic and the sense of a latent and unrealized benefit of health data. In 2022, Palantir submitted a bid to take responsibility for end-to-end management of the UK's health infrastructure, which Foxglove continues to oppose.

Foxglove's actions identify ethical conflicts unfolding at very broad scale, drawing attention to regulatory gaps and also to the fact that the creation of a national-level health service and associated data infrastructure have generated a collective store of beneficial data which can be managed in a number of different ways. The possibility for health data to become a store of shared value and benefit contrasts with the techno-systemic frame that positions it as input data for resourcing and policing algorithms that might be sold on in other contexts. Cori Crider of Foxglove writes, 'If the future of UK health and social care depends on better data, a sustainable system needs to build up our own data science expertise, and not put us in hock to expensive consultants and tech firms' (Crider, 2021). Foxglove's opposition to Palantir's role in the NHS identifies how processing and managing this extremely broad-scale data has long-term benefit for the processor, and also the fact that existing regulatory frameworks do not make adequate provision for the loss of collective value to the UK as a whole when this data is moved away. Foxglove's assessments of the risks to the UK mirror some earlier data activism regarding health data, which appeared as opposition, in 2011, to a data-sharing agreement called Care.data, which made it much easier to share patient data between hospitals and family doctors, but which also would have opened this data to reuse by private insurance companies (Carter et al, 2015).

The quiet and systemic intervention by Palantir raises some questions about the ethics of AI in health delivery and health resource management, as well as broader questions regarding the ethical practices at work in the programming, marketing, and global reach of data-based systems. Palantir's resourcing systems, for example, will have been trained on healthcare data from the United States, set in a context of extreme health inequality, where poor and minoritized communities lack effective access to healthcare, meaning that systems (trained with the data that is available) effectively fail to include these communities. This is one of two types of bias associated with these kinds of data-driven systems: the bias of exclusion. The other type of bias, the bias of inclusion, results from the ways that assumptions about minoritized communities are 'programmed in' to such systems, leading to the continuation of racist or discriminatory practices; for example, in relation to chronic conditions such as diabetes that can be exacerbated by poverty or inequality. In addition, in a public system like the UK's health system, is it right for the insights from these data to accrue to a private entity like Palantir? Here we encounter a problem of data governance and collective management of data. These data are valuable – UK health data is particularly valuable – and they are public assets through a certain definition. There is strong public support for retaining the value of this data, which could, with the right kind of political or economic argument, be leveraged as a form of collective benefit.

There is also another aspect of scale and autonomy that emerges in the case of Palantir and the NHS data, which connects more strongly with the ways that scale, data, and autonomy are positioned in smart cities. This has to do with the way that the management of data, including the way that it is processed, managed, and placed into dashboards, establishes the power of the intermediary. In UK smart cities, data processing contracts and dashboarding services are often also awarded to multinational corporations such as Siemens, which facilitates many location-based sensing systems (Siemens, 2020). With access to large-scale data like NHS medical data or smart-city mobility data, data processing intermediaries like Palantir or Siemens construct dashboards, which can then be marketed back to clients like cities as the main means to understand broad-scale phenomena. What's at stake in a dashboard-driven world are the specific ways that dashboards create and represent the truth. Scholar of dashboards and their histories Nate Tkacz writes, 'Dashboards condense data for easy digestion, which can obscure a user's knowledge of how trustworthy or accurate that data is. By presenting often very complex, messy and varied data in simplified forms for consumption via a dashboard, sometimes subtle changes take place in how that data is understood' (Bartlett and Tkacz, 2017). The power to shape that data lies with the creator of the dashboard, who sets the terms through which certain things are defined or processed as data, as well as the way that data are standardized, codified, and managed over the long term.

Trust and autonomy at and across scale

These questions of scale and power reinforce the idea that trust is undermined and autonomy is eroded when data-based decisions are taken at a broad scale, meaning that protection of individual rights needs to be delegated to regulatory frameworks. However, as illustrated by the Palantir case, even existing regulatory frameworks may be suspended or not correctly applied, which may be one reason why trust in data-based systems has become more fragile. However, large-scale data processing, especially of complex urban data like mobility data, can also reveal complex, localized patterns, incongruities, and complexities. Batty (2022) identifies the need to interpret and understand this data using principles of relationality, marking a shift away from assuming that large-scale data generate highly generalized insights. Batty's team created speculative models of different kinds of mobility patterns that might be predicted for a post-pandemic lockdown London based on different combinations of choices, such as working at home, working in an office, or prioritizing different forms of transit. The simulations of different scenarios for 'post-lockdown' urbanism were more specifically various than the authors had anticipated. This suggests that the techno-systemic frame foregrounding computable and dashboardable data's seamlessness and consistency may embed more frictions than expected. Batty's revision of the kinds of insights generated

from large-scale data suggests that autonomy and relationship complicate predictions made using large-scale data sets. Therefore, the practices of dashboarding and predictive data analysis create and maintain dynamics where individual behaviour is observable and interpretable by corporations whose responsibilities to individuals and citizens may be limited, ignored, or unable to be fully considered. This creates tensions that are difficult to investigate, in part because they cut across and between scales.

Taking forward this realization of complexity and friction even within 'broad-scale' data collection reiterates the importance of regulatory protections. It also indicates that deeper understandings are needed of how people understand what aspects of their lives are rendered into 'large-scale' data and what significance this might have. These ethical questions are, once again, framed or described in relation to scale, where 'smaller-scale' frames of assessment suggest the capacity for attention to qualitative, rather than quantitative or AI-processed aspects of data. However, scalar oppositions don't always map straightforwardly to questions of interpretation. What might be more valuable than celebrating the 'small scale' for its own sake could be the foregrounding of experience and complexity, which is also in evidence in Batty's re-examination of large-scale data.

Small-scale interventions and shifts in practice create opportunities to reveal, unfold, and contest the dynamic of data-based smart urbanism that Kitchin (Chapter 2, this volume) describes, whereby dynamics of capitalist extraction intensify the power of commercial companies within urban governance processes. As Cohen (2019) points out and Kitchin (Chapter 2) develops, the dynamics that result from this consolidation of economic power, data extraction capacities, and control of governance processes by aligning them with data-driven decision making, changes the expectations and performances of citizenship (Powell, 2021).

Many civic actions are now undertaken by, through, and in relation to the data-driven dynamics that characterize the smart city. These can include active modes of data citizenship such as data audits of open government data, and civic projects such as environmental sensing, map-making, or 'bottom-up' data advocacy (Couldry and Powell, 2014; Gabrys, 2016). They can also include socio-technical efforts that are less explicitly technology-driven, including efforts to shape and reframe how different kinds of knowledge might connect, or contest, digital data. This socio-technical version of 'data friction' highlights how urban data power is neither a matter of total domination through commodification and surveillance dynamics, nor is it a matter only of opposition through resistant data power. Instead, the qualities of social friction and tension that emerge around the practices of data collection, the definitions of which knowledge is valuable and important in relation to this data, and the storage, sharing, management, and brokerage of this data create the conditions for emerging forms of solidarity.

Reconfiguring the value of data and creating new solidarities

For example, frictions concerning the quality and use of sensor data intended to facilitate community-based reflection, decision-making and communication between a neighbourhood where poor quality accommodation suffered from damp emerged when the community of Knowle West in Bristol undertook a pilot study using community-collected sensor data (Balestrini et al, 2017). The repository of this data was intended to become a 'commons' for use among a community comprised of social housing residents, tenants in privately-owned buildings, small business owners interested in potentially creating businesses around the collection of data about building conditions, and the local government, whose austerity-driven cost-cutting resulted in the firing of the inspector who previously judged the difference between damp and humidity. These multiple groups each had different ideas of how and in which way to interpret and use sensor data, especially in a context where there were asymmetries in terms of the ability to make data make money, secure power, or change institutional knowledge. The frictions and tensions that emerged around the data commons produced a form of solidarity between technical experts, community leaders, and residents in poor quality housing that allowed them to identify the gaps in knowledge, expertise, and action. The frictions necessitated a practice of solidarity, grounded in a shared recognition of the gaps in capacity at the government level.

These gaps in capacity have led to considerations of how to embed data into work that strengthens the capacity of different kinds of organizations, including informal organizations, to support public services and, more importantly, the public. The UK's Ratio Research conducts research in partnership with public services and community support organizations investigating connection, trust, and belonging as a foundation for public services and civil society capacity. Michael Little describes this as 'relational social policy' (Little, 2021). One of Ratio's long-term research endeavours has been to create opportunities for connection, trust, and belonging to develop by setting up collective contexts where resources, including data, are shared and employed for mutual benefit. One of these contexts is the 'data club', a version of a mutual aid group that reflects on the potential to use data to enhance trust and connection.

Data clubs and local ethics boards

In Glasgow, Rotterdam, Birmingham, and London, small groups have formed based on principles of mutual aid. In Glasgow, groups of women are supported to begin saving money together. Through the process of making small loans and saving together, the women create relationships of

trust and reciprocity, able to talk about their struggles and share strategies in response. The groups have also begun to experiment with sharing data collected from wearables and apps, using these data to create conversations and provide structures that allow the women to feel safe with one another. One of the features of sharing data in these contexts is to unseat feelings of shame that result from individuals internalizing high levels of stress and operating without strong relationships of mutual support. Creating these 'data clubs' lets women read their data in relation to others', setting up emotional norms within the group that support the capacity to discuss difficulties – which could even appear 'within the data' as divergences or outliers. Data clubs allow their participants to define or redefine the shared values they might hold and what their data might mean for them. The practices within data clubs currently include sharing, discussing, and comparing, although it is possible that defining shared value might also include defining the conditions under which data might be shared or sold, including where any resulting benefit might accrue. The data clubs show the potential for community power to enfold data practices into other efforts to establish and maintain relationships of trust and reciprocity. Yet community institutions can also provide capacity for extending the mutual aid principles of data clubs beyond a small group, at the same time modelling different interscalar dynamics for supporting dynamics of mutual aid.

   One of the communities is in Walworth, south London, a neighbourhood of 40,000 people where 83% of the population is in the most deprived quintile nationally and where 52% of the population is of Black or minority ethnic background. I have joined Ratio Research as a community-based researcher exploring what data East Walworth residents think is important, what they would like more data about, and what questions their community could answer with data, in preparation for creating a set of data clubs in the local area. In Walworth there could be up to 15 data clubs of 20 people each. Data club members would receive £70 per year into the club bank account, be expected to keep in touch by WhatsApp, save between £1 and £5 per week in the club bank account, and collect data on community and health. A club member would also be expected to meet every two weeks with the members to reflect on what their data mean for the group and the broader community, and to make loans to other club members. The structure and practices of the clubs draw direct inspiration from other mutual aid structures, particularly the trust and safety net created through the provision of small loans.

   To link together the Walworth data clubs and to help to consider how data might create new relationships of trust locally, beyond the small scale of the individual groups, the clubs will be supported by a neighbourhood ethics committee. The committee should provide a point of connection between

Figure 4.1: The 'data stall' at a Walworth community event

the individual clubs as well as helping to reflect on and design mechanisms for the collection, governance, and perhaps sharing of this data.

   To support the creation of a neighbourhood ethics committee, we spoke to some East Walworth residents, primarily from a few blocks around a single street, about what they thought data might mean or do for them (Figures 4.1 and 4.2). We discovered that residents are interested in data, which for them extends to inclusion of people who don't use the internet into what is perceived as a data-driven culture or economy. We also discovered that when residents talk about data they talk about connection. They want to know what is going on in the area in which they live, including who lives in the area and whether they have things in common (for example, mums connecting to mums), what is going on their area, and information that might be specifically local, such as the location of accessible green spaces. Many residents linked data to storytelling, wanting both to share and to know more about the history of their area. Residents talked about wanting to use data to influence local 'issues' that they found important or politically significant, including loss of green spaces, waste, climate, and the quality of local services. We discovered that, similar to the way that data clubs allow for practical as well as emotional reflections and forms of support, Walworth residents were interested in using data that developed hyper-local services, or that could support their everyday lives by making scarce local resources more accessible or more fairly distributed. However, they also wanted to

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Figure 4.2: Soliciting ideas and conversations about what data is needed, important, or at stake within the Walworth community
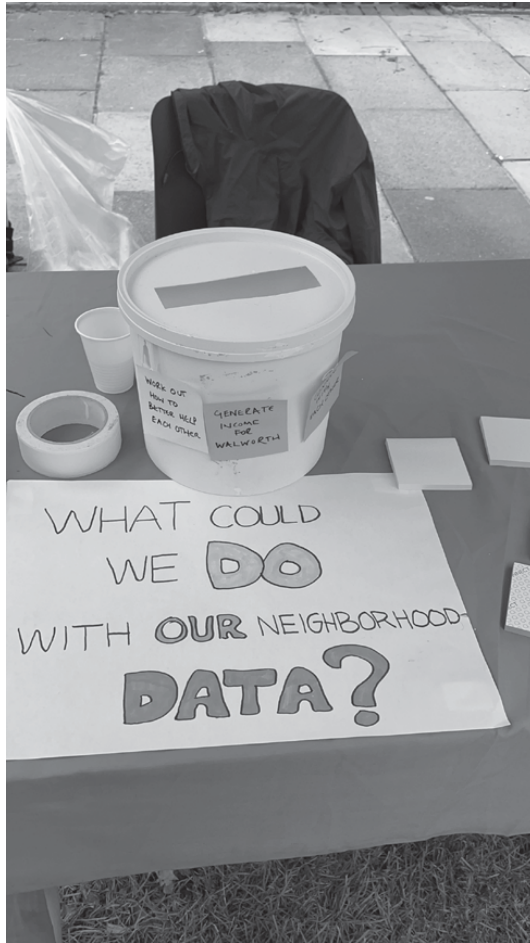
share and receive information that could strengthen identity or belonging. They were honest about the fact that existing data-based services such as the Nextdoor app didn't quite meet these needs, and nor did information from the local government.

What this ongoing research suggests is that within the frameworks provided by mutual aid, different kinds of interrogations and explorations of data might be possible. Data might simultaneously be a resource to draw on in much the same way as shared savings in a mutual aid club, or it might facilitate political action by highlighting tensions between residents' experiences and data or information collected by the local government. It is possible to imagine different kinds of data practices being supported,

interrogated, or planned through the contributions of a neighbourhood ethics committee to the practices of data clubs. For example, the committee might support the community to develop different kinds of data-based products and services, or to collect data about local experiences that could open a difficult conversation with the local government, in much the same way as occurred in Knowle West through the data commons that defined damp as a political issue. The ethics committee might also think carefully about how to facilitate relationships *between* data clubs and therefore to knit together different configurations of connection, trust, and autonomy. A neighbourhood ethics committee process thus creates an opportunity for a critical praxis of data ethics: including the capacity to define how to produce, share, manage, limit, mitigate, or otherwise reimagine data use about, or in service of community members. The significance of these efforts is not in their potential to scale up structures of mutual aid, nor to scale the value of data by collecting more of it. Instead, the significance comes from the capacity for data to be a carrier of relationships, of value, and of collective autonomy. This aligns efforts to sustain forms of mutual aid and relational care across and between scales, which also creates some of the conditions required to sustain social relations in crisis (Harrington and Cole, 2022).

Data-driven experience transcends scale

The examples in this chapter have shown how ethics in practice in relation to data challenge and transcend separations of 'large' and 'small scales'. They also illustrate that what's most often at stake in data-mediated relationships are issues of trust, connection, and autonomy. These issues are represented in varying ways in and through data and data-based systems. Balancing and transcending separations of scale requires other means of investigating how data come to mean things, and how different or more complex notions of trust, autonomy, or relationality might be developed. One mechanism for investigating how these principles might be experienced in practice could come through structured, collective experience. The 'data walking' methodology I have developed and iterated creates opportunities to practise and explore different forms of urban knowledge creation (Powell, 2018a; 2018b). In particular, data walking using role-playing and a processual experience of moving through and observing urban spaces while playing specific and well-defined roles of 'navigator', 'observer', 'interviewer', 'map-maker', and 'photographer'. Part of the delight of a data walk is the experience of needing, as a group, to define and operationalize what 'data' means, and to do this while playing the assigned roles. Data walking, as a research and public engagement process, seeks to reveal and reconfigure hierarchies of urban knowledge production. By beginning a collective, observational process of movement through an urban setting by *defining*

data, data walking invites participants to acknowledge that digital data or data-processing infrastructures are only one type of urban data. Furthermore, the fact that data walking requires and embeds performative methods and role-playing as either a note-taker, map-maker, observer, interviewer, or photographer reiterates how different kinds of knowledge combine to define and shape 'what's counted' and 'what counts.' Urban knowledge, as Shannon Mattern (2021) points out, can't be reduced to a computational figuring of data needing to be processed. Data walking, in the way I have practised it, attempts to resist this figuring. What data walking means to do is not to excavate the city straightforwardly, but rather to provide experiences of how data are brought into being. Etymologically, data are 'what is given' (see Rosenberg, 2013), but not all data are given to all. Rarely are urban residents provided the opportunity in everyday life to perform the expertise that surfaces, defines, and renders aspects of urban life that are 'in the background' into data that are 'in the foreground.' This creative research practice creates an opportunity for people to experience the making of data, including the way that this depends on the interactions between different performances of expertise and different professional identities.

Between scales: friction, tension, and turbulence

An expansive data ethics that is positioned within the frame of data-driven smart cities would need to acknowledge the paradoxes of intensive datafication and the ways that these cut across scale: the fact that on one hand, data extraction acts as a means to abstract and control individual experience; and that on the other, data-driven systems provide the ability to understand and position urban experience as something more than individual. These paradoxes are more significant in light of experiences of perpetual crisis. An example here is of climate change. As Paul Edwards (2010) masterfully illustrates, the very notion of climate as something that can be described or experienced on a global scale depends on collection, maintenance, and interpretation of data. Therefore, individual and situated experiences of extreme weather can be positioned as shared experiences of a changing climate. In their work on data ethics using the language of 'data feminism', Catherine D'Ignazio and Lauren Klein (2020) connect this situated, yet global experience to situated objectivity as sketched out by Donna Haraway in her discussions of the benefits of partial perspectives and the contestation of a singular point of objectivity.

   In relation to data ethics in practice in urban settings, these insights inspire attention to the ways that situated knowledge or situated objectivity connect with or engender forms of solidarity forged in difference. Once again, this notion of situatedness and solidarity complicates the idea that data power is built through the conflict between extraction and modelling at the large

scale, and specific and contexualized experience at small scale. Recent work on friction and tension in relation to data, knowledge, and practice has described the ways that conflicts regarding the use of data reveal gaps and contingencies of local knowledge and the potential – and limits – of data in addressing these (Powell, 2021), These ideas have also been used to illustrate the asymmetries and contingencies within global processes of data circulation (Lehuedé, 2022). Lehuedé argues that 'data turbulence' begins to apply at a global scale as a result of the increase in friction, leading to phenomena such as competitive cybersecurity efforts. Both of these views of tension draw from Anna Tsing's identification that friction is 'a central feature of all social mobilizing […] based on negotiating more or less recognized differences in the goals, objectives, and strategies of the cause' (Tsing, 2005, xii). She argues that misunderstandings within long-term social movements, far from producing conflict, actually permit people to work together. Tsing uses friction to understand how heterogeneous, unequal encounters produce energy, questioning the inevitability of seamless global flows.

Building from this, data turbulence highlights that the dynamics of tension and relationship between entities are not easy to reduce to opposing issues of 'globality' or 'locality' or even to 'materiality' and 'sociality.' Instead, the turbulence of data–based relationships playing out across the globe involves both material infrastructure as well as political philosophies. Lehuedé argues that attention to this discursive aspect highlights, in particular, the antagonism that characterizes different interpretations of digital sovereignty – including the question of whether such sovereignty is indeed possible. In the context of data–based systems, turbulence impacts questions of data localization, data storage, and the disparate material and economic impact of data processing on different geographies. This is especially pertinent when considering the climate crisis. Here, data processing displaces the long-term risks and harms of data processing into fragile geographies sometimes distant from where data are collected.

These complexities of turbulence illuminate how trust and autonomy may be decoupled from scale. While Lehuedé's work identifies how autonomy allows for a connection with territory and the claims to knowledge, experience, and legitimacy that stem from a strong connection to territory, this does not mean that these claims apply only at a small scale. Rather, data turbulence characterizes how materiality and meaning both cut across large and small scales, unsettling governance arrangements as well as claims on meaning.

This notion of a zone of turbulence encompassing both local tensions and global material infrastructures helps to break down rigidity in interpretations of scale. While it is true that 'all data are local' (Loukissas, 2019) in the sense of being most meaningful when they are closest to the situations and knowledge through which they have been defined, it is not true that data

are only meaningful or interpretable at small scale. As I described above, the practices of data intermediaries working at broad scales create different kinds of conflicts that are related to phenomena beyond the decontextualization, aggregation, or 'delocalization' of data.

Once we begin to see scale as turbulent within, across, and between the 'global' and the 'local', it becomes possible to examine the way that trust and autonomy are already challenged by extensions in space and time by different models of ownership and control of data. Following this, we can begin to see how these models might be attenuated or reconfigured across different scales and temporalities.

Here, it is useful to draw on design theorist Arturo Escobar's notion of a 'pluriverse' – a 'world where many worlds fit' (2018). A pluriversal orientation to practices of data ethics would recognize that the world of the Knowle West residents and their spreadsheets of damp data, or the residents of council blocks in East Walworth and their local histories, can exist within and alongside a concern over the kinds of information that is, or is not, shared by the local government or the national state. Equally, the pluriverse can contain a world in which East Walworth residents convene a neighbourhood ethics committee that shifts the kind of products and services designed for and used by its residents. Escobar's concept resists the idea that all things need to be related to each other along a single logical axis, reminding designers and practitioners that different feelings, conceptions, beliefs, and actions can exist simultaneously, shaping how different experiences and outcomes can result from encounters with the same things. If this world seems constrained by the current political–economic realities, that does not make it impossible.

Indeed, a focus on friction reinforces the way that different possibilities emerge as a result of tensions or difficulties. Anticipating difficulty rather than seamlessness provides a way for widely differing practices to become apparent, challenging the notion of a smooth shift in scale from small to large or a seamless set of data predictions. Friction may be inherent in commons. Resource-based commons, like pasture or fishing grounds, are governed by agreements between all of the beneficiaries and participants in the commons. Often, researchers assume that the management of these commons depends on applications of consistent rules within relatively small, homogeneous communities (Hess and Ostrom, 2005). This isn't always the case. In investigations of data commons, for example, researchers contrast the way that expansions of intellectual property create 'anticommons' that produce conflictual relationships around the use of data, with the production and management of data commons providing an alternative (Fisher and Fortmann, 2010). Writing about the ethics of contributions to data resources like biobanks, Prainsack and Buyx (2017) argue that solidarity is expressed through action, not thought. In Knowle West, for example, there was little sense of a shared position or problem until sensing data started being

collected, at which point 'data defined the community […] defined the way people thought about community' (Powell, 2021). The data collection thus established action.

Conclusion: Transgressing scales as a matter of structural care

This chapter has explored how frictions evident at, between, and transgressing different scales of 'smart' or 'data-driven' systems highlight the importance of trust and autonomy in undoing dynamics of exploitation, extractivism, or alienation. It has also identified that creating opportunities to decide on what data is and how it should be made, managed, and valued can unseat assumptions about the inevitable, perpetually enduring power of large-scale data processors. This is not to discount the practices that the chapter also outlines, whereby already powerful actors create or employ regulatory gaps in order to create new means of commodifying or profiting from data. All of these practices are dynamic, and all are absorbed in creating and defining meaning and value. In addition, they take place within a context of perpetual crisis, where techno-systemic frames are often leveraged as means of survival, suggesting a lack of alternatives to broad-scale, abstracted, and alienated modes of governance. Yet, as always, other possible worlds can be contained in this one. To conclude, I reflect on how the unruly scales of practice presented in this chapter might demonstrate structural care.

Mattern (2021) describes the importance of embedding understandings of maintenance and repair into considerations of urban data ethics, connecting these to other contemporary struggles, 'Amid the uprisings of spring and summer 2020', she writes, 'Deva Woodly emphasized that #BlackLivesMatter is a movement committed to *structural*, rather than merely individual, care' (p 120). Care is contentious: as Judith Butler (2020) points out, it is not always consensual. It can also be enacted as compulsory within some professions and (often gendered) social roles: care is expected across the service industry and especially by nurses, social workers, and receptionists, as well as by day care and nursery workers – not to mention parents. Care links together experiences of both autonomy and vulnerability, and hinges on trust. We can see care expressed across the frictions and tensions, the turbulence and the incommensurability of data. Structurally, care is enacted in establishing regulatory frames, but perhaps even more significantly, in ensuring that these are enforced. At the level of service delivery, the concept of 'relational public services' calls on the practices of care that are the legacy of charitable and voluntary organizations, while the frictions that emerge around the use of data in these contexts demand new forms of expertise, participation, and civic attentiveness. These are all new forms of care, of course.

The question, as the perpetual crisis continues to shrink states, delegate responsibility for urban systems to powerful corporations, and to reduce the liberal structures for democratic participation, is how to exist within the turbulence, how to enhance practices and infrastructures of care, and how to imagine other possible futures. If this chapter has done some of this, I give thanks.

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