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The data walkshop and radical bottom-up data knowledge

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How, and under what circumstances, would it be useful to produce big data from the bottom up? The assemblages that we consider to be part of the production and positioning of big data are themselves large-scale: the computing power required to deal with multiple forms of digital data, the analytics processes required to derive sensible or logical predictions, the institutional meaning-making apparatus required to create frameworks and application spaces for this data are all easier to mobilise top down. In an article on big data from the bottom up (Couldry and Powell 2014), Nick Couldry and I foreground individual agency and reflexivity as well as the variable ways in which power and participation are constructed and enacted. But the kinds of civic assemblages that we identified as examples of bottom-up big data don't operate in the same way as those from the top down. This chapter examines some strategies for examining public matters of concern in relation to data production, following from and developing from previous efforts at surfacing and valorising situated knowledge in particular urban contexts, and identifying how 'bottom-up' data subjectivity could become collaborative and collective through the use of participatory meaning-making processes. This approach allows us to attend to who is asking the questions about big data, and, further, lets us think about how data gets to be 'big' in the first place, who asks the questions that make it big (in size as well as importance) and how one might ask different kinds of questions. This chapter focuses on the genesis and development of the Data Walking

project (see http://www.datawalking.org) as a means of asking different questions about 'big' data, space and local knowledge.

The data walk

The 'data walk' or 'data walkshop' is a radically bottom-up process of exploring and defining data, big data and data politics from the perspectives of groups of citizens, who walk, observe, discuss and record connections between data, processes of datafication, and the places that they live in. This produces an opportunity for collaborative and collective reflection on and production of ideas about data. Briefly, it works like this: after a large group discussion that opens out avenues for defining or understanding data, participants are assigned specific observational roles based on their interests, and take a walk in a local area in a small group. Each member of a walking group has a particular role in observing and documenting encounters with data, and each group is tasked with observing places and spaces that they interpret to be 'data calm' and 'data rich' and where they may observe 'data activations' where data (as defined by the walkers) intersects with other modes of being in the world. This could be the intersection of data and citizenship, the relationship between data and bodies or the construction of value in relation to data. They are also asked to identify places of data resistance. At the end of a walk, where the groups have been asked to document their movement with a map, observations, collection of physical objects, they need to tell others a story of their journey. Data walking can be used as a tool for civic engagement (Balastrini 2017), or within a broader set of reflections on specific social or economic processes (Crutchlow et al. 2016). These applications work through data walking's potential to create a phenomenology of data, and link this process to previous ethnographic explorations that focus on space, movement and context in the production of knowledge (Lee and Ingold 2006). Through the framework provided by the observational roles and the kinds of data relationships they are asked to observe, participants construct a narrative for how they define and critique data in place. The whole experience, based on an encounter between participatory ethnography and devised performance, opens out a process and possibilities not only for 'doing big data' from the bottom up but for creating new ways of being with and ways of knowing about data

in everyday life. Examples of the intersections are given later in the chapter.

This chapter outlines the genesis of the data walk as I've practised it, focusing in particular on the contribution of artistic practice to social science research and the necessity for creating new modes of interdisciplinarity to address the phenomena of data. The chapter also describes how the data walk process operates to articulate data to other concerns, employing many of these interdisciplinary elements. It charts my unfolding engagement with art practice and the insights that this provided to social scientific and public engagement work and identifies how these processes help to move beyond a focus on 'data subjectivity' as the primary way that datafication is experienced. It reflects on the data walk process as a means of surfacing the everyday experiences and reflections that many people have in relation to data by involving people with interests and concerns about data in ethnographic practices of observation and reflection. The chapter suggests that 'top-down' data assemblages need not necessarily be contested with parallel 'bottom-up' ones but perhaps instead with alternative modes of making sense. In conclusion, it reflects on the outcomes of this process not only as a form of community or civic engagement and as a conceptual tool for generating alternative epistemologies and ontologies for big data as well as datafication, highlighting that challenging narrow, instrumental or coercive use of data may also involve creative and expressive knowledge production.

Genesis of the data walkshop

As this chapter discusses, walking reflections have been used by philosophers, psychogeographers, urban planners and community organisations to explore relationships between people, ideas, knowledge and space, and sometimes to locate local assets (my version of the data walk began as a teaching tool, specifically intended to provide students with a physical, spatial and sensorial experience of the ethnographic experience of data proliferation, while helping them to understand the concept of situated knowledge (Haraway 1988). One of the expectations of the original student workshops was that students would come to understand not only how one's particular position of

observer renders the experienced world of the city into data, but also how multitudinous this data might be.

The exercise was devised as a conceptual counterpoint to the celebratory rhetoric of big data, and undertaken at the same time as students read polemical celebrations of big data (Mayer-Shönberger and Cukier 2013) and their critiques (boyd and Crawford 2012). Over the course of several years I used the model in many contexts, including with the artist Paula Crutchlow and the Furtherfield Gallery in Finsbury Park, north London, and Exeter in the south-west of the UK as part of the Museum of Contemporary Commodities project, with urban planners at a seminar hosted by the Centre for Big Data Ethics and Microsoft Research in Cambridge UK, with data ethics PhD students in Copenhagen, social activists at the World Social Forum, and interested researchers, students and locally based workers at two sessions sponsored by the Learning Technology Innovation centre at the London School of Economics. From the beginning I was interested in using the loose form of the 'walkshop' to create a space for the exchange of different ideas, and to learn about how people with different expertise understood or defined data. As time passed I also began to see how the 'data walk' as an event, staged the possibility for new forms of collaborative knowledge production.

Originally based on a proposal for 'flashmob ethnography' framework intended to create more participatory forms of ethnographic practice (Forlano 2010), the data walk also integrates Adam Greenfield's network walkshops where attention is directed to digital networks as they appear perceptively in city space. Forlano's version of the walking experiment called for small groups to explore areas that they were unfamiliar with, with each member of the group responsible for a particular feature of the ethnographic encounter: photography, map-making, thick description and interviewing. In Forlano's original experiment, the goal was to observe 'the role of values in urban infrastructure and the built environment (including public spaces, retail shopping environments, restaurants and cafes). Specifically, the workshop encourages participants to look for and document tensions, surprises and counter-intuitive findings' (Forlano 2010). This practical approach seemed especially appropriate to introduce to my students, who were simultaneously debating the significance of big data for social research. I also directed the students to examine

places that Greenfield found suggestive of the connection between network, space and civic action:

Places where information is being collected by the network.

- Places where networked information is being displayed.
- Places where networked information is being acted upon, either by people directly, or by physical systems that affect the choices people have available to them.

Combining Greenfield's focus on spaces of mediation with Forlano's structured roles for non-expert ethnographers provided a framework to direct the walk and also a means for students to narrate their findings, but it also set up a way for the students to distribute expertise between themselves, and to transform their insights into potential action. In the first walkshops, the walking and observing were followed by a workshop using 'critical making' to interrogate the relationships that the students observed and to imagine potential reinterpretations or critical futures. Critical making has been lauded as a means to inspire active citizenship (Ratto and Boler 2014) and celebrate everyday practice and experience of life. Critical making focuses on how do-it-yourself creative production can act as a form of everyday political and social critique. In applying critical making as a pedagogical tool (Powell 2012b) I introduced students to ideas of thinking together through material and bodily practice (Crawford 2009) and continuing Hertz's (2012) activist design project of using critical design and critical making to advance alternative futures.

The walking, observing, reflecting and remaking originally appeared within a frame inspired by de Certeau's attention to everyday life (1984), Benjamin's celebration of walking and reflection in the Arcades project (trans. 1999), the psychogeographic tradition and other radical reinterpretations of life in designed spaces such as the Situationists. Walking and watching are practices that create the cultural life of cities, and I wanted to articulate these practices to the technological mediations that I had been investigating in other research, particularly on the concept of the 'smart city' as it evolved over time (Powell 2008, 2011, 2016). If attentive walking could bring new spaces, new phenomena and new knowledge into being, perhaps it could also serve as a way to bring new understandings of data.

Conceptual antecedents: rethinking the smart city and the objective god-eye

The observational approach was also inspired by Haraway's (1988) concept of situated knowledge. Following Haraway's acknowledgement that the 'god-eye' of science must be made to see in a particular way, the workshops also intended to highlight the inevitable consequences of deciding that one thing, rather than another, might become data. From the beginning, the walks had a constructive orientation: students were asked to use the multiple types of ethnographic data that they had collected to produce future interventions in the city spaces they observed. This was not only 'data analysis' but a play or commentary on the possibility (or not) of intervening in how cities are mediated and experienced.

I had been interested for some time in the mediation of city experience through technology, and in particular in the structure and experience of 'smart cities' as locations where particular types of technological mediations (like the idea of data being generated, gathered and processed to generate insights about the world) might become part of the repertoire of understanding. I'd already written about how activists who installed wireless internet networks might be thought of as 'rewriting' their own city by layering their own vision of it technologically (Powell 2016). I followed scholars who reflected on 'the insertion of procedure into human knowledge and social experience' (Gillespie 2014). This notion of procedure in turn reframes how data is understood and positioned in relation to prediction or potential: 'what makes something algorithmic is that it is produced by or related to an information system that is committed (functionally and ideologically) to the computational generation of knowledge or decisions' (Gillespie 2014: n.p.). I was thinking a lot about the design of smart cities, the ways that particular discourses of data seemed to frame a 'calculative' exercise of citizenship. I had been considering how citizen science, open data and other civic movements built new politics from producing, curating or calculating data (Powell 2016). But I found it difficult to step outside the technological framework and see data in a broader context.

Current critical scholarship on the 'smart city' – the framework that motivated my initial development of student walks – assumes that specific kinds of data are produced within large-scale civic projects

(mostly public–private partnerships) and that this particular form of datafication produces a kind of ideal data city. This is the totalising vision of the smart city pilloried by Greenfield as 'any-space-whatever … generic technologies on generic landscapes in a generic future' (Greenfield 2011: 149). The assumption is often framed in the way that Flyverbom and Madsen express it: 'the city that becomes visible is a city that fits in with existing projects and strategies' (Flyverbom and Madsen 2016: 149). The datafied 'smart city' might, as Gabrys (2016) conceives of it, be a Foucauldian project where citizenship ceases to be connected with the exercise of rights and responsibilities and begins to be related to the capacity for citizens to act as sensors, absorbing and presenting computational information. Gabrys writes, 'participation involves computational responsiveness and is coextensive with actions of monitoring and managing one's relations to environments, rather than advancing democratic engagement through dialogue and debate' (2016: 9). This view of citizenship and participation in the data city is active and responsive, but unfolds what Gabrys calls a 'biopolitics 2.0', a biopolitics of construction in and through the calculative. This is similar to what Cheney-Lippold (2011) understands as the 'soft biopolitics' established in relation to the identities constructed by and through the correlations that emerge when one processes online data.

Within the critical literature on 'smart citizenships' some scholars (Tironi and Criado 2015) ask whether citizen production of data like 'collaborative mapping' might establish another opportunity to slow down the intensification of calculation, or display different forms of sensitivity. They wonder if this might be part of a bigger project of cosmopoliticisation, as Isabelle Stengers (2010) calls it, where new potentials are made public without concern for praise or criticism, and where new modes of engagement with urban data might be possible. Many other scholars, like Ratto and Boler (2014) and DiSalvo (DDIB2014) take this perspective as a means of supporting the experimental approaches of DIY technical and cultural subcultures. Aligned with other DIY movements (Powell 2012a, 2015) and interventions in urban spaces (Corsín Jiménez 2014), experimental and cosmopolitical data citizenships experiment with the potential for a computational world. But as much as these ways of thinking open out new contours for smart city life, to me they also raised questions about whether, how, and under what circumstances different kinds of people

living in cities might be able to question and intervene in the idea that city life has become datafied or computational. The data walk began to appear as a way to open out discussion and DIY practice beyond people already engaged in it.

Interdisciplinary encounters

My ideas about walking, data and ways to devise an open engagement with data and cities expanded through an interdisciplinary encounter and subsequent work with artists. In early 2015 I was invited to Furtherfield Gallery in Finsbury Park, north London, to meet the artist/geographer Paula Crutchlow, who was starting a project called the Museum of Contemporary Commodities. Paula was working with the geographer Ian Cook on MoCC (Crutchlow et al. 2016), which was a research-creation-engagement project aimed at examining trade (in)justices as collective future heritage. Paula and Ian wanted to lead a walk as part of their programming. I thought I could modify my teaching tool as a public engagement strategy, and connect my interest in data to Paula and Ian's interest in trade. As part of this project I led two data walks with groups of artists and local residents around Finsbury Park. Later, I travelled to Exeter to host another data walk at the Museum of Contemporary Commodities pop-up.

This encounter and the resulting conversations transformed and enhanced the perspective and the process of the data walk. Paula had been using walking as a research creation tool for many years as part of her wider practice in performance making. She was integrating this with ethnographic process through MoCC, conceiving of this as critical art practice. She explains:

> Devised theatre often consists of democratic and non-hierarchical experiments where the framework for what is being made is set up by the collaborating group who write, assemble, edit and perform the materials together … Cross disciplinary processes are shaped by participants' views, beliefs and life experiences and, when situated outside theatres as site-specific or mobile, the sense of place in all its 'thrown togetherness' (Massey 2005) becomes central to event dramaturgy. MoCC was co-designed to combine these approaches with Ian Cook's followthethings pedagogical focus on trade (in)justices and cultural activism (Crutchlow et al. 2016). The research aim was to collaborate with other academics, technologists and publics across disciplines to

> produce what George Marcus calls 'para-sites' 'intermediate forms, platforms and digital compositions, contemporary contraptions …', critical art objects and events that 'push' ethnographic texts back into the production of field work by posing pedagogical challenges and experiments. (Cantarella et al. n.d.)

Where I had been considering the idea of observing data as a corrective to an objectivist 'smart city' frame and as part of a strategy of civic conversation, Paula and Ian had a more specific focus on the experiences of people trading and valuing in and near Finsbury Park, and on the phenomenal experiences of datafication of space and commodity relationship, which often produced feelings of guilt in relation to a 'perceived lack of personal agency and empowerment within globally networked systems of governance' (Crutchlow et al. 2016). Grounded in her training and experience as a performance artist, Paula's perspective on walking included a focus on movement and the transformative experience of participating in an intentionally 'disruptive' creative act. Her view of the walk revealed to me its potential as a new phenomenological experience and a way of producing alternative knowledge about the city, using performance to destabilise social hierarchy and reform the potential for collective experience. Paula writes:

> The data mediations of increasingly privatised and hyper-surveilled urban space render the poetic tactics of walking in the city as imagined by de Certeau more likely to contribute to administrative strategies of consumption and security than to acts of creative resistance. Pervasive datafication and its concrete shapings of places, practices and flows might also raise questions as to whether it's desirable or even possible to develop subjectivities that are outside of or resistant to these processes (Smith 2016). Data walkshops are not the kind of exceptional cultural practice that we might understand theatre to be, but their deeply social and convivial performativities help us to unpack, negotiate and story data mediations in ways that acknowledge and use these contexts to generate potential for new performances that are consciously, purposefully and artfully constructed. (Crutchlow et al. 2016)

In the course of working with Paula and Ian I came to see the power and value of using structured small groups to create shared definitions of 'data', 'information' and 'knowledge' in a non-hierarchical way, which aligned with my interest in using data walks to investigate

partial perspectives and different ways of constructing knowledge. I also learned that one of the features of this kind of work was a decentring of research expertise through involving people in a structured experience akin to a performance. In the walkshops that we held together, playfulness dominated and subjectivities shifted among artists, researchers and residents. Participants, with their specific roles to perform, observed the world but also experimented with playing at observing the world. Rather than assuming that ethnographic observation collects truthful observations, this perspective points out how much our situated knowledge is constructed through our experience, and invites us to shift that experience, and to be reflective about what the shift produces. Paula characterises the narrative reporting of the walks this way:

> On returning, embodied and imaginary practices are used in a performative re-journeying of the route, where participants are both experts in their own experience and collectively responsible for representing the group findings. Constructed as provisional, discursive and held in common, these re-visionings de-centralise the researcher's authority, creating fragile inter-subjectivities and layered imagery that are perhaps suggestive of how temporary and contingent the structures of data mediation are themselves. Through both close reading of structures and the imaginative play of group narrative they generate tactics for resistance, the means for subversion, and propositions for pedagogical artworks that question and re-value. (Crutchlow et al. 2016)

This encounter provoked me to think very carefully about how much of the meaning or significance of data was dependent on its mediation and interpretation, and how for any of the different kinds of people attending the walkshops, from urban planners in Cambridge to students in London and artists in Exeter, data might mean different things, things that could be surfaced through the shared experience of the walk. Fundamental questions about what constitutes data, how any data might be contested, or how experiences of datafication might be challenged or reimagined, emerge from this process.

Data walk process: data walkers make trouble

Building on Paula's identifications of the radical potential to reposition subjectivity and disrupt the process through which we encounter data

in everyday citizenship, I began to focus more on the phenomenal experience of the data walk (in line with the long history in social science and art practice, including Lee and Ingold (2006) and Cantarella et al. n.d.) but in particular on how this performative, phenomenal experience introduces new ideas about expertise and data politics. I opened up data walks as a process of experience and inquiry to many different groups, targeting meetings and contexts where I thought the approach might be complementary. The organisers of these events advertised the data walks, and interested participants appeared. This meant that over time I held walks with many different kinds of people, from urban planners to community advocates, PhD students to residents of many different sorts of neighbourhoods in many different kinds of cities.

I began to see how the experience of destablilising expertise and learning on the move in a small group created new pathways for learning and for sharing knowledge, as well as generating processes of individual reflection on the nature of expertise. One of the artists at Finsbury Park specified that their favourite feature of the walk was the chance to meet different local people and understand how they were thinking about some of the same issues. Other participants in other walks also highlighted this exchange of expertise as a key feature of the experience. In a small group, with no leader, with defined responsibilities to document as well as to respond, all knowledge is revealed as situated. When organisers asked for responses from participants about what they particularly appreciated about the walks, people responded that they enjoyed 'the chance to observe data in the street with others' (Montreal) and 'everyone's enthusiasm – and everyone's suspicion of the environment' (Exeter). A 'suspicion of the environment' brings to mind Gabrys's notion of 'environmental subjectivity' or an orientation of the self to the environment. But this subjectivity is not necessarily constructed only through observation of data but rather through the critical manoeuvres that participants used to interpret data. Even so, subjectivisation through data is not the only way that people experience data, and a performative method can help to introduce others and to move encounters with data from the individual to the collective. As the project matured, I built the DataWalking.org website to explain the process and open up exchanges with others experimenting with it.

Situating and reflecting on surveillance

Some work in geography as well as communication studies assumes that urban mediation consists of what Flyverbom and Madsen call 'data produced by objects' (2016: 1) – the strata of data produced by sensors and cameras. As the emerging literature on data, space and value indicates, this data becomes integrated into organisational, calculative and decision-making processes that structure the experience of urban space. A narrow view of 'environmentality' might suggest that the data produced by objects helps to construct that subjectivity. But our walks suggest that it is the performance of observation and narrative reconstruction that produces this subjectivity, and that this can be transformative, especially as it produces new forms of collective or collaborative knowledge. One common element of critique was the experience of observing traces of data-based surveillance. In every walk, some participants photographed the banal architecture of surveillance: blank-surfaced round surveillance cameras hanging from above in university campuses and privatised shopping areas, passcode-protected gates and doors that close spaces off to those without the data, and railway station turnstiles with RFID readers that collect data on who passes.

But many of these installations are inscrutable on their own. It is impossible to know whether the camera is functioning, or how the RFID transport data is packaged up and sold – much less to whom. The frustration at the unknowable and inscrutable enrolment of individuals into the 'calculative frame' caused many data walking groups to look elsewhere and to create, through their attention, different kinds of data assemblages. Sometimes this happened through a violation of the social expectations that permit us all to tolerate such inscrutable installations. In Copenhagen, a group walking near a newly constructed public library building in an official 'campus' area encountered a large brushed metal pole, similar to a telephone standard, about a metre and a half at the base. They circled it and stood taking photographs until a security guard appeared from inside the building. The object, it emerged, was part of a perimeter security project – which the walkers learned in a long interview with the security guard. In this interview (which some non-Danish participants found surprisingly open and revealing), the guard described how

the perimeter system was installed to prevent graffiti being painted on the wall of the building. The group found this particularly striking as a building about 100 metres away was covered in graffiti – but they were informed that this was a 'graffiti zone' and the public library needed to be protected from it. Here, attention to data and its ambiguities produces new relation and new understandings of geographies and politics.

Investigating data assemblages

In several other walks, participants focused on what they saw as evidence of 'the digital' in the city – observing web addresses, telephone numbers and indications of networked information systems laid over physical spaces. They photographed and described occasions when web addresses were posted (or, in one case, carefully hand-painted) on exterior buildings and speculated on what might have been implied by these links between the physical world and the online world. In Copenhagen, a non-functional web address was written on to the wall of a community gardening and social support project housed in a weathered wooden hut. Walkers juxtaposed the invitation to access information on the Web with the many different kinds of concrete data and information (including tools, plants, soil, labels and instruction) present around the gardening shed. This experience echoes other work on the layers, and splinters, of data geographies (Kitchin 2014; Graham and Marvin 2001; Crang and Graham 2007).

Such apparatus of data subjectivation are therefore not the only, or far from the most important, elements of datafication experienced in everyday life. Our data walks revealed another set of constructive processes. Critical data scholars focus on how the operations undertaken on and in relation to data structure its value and power. Classification, organisation, processing and visualisation of data are defining features. As Gitelman (2013) has identified, the imagination of data is in some measure always an act of classification, of lumping and splitting, nesting and ranking, though the underlying principles at work can be hard to recover. 'Once in place, classification schemes are notoriously difficult to discern and analyze' (2013: 8f). I initially imagined that data walks might intervene in these classification processes by providing the opportunity for walkers – as citizens – to

observe, audit, or resist surveillance or data classification, but instead they exploded it.

The huge range of ways that data walkers interpreted the question of 'what is data?' blew up my expectations that technologically mediated data would be the primary focus for reflections about knowledge or citizenship.

Participants developed nuanced ways to get beyond the performance of tactics against strategies, and instead plunged into the conceptual challenge of looking for and observing different kinds of data, or, as one participant put it, the potential to 'see the invisible'. In Montreal, participants reflected on the collapse between data and information, the consequences of permanent tracking of shared cars and bikes versus the temporary appearances on city streets of the 'non-datafied' versions, and the significance of different kinds of data for knowledge of place and its potential inequalities. They photographed 'non-datafied' bus stops in counterpoint to the data-linked, sensor-enabled systems for parking and car sharing, and tried to see community gardens as 'data' that illuminated potential processes of communal transformation to self-organised commons. Rather than seeing data as quantity as Maurer and Boellstorff discussed, walkers understood data as the quantitative and qualitative elements that are important to a particular community – one of the Montreal walkshops derived this definition.

Data for someone else – decentred perspectives on data

Another persistent fascination, likely linked to the non-hierarchical repositioning of expertise within data walks, was an interest in the data or information that walkers knew was important to a system, but which they couldn't interpret. In Finsbury Park, the markings under train tracks fascinated one group of walkers, who read the combinations of letters and numbers as important data destined for another audience. In Montreal, walkers read graffiti along with barcodes and identification markings as 'information that we can't know about'. 'Data produced by objects' is only one way urban life has become datafied, although it is often the focus of attention and critique. For example, Thrift's most recent (2014) work on 'sentient cities' concentrates on the ways that new data produced by sensing technologies.

Instead, other processes might be equally relevant, for example the classification and knowledge production based on this. The walkshops suggested ways to reflect and reimagine which things are worth attending to: in three walkshops participants used technological tools to expand their observation of 'the invisible'. In Finsbury Park one of the artist–participants reappropriated a domestic scanner to produce data-glitchy photographs, distorting the usual visual perception of the city by (incorrectly) rendering it as data. If data are 'produced by objects' in this assemblage, the production is faulty – so what does that make the result? In Copenhagen a group programmed a random walk generator as an algorithmic intervention into the choices that they might make in directing their walk – a significant portion of their walking time thus included negotiating with and eventually reprogramming the algorithm. In Montreal, one group used their mobile phones to display the number of WiFi signals at different points along a busy street, including markers on the maps that they made as to where most WiFi spots could be found. Later in London, a reporting narrative from one group of walkers melancholically mused on the inability of the members to really understand what they were passing by in the city. Without being forced to pay attention, they had inadvertently walked past dozens of locations of historical significance. When we attend to the city as a site of data it changes what it is: historical monuments become only one set of elements that might surface from a space of invisibilities and power relations.

Data walk outcomes

Processes of counter-subjectivication

Data walking potentially produces a way to create different experiences of data subjectivity that engage with new definitions, contentions and resistant positions. In particular, these are constructed from relationships *between* participants as they collectively seek to define and make meaning from data. These collective subjectivities exist beyond the helpless passivity that so many theorists claim must result from producing data that is then used by corporations (van Dijck 2014), beyond the open data auditing that requires entrepreneurial subject positions (Irani 2015). They move data subjects into a space that might respond to, as Birchall puts it, 'the demand not to be reduced to, and interact with, data in ways delimited by the state; to

resist the terms of engagement set by the two faces of shareveillance (i.e. sharing data with the state and monitoring that shared data)' (2016: 9). In some data walkshops I asked participants if what they had learned changed how they acted in relation to data. None of the participants mentioned limiting the data that they produced, necessarily, or even changing their behaviour to avoid producing data that might fit into the assemblages we discussed. Instead they considered how the practice of walking and thinking and paying attention changed their city and provided 'heightened awareness of potential places to intervene' (Montreal).

If participants are attending to data as evidence of surveillance, they may find it. But by performing expertise within a data walk, people can make other things filter into view, 'become data' and connect to other people and other matters of concern (Latour 2004). Data walking might be considered a strategy for becoming a data citizen. Across the different groups I met, a few shared themes emerged. One was an interest in attending to the liminal – to the edges and curiosities of urban life, and where these were inflected by, resistant to or integrated into data systems. In London a group I walked with received a wonderful lecture on the development of post boxes and the way that this disintermediated communication – creating a binary system of 'stamped/not stamped' mail. In Cambridge one group fixated on the traces left by fallen leaves, which they wished to be able to interpret with as much factual meaning as the affective power the arrangement created for them.

People also navigated in interesting ways the barrier and balance of datafication by forcing visibility of the invisible in some cases, and by trying to document the everyday excesses of datafication: composing maps of their walks by noting the positions of maps placed in the street, documenting competing and contradictory numbering systems inside university buildings and at bus stops, or proposing new data interventions to highlight assemblages that are less visible – like proposing to collect data on the use of the Exeter Pound local currency. For some people, there seemed to be a politics to this – a push against full datafication where this might bring optimisation: 'what would be the point of a totally organized city? Where nothing happens?' (Montreal).

In the last data walk before the time of writing, I heard back from one of the participants, who had been particularly taken with the form

of the walk, which he saw as linking the objectivist and phenomenological views of data. He noted that by providing distinct roles the walks not only distributed or destabilised expertise, they also narrowed the 'data' that would be collected. Similarly, requiring a map forced a performance of a narrative that also created a particular specification for the knowledge. I agree; this play of structure and movement is one way to break down the distinction between data as 'what is given' (perhaps even fact) and data as something that must always be made, through observation, expertise, filtering, contestation and narrative, in conversation with others. Data walks, through their collaborative and performative structure and invitation to phenomenal experience, create a method for creating different kinds of data, but also for challenging some of the ways in which top-down big data paradigms are narrowing the ways that data might be experienced or researched.

Paying attention and staying with the trouble

The data walk process, with its focus on paying attention and attending to the liminal, also suggests ways and means to undertake what Isabelle Stengers calls 'paying attention' (2010) and Haraway 'staying with the trouble' (2015). Both of these feminist philosophers suggest that current ways of thinking about science – that is, thinking about 'data' objectively – block us into thinking reductively about our relationships to the worlds that we build as well as those into which we come. This is at the root of Haraway's (2015) critique of the concept of the anthropocene – the notion that it has been human activity itself that has so transformed the living world and our relation to it. She acknowledges that the Capitalocene might be more descriptive, given that the scale and intensity of changes to world-systems have emerged with changes to scale, rate/speed, synchronicity and complexity. Fundamentally, Haraway suggests that the way forward is to push into a Cthulucene, a world-thinking mode that 'entangles myriad temporalities and spatialities and myriad intra-active entities in assemblages – including the more-than-human, other-than-human, inhuman, and human–as–humus'. Taking these new positions makes spaces of theory that are large enough to help 'reconstitute refuges, to make possible partial and robust biological-cultural-political-technological recuperation and recomposition' (2015: 160). This species-being position

seems far from the interest in observing human–made mediations involving abstract data within human–made cities. Philosophically, however, the data walk's intense focus and attention to the construction of mediations and their meanings start to make the assumption of a 'god-eye' seem untenable – along with the idea that only certain kinds of actions get to be rendered as data.

The stories of liminality, of inscrutability of the data and information produced in cities, speak to the troublesome nature of mediation, which is one way that 'the being of humankind is to be outside itself' as Bernard Stiegler (1998) argues. Kember and Zylinska (2012) push this further, calling for an ethics that acknowledges this 'productive engagement with alterity'. As media begin to settle into becoming data, then radical media studies might perhaps be encouraged to see, reckon and manufacture data differently. I encourage other researchers to pull out these threads and develop them as datafication sinks into the communicational everyday.

Conclusion

My data walks resulted from a wish to intervene in a space where data is often viewed as objective, and where its 'bottom–up' subjectivity is often oriented to the individual, not the collective. When it is viewed as constructed or phenomenological, scholars have struggled to create room for people's situated, everyday, emotional or non–expert knowledge in relation to this construction. Over its evolution and encounters with other walking traditions and their political and philosophical positions, my version of the data walk has specified a framework for radical, collective, bottom–up knowledge creation and sharing, with an element of performative practice. It has proved capable of being articulated with the interests and concerns of a range of different people who have listened, walked, observed, defined and laughed about data, information, knowledge and place. It has produced collaborations, friendships, misunderstandings and the capacity to listen to many retold stories about 'what we started to see emerging' as groups of strangers walked in cities and tried to perceive relationships that were not always visible – and then tried to tell stories about them. To counter the emerging ontological frames that fix data as something larger than the individual, forever controlling and inscrutable, and the epistemological frameworks that claim data as truth,

the walks may provide a radical relief. These activities, in their sheer humanity, reposition knowledge and feeling, opening up the possibility that data might be created through these performative acts. Can they act as full counters to the datafied experience of everyday life? That is not the question. Can they provoke joy, curiosity and engagement? New ways to tell stories and new ways of thinking about why data matters? Perhaps yes, and that is what matters.

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