Actually-existing sociality in a smart city: the social as sociological, neoliberal and cybernetic

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abstract

This paper explores the forms of sociality that are implicit in discussions about a range of smart projects in one actually-existing smart city. Current scholarship on smart cities focuses almost entirely on their digital infrastructure and on the figure of the 'smart citizen'. This paper argues that smart city projects also emerge and develop through specific understandings of the social. The paper explores understandings of smart sociality by analysing nearly sixty interviews with a wide range of actors involved in smart city projects in the UK city of Milton Keynes. Implicit in those interviews are three overlapping but distinct forms of smart sociality, which the paper terms *sociological, neoliberal* and *cybernetic*. The paper argues that it is important to engage both empirically and theoretically with these three understandings of the social in relation to smart, because they suggest that the reconfiguration of human activity assumed in smart city discourses is more diverse than most current scholarship acknowledges. The paper concludes by arguing that if this diversity is to become a critical resource, urban scholarship must give more empirical and conceptual attention to cybernetic forms of sociality in particular.

keywords: smart city, smart citizen, neoliberal sociality, cybernetic sociality, society of control

1 introduction

There is by now an extensive literature on the smart city (key references include Greenfield 2013; Halpern et al. 2013; Hollands 2016; Hollands 2008; Kitchin 2014; Marvin, Luque-Ayala, and McFarlane 2016; Karvonen, Cugurullo, and Caprotti 2018). The term 'smart' refers to the use of digital data to improve urban governance. For example, city authorities and commercial providers suggest that smart policies and technologies can enhance environmental sustainability by enabling the more efficient use of resources, especially energy and water; or that traffic flow or air pollution can be improved by using real-time environmental data; or that economic growth can be increased by innovating new products and markets based on digital data. Smart cities therefore convene a variety of actors to achieve a wide range of aims and effects.

Most critiques of the smart city have thus far focussed empirically on two aspects: its digital infrastructure and, more recently, the figure of the 'smart citizen'. Early work on digitally-mediated cities examined how software produced urban space automatically (Thrift and French 2002) to create cities that were "splintering" (Graham and Marvin 2001) and surveilled (Crang and Graham 2007). This was important work and much subsequent scholarship on smart cities over the past decade has followed its lead, paying particular attention to how digital data and technologies have been used to prioritise economic

growth over, for example, environmental sustainability or social justice (Joss, Cook, and Dayot 2017; Luque-Ayala and Neves Maia 2018); or the ways in which the commercial software is presented as the solution to urban governance such that entrepeneurialism, innovation, outsourcing and profit are normalised (Sadoway and Shekhar 2014; Sadowski and Pasquale 2015) and "the social contract is replaced by the corporate contract" (Sadowski and Pasquale, 2015: np). In Kitchin's (2014) influential paper, all these analyses culminate in the overarching accusation that smart cities are, or are intended to be, neoliberal technocracies.

More recently, much scholarship on the smart city has focussed on the figure of the 'smart citizen'. Indeed, if "the smart city is fundamentally about redefining and reconfiguring relations within and between people, their community, government and the urban environment" (Ho 2016, 3103), the smart citizen appears to be at the centre of that reconfiguration. Many non-academic stakeholders in smart products and smart policy-making, from the European Commission to corporations to startups to city governments, have realised that many smart projects are ineffective unless city inhabitants are engaged (Joss, Cook, and Dayot 2017; Shelton and Lodato 2019; Waal and Dignum 2017), and calls to enable urban citizens to become appropriately 'smart' are now common. Accordingly, a number of studies have examined what Shelton and Lodato (2019) call "actually existing smart citizens" in a range of cities (see for example Calzada 2018; Capdevila and Zarlenga 2015; Cardullo and Kitchin 2018a, 2018b; Granier and Kudo 2016; Ho 2016; Cowley, Joss, and Dayot 2017). Although some have reported otherwise (see for example Zandbergen and Uitermark 2019; Pollio 2016), most studies have concluded that the 'smart citizen' is just another aspect of the neoliberal smart city, participating in the smart city only through individualistic entrepeneurialism or consumerist choice (Cardullo and Kitchin 2018a, 2018b; Kitchin 2014; Shelton and Lodato 2019; Ho 2016; Wiig 2016).

The smart citizen is not the only reconfiguration of the relations within and between people in the smart city, however. The paper argues that particular understandings of the social are also central to how smart cities are being brought into existence. That is, as well as smart individuals, smart groupings of various kinds are also part of how smart cities are imagined. This claim is based on a large number of interviews with a wide range of actors involved in a number of different smart city projects in the UK city of Milton Keynes (MK), as well as some policy documentation. None of this material mentions the 'smart citizen'. Instead, what can be heard in these discussions of smart city activities are accounts of a smart city full of groupings of many kinds, with different sorts of relations between them. This paper explores these understandings of smart sociality.

This paper's first contribution is therefore to demonstrate that the social remains an important and productive category in smart city discourse; the social is not "the invisible periphery of a technological discourse" (Vanolo 2014, 892) in smart cities but remains central to it. Its second contribution is to describe the three different constitutions of the social at work in MK, which it labels *sociological, neoliberal* and *cybernetic*. Finally, the paper suggests that critical smart city scholarship would find firmer purchase in actually-existing smart cities if it recognised the diversity of actually-existing accounts of smart sociality. There is a strong tendency in the critical literature to call for 'bottom-up' initiatives to challenge 'top-down' neoliberalisms (Calzada 2018; Cardullo and Kitchin 2018a, 2018b;

Greenfield 2014; McFarlane and Söderström 2017). This critique relies on a particular and longstanding understanding of sociality and social agency, however. It assumes self-reflexive human subjects who are able to calculate their best interests in situations of structural inequality, to collaborate collectively and to resist powerful governments and corporations. These subjects, groupings and relations certainly exist (see for example Lynch 2019; Pollio 2016). But not all human life in smart cities is organised in that particular way. As the work of Gabrys (2014) and Zandbergen and Uitermark (2019) demonstrates, other forms of inventive, digital subjects and practices are also at play in smart cities, configuring selves and collectives in other ways. The third contribution of this paper is therefore to insist that critics of the smart city require a more capacious critical vocabulary if we are to engage with the full implications of the smart city (and its close cousin, platform urbanism, and indeed their progeny [see also Leszczynski 2019a]).

The paper begins by describing its case study and methods. It then describes three forms of smart sociality in MK smart city talk – sociological, neoliberal and cybernetic – in some detail. The paper concludes by suggesting that much smart city scholarship is confident in its *sociological* critique of the smart city and its *neoliberalisms*. However, more critical attention needs to be paid to the *cybernetic* as a form of sociality, which is pervasive in MK smart city discourse but has been given relatively little attention by smart city scholarship to date.

2 the case study: Milton Keynes

The case study approach of this paper acknowledges the importance of thinking not so much about 'the' smart city but from "actually existing smart cities" (Shelton, Zook, and Wiig 2014; and see Ho, 2016; Karvonen et al., 2018; Taylor Buck and While, 2017). It draws on data from a two-year research project in Milton Keynes (MK). Half way between London and Birmingham, MK is the last of the UK's post-war new towns. It was incorporated in 1968 and now has a population of approximately 260,000. It is one of the UK's leading smart cities, with a wide range of ongoing smart projects. While the first mention of 'smart' in MK appears to be in a council transport strategy review in 2007, the development of MK as a smart city began around 2012, led by the council's Director of Strategy. He describes his strategy as one that brings smart city projects into the city to test things out:

> often enterprises, organisations that were innovating and developing new approaches needed to do that somewhere and that gave me a bit of insight into something that has stood as well over time, which is thinking about our place as a place which can be welcoming and supportive and attractive and enticing for those sorts of projects.

MK is therefore an example of the urban laboratory model of a smart city (Karvonen and van Heur 2014; Karvonen 2016). There is no city control centre and no oversight of smart activities by a council committee. Rather, smart in MK is "organic", to quote the Director, "a living urban laboratory" (MK Council and Snelson 2012, 3) formed of whatever projects can be persuaded to land in, or emerge from, the city (cf Cowley and Caprotti, 2018; Taylor Buck and While, 2017).

This strategy has produced a number of successful bids for smart city projects. Examples include an £8 million grant for the deployment of charging infrastructure for

electric vehicles, a £13 million smart grids trial and £150 million for a transport innovation centre, the Transport Systems Catapult (TSC). Another project, MK:Smart, was funded by the Higher Education Funding Council for England between 2014-2017. MK:Smart was led by computer scientists at The Open University with a number of partners: Milton Keynes Council, two other universities (Cambridge and Bedfordshire), water and electricity companies and ICT providers (BT, Samsung, Huawei, Tech Mahindra). The consortium was awarded £8 million, and match funding commitments resulted in an overall programme value of £16.7 million (see Valdez, Cook, and Potter 2018). Both the TSC and MK:Smart facilitated many smaller projects, often in partnership with other funders. As a result, MK is a smart city full of relatively short-term projects with significant amounts of public and civic as well as corporate involvement, and with a wide range of smart stakeholders including charities, voluntary sector organisations and local campaigners as well as MK:Smart and TSC partners.

The research project therefore entered a complex domain of organisations and technologies. After an initial review of smart activity in the city, five particularly significant and diverse case study projects were identified: an open-access data hub and a digital startup incubator, both part of MK:Smart; a community energy platform startup; a cluster of apps designed with local people's participation; and the TSC's trials of autonomous vehicles. Key actors in all these activites were interviewed in order to understand how these smart projects had emerged and developed. In total, 58 semi-structured interviews were conducted. Interviewees included several officials at MK Council who had responsibility for various smart projects, from the Director of Strategy to a part-time arts and heritage staffer; employees, trustees and volunteers at a range of local community organisations involved in the case study projects; several members of the MK:Smart team, including academics and a knowledge exchange facilitator; nine local residents who had become involved in designing smart technologies; a number of managers at the TSC; as well as the managing or marketing directors of three local tech companies who had been employed on the case study projects. The interviews were recorded, transcribed and coded using NVivo software. The project also looked for documentation in relation to MK Council's smart city policy. However, the Council's smart city policy is held together in large part by its Director of Strategy, emerging, as noted above, 'organically'. While some documentation about related city activities is available (eg its transport and low carbon living policies), as are three documents bidding for smart funding, there are very few written documents directly discussing 'smart'. Hence the project relied heavily on interviews for its analysis. This is not inappropriate, however. The interviews were rich and nuanced, and often acknowledged complications, conflicts and failures in ways that policy documentation or corporate reports seldom do.

Moreover, as smart city researchers are well aware, corporations, startups, thought leaders, researchers, policy makers, elected representatives and campaigners are all actively and necessarily involved in "storytelling" about smart cities which "shapes the imaginaries and practices of a myriad of actors concretely building the city through particular case studies or pilot projects, decisions and everyday action" (Söderström, Paasche, and Klauser 2014, 307; and see Datta 2018; Gabrys 2014; Waal and Dignum 2017). Of particular relevance to this paper are the imaginaries and practices of sociality expressed in the interviews. Latour notes that all social groupings are constituted in part by "spokespersons"; there are no groupings without "a rather large retinue of group makers, group talkers, and

group holders" (Latour 2007, 32). Descriptions, claims, assumptions and evidence about social groupings by their spokespersons produce the social world that they purport to describe; group talkers are also group makers. Analysis of the transcribed interviews and relevant documentation proceeded on this assumption, focussing on and differentiating between accounts of things emerging, holding together, falling apart, connecting, and so on. Based on that analysis, the paper explores how MK's smart city spokespersons describe people grouping together (or failing to do so), and relations between groups (or their absence). This is what it describes as smart sociality, and the next section describes three ways in which it is assumed in MK.

3 narrating the social in smart MK

Analysis of the interviews and documents suggest that MK's smart city spokespersons assume three forms of sociality. These three forms of groupings and relations are not entirely distinct. Their forms may overlap, and the same interviewee may assume more than one of them as they describe their smart city activity. Nonetheless, they assume different kinds of groupings, different processes of group formation and different kinds of relations between groups. The paper describes these three as *sociological, neoliberal* and *cybernetic* forms of sociality.

3.1 sociological accounts of the social

The first of these discursive constitutions of smart sociality is described here as *sociological* because it (loosely) evokes the "sociological imagination" described by C. Wright Mills (1959). For Mills, the purpose of sociology was to understand the underlying institutional and political structures which shape and differentiate everyday lives. The sociological understanding of smart sociality also assumes that it is social structures and relations which account for both the formation of social groups and their relations.

More specifically, this version of smart sociality assumes a structural divide between, on the one hand, the powerful – usually characterised as smart city technology and/or its designers – and on the other, 'the people' – broadly conceived. For example, a software developer said:

> There's a lot of very funky, 'Isn't this cool to talk about?' shit going on. So, you've got the driverless cars and you've got the – sorry, you've got all of that going on. I don't see any of it being fed back to real people in any way whatsoever.

This criticism was repeated by a local academic:

> Smart cities is about bringing vitality and fullness across the whole range of income strands and professions and trades, etcetera. And I think the city has become kind of so focussed on the glitzy bit that I think we've perhaps overlooked the fact that the whole remit of smart cities is to benefit the citizens of the city across the piece.

Other talk specified particular 'real people' or 'citizens' who were unlikely to be engaged in smart activities: those living with "fuel poverty", for example, and those in "the pockets of poverty and social deprivation that there are in an otherwise very affluent city". A long-time local community energy campaigner also lamented the lack of integration of the community energy platform with "the people". She blamed what she called "lots of hugely capable big

boys with very fine brains sitting at Oxford in offices" who were "totally disconnected from any proper strategic thought for the people who might actually be growing and developing businesses in the city".

These spokespersons are describing a specific relation between two groupings: real people/citizens/local businesses, who are being ignored by the smart/funky glitz/big boys. These accounts can be described as sociological because a structural relation is being described between the two groupings.

3.2 the social as neoliberal groupings

Sociological accounts of the smart city were rare. Far more common was talk that assumed lots of different kinds of groupings in the city. These groupings were labelled in many ways, including: stakeholders, partners, agencies, individuals, audiences, citizens, residents, businesses, old communities, landlords, the public, people, users, new communities, occupants, population, groups (including faith groups, sports groups, minority groups, community groups, energy groups), the voluntary sector, [housing] estates, "the car parking fraternity", commuters, consumers, "the layman", campaigner, people in multiple occupancy housing, customers, teenagers, families, resident associations, "the more technically savvy". Spokespersons gave these groupings similar characteristics to the individuals constituted by neoliberalisms. Neoliberalisms depend on a form of subjectivity that takes "the human subject as an autonomous, individualised, self-directing, decision-making agent" (Bondi 2005, 499). Many smart city actors in MK described social groupings and their relations in terms of those same qualities: as autonomous, self-directed and self-improving. The second form of smart sociality, then, is *neoliberal* sociality.

3.2.1 autonomous groups

There was a persistent sense across the interviews that social groupings were autonomous in that they had a set of innate needs in relation to smart that pre-existed their expression and which could and should be articulated. There was a lot of talk about making sure people "had a voice" and conviction that "communities make a difference by having their voices heard". The chair of a voluntary sector organisation talked about the need for data in order to "evidence the need" in various city neighbourhoods slated for regeneration:

> the data element is particularly important because if it comes with a learning program for supporting community members to understand what the data is saying and translating that into arguments they can use for the regeneration program taking a certain direction or… you know, they need to be able to evidence what it is that they need and be able to challenge the people who are in charge of the program and having good, sound, rational, logical arguments for how that works. So, that data is important.

There is an acknowledgement here that 'community members' may need support to work with data (which in some talk was inflected by sociological accounts of those excluded from smart activity) – but once they have that support, the assumption is that the data will allow them to influence or even challenge redevelopment plans by 'evidencing what it is that they need' and making 'arguments for a certain direction'. Indeed, some spokespersons assumed not only that groupings should be able to articulate their needs but that they had a responsibility to do so. The council officers involved in the community energy platform project put the onus on "users" to self-organise to benefit from the platform:

> It's not prescriptive in that it's not really for the Council to say, "You must do this, you must do that," it's really for the wider community to produce offerings or say, "We want our particular area," whether that's districts within Milton Keynes or neighbours even, to say, "We're interested in," for the sake of argument, "banding together to put photovoltaic panels on our roofs…"

The assumption that groupings – such as "the wider community" – were defined by innate needs which not only could but should be articulated echoes the autonomy expected of neoliberal subjects.

3.2.2 groups as self-directed users

Smart talk about these neoliberal groupings also assumes that social groupings are produced by what people do: in the case of the smart city, groups emerge by interacting with technology. Several designers of apps and platforms thought of the users of their apps as a grouping. So the marketing manager of visualisation studio talking about a 3D model of a building that would serve as a repository of data for that building made the builder, the landlord and the tenant/owner equivalent because "it's about loading up the metadata into that model." The designer of a breastfeeding app said she wanted to create it "for everybody" who breastfeeds, and insisted that an app gave equal access to information and support:

> Tell the mum to Google breastfeeding positions and it's there on her phone. I deal with teenage mums. I deal with mums who maybe have addictions or whatever, you know, all sorts of social issues and challenges. And they struggle, but nearly every single one of them will have a smartphone.

In relation to a local heritage app, its council lead remarked that "it doesn't seem to matter who we aimed it at. There's an awful lot of elderly people on their own out doing it, walking and doing it and there are an awful lot of families," and its designer elaborated:

> there have been a lot of people using it and, actually, when you see the types that are using it, it's so varied. You've got families of three or four. You've got adults on their own. You've got teenagers. You've got friends that are young. You've got older people, as well, have been using it a lot […] we were very, very surprised to see such a varied range of people, which, for us, is fantastic. It's really nice to see that we've got so many different types, and so many different individuals, and families, and age groups, and ethnicities, and everything, that have downloaded and used the app.

And one of the entrepeneurs behind the community energy platform described it as "a platform capable of social aggregation" because it brought together anyone with a desire for cheap renewable energy technology.

The same assumption that groupings are made by people doing the same thing was also obvious when discussing questions of mobility. For smart stakeholders interested in transport, the different causes of a lack of mobility were not relevant to understanding the role that smart tech could play in improving mobility and access. For example, a manager at the Transport Systems Catapult said that driverless cars are for anyone who cannot "get the last mile" for whatever reason: "ageing", "people who come and park outside the city", "people who can't drive", anyone "who can't easily get that last mile".

Smart social groupings, then, according to their spokespersons, are autonomous because they know their needs prior to their expression; and they are self-directed because they emerge not from social structures (as spokespersons of the sociological would have it) but from their actions as users of smart technologies.

3.2.3 groups self-improve

The third way in which their spokespersons constitute smart city groupings as neoliberal is when it is acknowledged that "skills and competencies [are] needed to participate in the creation of a smart city" (Milton Keynes Council 2013, volume 2:39). This echoes the expectation in neoliberal ideologies that individuals must shoulder the necessary responsibility of constantly self-improving.

The paper has already noted the chair of a city voluntary sector organisation saying that the "data element" of a smart project should be accompanied by a "learning programme" so that "community members" can understand it and use it as evidence to support their own needs. Generally, though, the provision of education and learning about smart is to enable participation in smart on its own terms (Cardullo and Kitchin 2018a). The same person talked about the need:

> to connect people who live here with some of the technological advances that we don't understand as, you know, as people who work in voluntary organisations and as residents, the scale and pace the galloping of technological advance is not something that we, you know, we don't really understand it but we know that we need to be along on the journey and to try and understand it.

A similar emphasis on learning to keep up (in this case with smartphone apps) was expressed by a community organiser working with older people on a TSC project:

> for those people who aren't as familiar, and these symbols and, like, really basic symbols and imagery, there might be a need to educate them to make it a simple, summary guide. Things that we can do fairly easy to instil a bit more confidence in them to say, 'Right, this is what the heart actually means.' 'Oh, yeah, now it makes sense.'

One of the people involved in the production of the local heritage app assumed that learning about the city's past would encourage groupings described as "people" and "the young generation" to engage with the city's future development:

> that thing about if you're going to get people engaged and get the younger generation interested in this town and why it is the way it is and how and in the future of, you know, continuing to build it. It's only 50 years old, there's a lot of development to happen yet, that we were kind of quite keen on that story as well that actually, it's a way of really learning about the long and the short heritage.

Learning by using the app will enhance the ability of a "generation" to engage in the city in the future. MK:Smart had a strong emphasis on learning too. One of its flagship projects was an open data hub, co-designed by data scientists at The Open University and BT and accompanied by a series of workshops to enable its use by local entrepeneurs established with Horizon2020 funding. MK:Smart also ran workshops in schools on topics like app design, and sponsored the production of a Massive Open Online Course on smart cities. The

emphasis in all this pedagogic activity was on potential users learning about smart and thus becoming able to participate in smart city activities.

To summarise this subsection on neoliberal smart sociality, many descriptions by smart city actors in MK assumed that the emergence of, and relations between, social groupings were characterised by qualities ascribed to the neoliberal subject. Like the neoliberal subject, these groupings have needs that pre-exist their articulation. They have the responsibility for expressing those needs. And they are obliged to skill up (through different kinds of learning) to ensure that they can (continue to) express them in the smart city of the future. Groupings form as these things are done. This means that groupings are emergent, always in "chronic production" (Lash 2007, 56). It also means that the structural relations between groups described by the spokespersons for the sociological form of smart sociality are erased. An example of this is the council officers involved in the community energy platform project quoted at the end of the previous subsection, who went on to say:

> And vice versa, suppliers could ask for residents of Milton Keynes to put together a number of their neighbours or other people in the community to come up with a basket of product, shall we say, to get the prices down. This is the key point of [the project], is that it can act as a catalyst to generate low carbon projects at a price that is competitive for the users.

Here, 'users' refers both to residents buying technology and to suppliers selling it; they are made equivalent ("vice versa") because both are seen as benefiting in the same way from project, by creating a market for solar energy technology. That is, because both are users of the platform, an equivalence is established between what, in the sociological imagination, would be seen as two structurally different social groupings. This neoliberal version of the social understands relations between groups not as structural but as the consequence of different needs, actions and learning.

3.3 the social as cybernetic

The third form of smart sociality articulated by spokespersons in MK is what the paper – again rather loosely – calls *cybernetic*. Spokespersons for cybernetic sociality theorise it in terms of informational feedback loops. The previous subsection noted that smart neoliberal sociality assumes that social groupings have innate needs, even if these need constant upskilling in order to keep pace with change. For the spokespersons of cybernetic sociality, nothing about social groupings is innate. Cybernetic smart sociality is closer to what Deleuze (1992) termed "societies of control". In societies of control, social groupings are constituted through constantly mediated data and social relations take the form of "'curating' a networked terrain within which action is nurtured" (Krivý 2016, 19). Krivý (2016) however suggests that the source of such an account of the urban is less Deleuze and more second-generation cybernetic theory; hence this paper's description of this third form of smart sociality as 'cybernetic' (and see also Zandbergen and Uitermark [2019] on cybernetic citizenship). Certainly much of MK's smart city talk is saturated with the assumption that sociality is constituted by the flow of data (and information).

The lead designer of the MK:Smart open data hub used the notion of "flow" to invoke informational feedback. This spokesperson described the hub in terms that should now be familiar: as accessible to "willing' and proactive users who can use the data for their own ends:

> the platform itself is free, so it's open. So, if you're kind of willing to go through it, you don't need to contact us. You go there, you create your own account, you create your dataset, you put data […] The things that you can take and reuse. For example, for journalism or for making decisions by local businesses and so forth.

After describing his various technical efforts to make the hub as easy to access as possible – for example, by increasing the number of searches that could happen simultaneously – he expanded on his vision for the hub. What he wanted was that its users would also upload their own data so that "sharing will be part of the flow".

His use of the term "the flow" typifies a widespread assumption in MK that what happens – or what should happen – in a smart city is the efficient transfer of data or information. Ideally, in a smart city "everything works seamlessly". For the marketing manager of a local visualisation SME, accessing data appropriate to needs was a right:

> You should be able to go on [to a data repository] and find out where is your dust cart or whatever you call them, bin lorries. And you should be able to go in and see how many people are in the swimming pool that you want to go to.

He described the entire point of his company's data visualisation work as making "the data quite interesting" so as to make it usable. An app developer remarked, "to fix the things, the Council have to know about them, so us doing it in a vacuum is – doesn't work"; similarly, a community organiser said organisations like hers had "actual intelligence about what was going on out there" which should inform smart projects. This flow of data is also assumed in quite banal phrases – "we need to get this information out to people" – and in talk about "raising awareness" about smart activities and of "driving users towards" platforms and apps and "getting users loaded on", as well as in discussion about "the campaigns or the information we need to break the barriers down". For these spokespersons, social groupings are less important than the relationality that emerges as data flows.

The need for data to flow unimpeded is at the heart of the idea of the smart city. It underpins extensive work on smart city data standardisation, for example (Joss, Cook, and Dayot 2017; Schindler and Marvin 2018). More broadly, the characterisation of data as something that should flow is part of what Munster calls "our contemporary connectionist imaginary" (2013: 1; see also Rose, 2018). For Dourish and Mazmanian (2013, 100), cybernetic sociality's spokespersons are an example of how "information flows, models of data processing, and computational command-and-control serve as cultural logics for understanding and narrating the world around us". The use of digital exemplars for understanding social activity in MK was explicit in an interview with a software engineer of the community energy platform. Describing what he had been commissioned to design, he said:

> as an IT engineer we just thought of okay, he is looking for some kind of eBay […] In eBay you can become supplier, in eBay you can become a consumer, like a lot of things, and when you form a – when they talked about group, so we thought of, okay, group is like Facebook. I can create a group in Facebook, and also, I can create a group.

The community energy platform was being interpreted as a version of eBay and Facebook.

To understand precisely what form of sociality is at work here, it is important to remember that Facebook does the social in a particular way: "distributed methods of digital surveillance… fed back through big data sorting that is designed to collate seemingly unrelated sets with the intention of producing novel relations" (Clough 2018, 107). This is a "postsystem" social (Clough 2018, xxiv), and it can be heard in MK's smart city discourse when the city is decribed as being held together by the networked transfer of data, indeed as being little more than the responsiveness to data. The city councillor responsible for business growth and inward investment said:

> smart cities will always learn and evolve and smart cities really represents cities as an organic institute really. It is evolving, it is living, and can respond. One bit of the city can respond to something else in an intelligent way happening in another part of that city.

And there were other descriptions of the entire city as datafied. A community organiser said, "all our groups that are on our database, are from the whole borough, aren't they? They're from every, every, you know [laughing], every corner of Milton Keynes". A TSC manager described "the community as a data source" and the marketing manager of a visualisation company involved in designing an app showing different locations for investing in MK said "I want this 3D map to hold all of the information about almost everything in Milton Keynes".

This vision of a city emerging from data and its flows is accompanied by a similar emphasis on the flows of information through human networks. There was a lot of discussion in the interviews about the very complex webs of local organisations, contacts, conversations and friendships which underpinned smart activity in the city. A community organiser said that "the people that I worked with on MK:Smart, I would contact about another initiative […] all these different things that are happening". A transport researcher emphasised that "there's a relationship with [the Director of Strategy] and the council". One campaigner took her efforts forward because she "had a friend whose son works for a [software] company in London" and the son came to meetings with her. More generally, there was an extensive vocabulary of partnerships, meetings, sharing, balancing different views, interactions, multiple 'stakeholders', the need to meet to negotiate, conversations, discussions, compromises, communication, outreach, doorknocking, dissemination, raising awareness, uploading, access, usage, targeting, making connections, getting feedback, 'having a say', accountability and representation. If MK is an "organic" smart city, this extensive vocabulary frames information and data circulation as its lifeblood.

In this "intensive regime of communications" (Lash 2007, 56), the cybernetic social emerges as the process of information transfer, whether of data, as learning, or in conversation. So it was used on occasion to explicitly reject a version of MK inhabited by the differentiated groups implicit in the sociological version of smart. One of the entrepeneurs behind the community energy platform, for example, described his project as "like a little Switzerland" because its development allowed what he called the "warring factions" in the city to come together; the platform was a device that could overcome differences because the innovators were "friends" with everyone. While on the one hand this is a fine example of entrepeneurial rhetoric, on the other it articulates the understanding of sociality which is dominant in this sort of MK smart city talk: communication holds things together, dissolves

some relations ('factions') and as it momentarily holds others together ('a little Switzerland') just for the duration of its flow.

The cybernetic imagination does produce one significant grouping, however: those who are not part of the flow. Older people are mentioned quite often in MK smart city talk not only because the city has a rapidly ageing population but also because older people are understood as being less able to join the flow. In several interviews, older people are given particular qualities: often feminised, described as technologically incompetent, often relatively immobile. This can be framed as a problem that can be fixed by self-improvement – by learning about the tech – in the neoliberal account. But in the cybernetic account, this grouping's disconnection from the flow will be fixed simply when it can access data – according to the designer of an app intended to make the centre of MK more accessible for older residents by giving them more information about it, for example.

This cybernetic account of smart sociality as generated by the circulation of data echoes a vision of digital technologies as friction-free networks; data is "undulatory, in orbit, in a continuous network" (Deleuze 1992, 6). Krivý's (2016) account of the cybernetic smart city pictures a city saturated with data-generating sensors, where algorithms modulate that data and where such modulated data then feeds back into those sensors' actions. In this account, humans are just one among many sensors embedded in algorithmic feedback circuits (and see Thrift 2014; Ho 2016). Actually-existing MK is nowhere near that vision. Smart modulation in MK is probably only partially materialised in the autonomous vehicle trials run by the TSC in which both cars and people are learning to travel with each other. This pervasive talk about data flow, however, is reminiscent of Gabrys's (2014) discussion of smart citizenship (which Krivý [2016] describes as cybernetic). Gabrys explores the notion of smart citizenship articulated in a smart city design proposal and suggests that their production of digital data produces smart citizens as "ambividuals": individual citizen-subjects whose emergence is contingent on events, articulated through the technologies and practices of computational urbanism. Citizenship, she suggests, can thus become less an individualised subjectivity and more a digitally-mediated distribution. Or, a flow.

Cybernetic sociality, then, is the third form of sociality present in smart city talk in MK. It is emergent entirely through data transfer. In its lack of a sense of social structure or of self-improving autonomy, it is distinct from both sociological and neoliberal accounts of smart groupings and their relations. Its groupings and relations are patterns in (and outside of) flows of ubiquitous information.

4 conclusion: reconfiguring urban sociality, reconfiguring urban theory?

This paper began with the many studies that describe smart cities as part of the neoliberalisation of urban life which is shifting cities towards technocratic, marketised forms of governance and self-directed forms of neoliberal citizenship. Like those discussions of smart citizenship, its interest is in how smart cities are "redefining and reconfiguring relations within and between people, their community, government and the urban environment" (Ho 2016, 3103). Based on a large number of conversations with a range of actors in a different kinds of smart city projects, its main argument has been that there are powerful and productive accounts of sociality also operative in smart cities. One of these

closely parallels descriptions of the neoliberal subject. The neoliberal account of smart sociality understands groupings as autonomous, self-directed and self-improving. However, the paper has argued that MK also hosts other discourses about smart socialities, which it characterised as sociological and cybernetic. While the sociological account understands smart sociality in terms of structural relations, the cybernetic account constitutes groupings in the smart city as constantly configured by the circulation of data and information. These three forms of sociality are not entirely distinct. Sociological accounts of smart sociality can overlap with neoliberal accounts of sociality when it is suggested that education can enable innate needs to be voiced, for example; both neoliberal and cybernetic forms of sociality lack a sense of structural exclusion; though lack of access to data can constitute a grouping unable to participate in cybernetic sociality. Nonetheless, each has a different sense of the ontology of social groupings: as structural, as behavioural and as flow.

As well as describing how different socialities are convened by smart spokespersons in MK, these different accounts of smart sociality align with different theoretical accounts of the social. The sociological story about smart sociality is mobilised by long-serving community organisers in MK but also by the small number of social scientists involved in MK:Smart. In a more overtly political-economy version, it is also the story told by much scholarship in urban studies which criticises smart cities, as the introduction to this paper noted (see for example Cardullo and Kitchin 2018a; Greenfield 2013; Grossi and Pianezzi 2017; Hollands 2008; Kitchin 2014; Pollio 2016; Sadowski and Pasquale 2015; Vanolo 2014). This account of the social as formed of structural groupings and power relations sustained through interests, ideology and discourse is widespread across the social sciences, of course (Lash 2007; Clough 2018).

This sociological account of smart sociality is valuable. As the introduction to this paper noted, various collectives are at work in many smart cities, re-reconfiguring the smart city by challenging its technological and institutional exclusion of the people from smart government. But it is important to understand that this critique also assumes particular forms of individual and collective human agency and relations. It retains a faith in human agency and human resistance. In the context of cities increasingly mediated by digital technologies, it might be suggested that this critique – like much of the social sciences – has "doubled down on the human phenomenological project – on slowness, the bounded body, and the human figure" (Clough 2018, 97; and see Rose 2017). This begs the question raised by Clough's (2018, 97) account of what she calls "the performativity of the datalogical" and what this paper has decribed as cybernetic smart sociality: is this doubling down sufficient to understand the reconfiguration of relations within and between people in smart cities?

This is not an abstract question. For in the rather ordinary city of MK, cybernetic sociality appears deeply embedded. Although it is certainly the least evident empirically in smart city projects in MK, it is the most pervasive in talk about smart activity in the city. The specifically algorithmic feedback circuits described by Krivý (2016) are not widely in evidence in MK smart city projects, but talk about MK as a smart city resonates with notions of circulating data and with the sense that social groupings emerge momentarily through that circulation rather than cause it. What seems to be happening here is a 'cultural logic' in which the dynamics of a society of control are anticipated in everyday talk about smart city activity.

This account of a new form of cybernetic urban sociality is taken to an extreme in Thrift's description of the vitality of data-saturated cities: "cities are full of a whole new layer of emergent entities which, because they are underpinned by code using data as fuel, might be thought of as akin to sentient beings, in that they are able to produce some level of transference through correlation and measurement" (Thrift 2014, 8). This vision of a sentient city given life by digital emergent entities is unlikely ever to be fully realised. There will always be frictions, contradictions and other forms of sociality (Clough 2018; Gabrys 2014; Ho 2016; Rose 2016; Leszczynski 2019b). Nonetheless, a significant body of critical theoretical work, from Deleuze to Clough, is now arguing from this 'whole new layer of emergent entities' rather than against it. And the fact that accounts of cybernetic sociality appear not only in the writing of academic theorists but also in the everyday talk of people involved in smart city projects in a medium-sized town in middle England should give us pause. As well as identifying and challenging structural relations of inclusion and exclusion – as we must continue to do (McFarlane and Söderström 2017) – surely we also need tools for understanding the potentials in emergent groupings of the cybernetic.

Clough (2018) and Thrift (2014) both propose that Latour (2007) is the exemplary theoretical account of the contemporary, cybernetic moment, because of his insistence that social entities are not given but are constantly assembled. Both push off from Latour in radical directions, displacing sociological accounts of big data in which the groupings and relations are already known and pointing to the uncertain outcomes of algorithmic digital processes. Clough's engagement with the tradition of feminist technoscience is particularly valuable, as it sensitises her to the diverse potentialities of what might emerge as data circulates. Her analytical attention is given to the different sorts of subjects, collectives and alliances that might congeal in the data flow. These may resemble the "ambient and malleable urban operators that are expressions of computer environments" described by Gabrys in her account of a smart city design proposal (2014, 42–43), or the participants in a project to gather digital data on air pollution in Amsterdam discussed by Zandbergen and Uitermark (2019). While Gabrys conceptualises the Foucauldian disciplining inherent in digital environmentality, Zandbergen and Uitermark (2019, 12) identify an "ad hoc, decentralised and individual" form of data-immersed agency which is appealing and empowering in its non-authoritarian visions of urban life. In these accounts, attention is paid to excess, noise, production, invention, pleasure, speculation, experimentation, failure and even play, as a means of interrogating "those technologies that are presently bringing into human experience what only technology can enable" (Clough 2018, 86). A critical spatial vocabulary to supplement sociological binaries like inclusion/exclusion, top-down/bottom-up and individual/collective is also part of this work: fields and territories (Munster 2013; Rose and Willis 2018), loops and recursion (Krivý 2016), programming and glitch (Gabrys 2014; Leszczynski 2019b).

For Thrift (2014), Lash (2007) and others, what Clough (2018) calls the "datalogical turn" has thrown down a major challenge to the social sciences because it is reconfiguring both the social and ways of knowing it. This paper has argued that urban scholarship on smart cities – and on digitally-mediated urbanism more generally – should be more attentive to cybernetic forms of sociality, both in order to theorise their urban manifestations but also to map them empirically. New forms of social life are emerging, and

surely scholars of the smart city must now critically navigate this emergent urbanism in its cybernetic manifestations as well as its sociological.

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