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The birth of sensory power: How a pandemic made it visible?

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Abstract

Much has been written about data politics in the last decade, which has generated myriad concepts such as 'surveillance capitalism', 'gig economy', 'quantified self', 'algorithmic governmentality', 'data colonialism', 'data subjects' and 'digital citizens'. Yet, it has been difficult to plot these concepts into an historical series to discern specific continuities and discontinuities since the origins of modern power in its three major forms: sovereign, disciplinary and regulatory. This article argues that the coronavirus pandemic in 2020 brought these three forms of power into sharp relief but made particularly visible a fourth form of power that we name 'sensory power', which has been emerging since the 1980s. The article draws on early studies of power by Michel Foucault, subsequent studies on biopower and biopolitics that expanded on them, and studies in the past decade that focused on data produced from apps, devices and platforms. Yet, despite its ambition, the article is inevitably an outline of a much larger project.

Keywords

Sensory power, assemblages, coronavirus, resistance, Foucault, Deleuze

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Introduction

To understand how the coronavirus pandemic is mobilising data practices, we start with an analysis of the forms of power that generate, assemble and organise data. To put it differently, our starting point is not data but forms of power that produce and act upon it. It is through this analysis that we come to propose the dawn of a new form of power that we name sensory power.

Taking a long historical view on the development of modern power – the ways in which the accumulation of subject peoples engenders accumulation of knowledge and enables accumulation of capital – we start with what Foucault recognised as the changing forms of power since the 17th century in the West. We are most familiar with *sovereign* (straddling 17th and 18th centuries), *disciplinary* (straddling 18th and 19th centuries) forms and to some extent *regulatory* forms (straddling 19th and 20th centuries). The differences in how each form is exercised are exemplified in how each governs peoples: sovereign power seeks to extract *obedience*; disciplinary power demands *submission*; and, regulatory power aims to *calibrate* the effects of obedience and submission on the health and wealth of populations.

We shall shortly elaborate on these three forms of power, but the primary aim of this article is to propose a fourth form of power that has not yet been named, at least explicitly, and which we will *not* formally define but instead situate and describe in relation to the other forms. We name it 'sensory power' which, we suggest, straddles the 20th and 21st centuries and perhaps more precisely the period from 1980 to 2020. Its origins can be traced to computational technologies used in UK and US censuses in the 19th century imagined by Charles Babbage ('difference engine'), manufactured

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by Georg Scheutz, and assembled for use by William Farr in the office of the Registrar-General for England to compile vital statistics about populations (Hacking, 1990: 53). Certainly, disciplinary and regulatory forms of power in the 19th century precipitated the development of computational technologies. By the 20th century these became the information technologies that facilitated the development of military, governmental and corporate networks, which by the 21st century took the form of personal networks through the internet. It is this personalised, miniaturised and distributed computing since the 1980s, and apps, devices and platforms especially since the 1990s, that facilitated tracking and tracing technologies and spawned the logic of platforms for data-based services. From military, finance, hospitality and transportation to health, all sectors have come to depend on data that tracks and traces people in their movements, sentiments, needs and desires. However, the sensors that make up these technologies and the data they generate have engendered not only new ways of accumulation of capital but also the accumulation of subject peoples. By sensors we mean different technologies of detecting, identifying and making people sense-able through various forms of digitised data (text, number, image, sound, signal and so on) about their conduct such as transactions, movements, searches, clicks, and so on. It is through relations with such sensors – whether fitness apps, music streaming services or location-aware devices – that people are subjectified and come into being as subject peoples. It is through the proliferation of sensors in almost all parts of lives that subject peoples have been formed. The birth of sensory power, therefore, does not only signal new technologies of accumulating capital and subject peoples but also how new ways of life are being brought into being.

The question that concerns us is whether the novel coronavirus pandemic has made this new form of power visible and articulable in the early 21st century. That is, while sensors in forms described above have been proliferating since the 1980s, it is under the conditions of the pandemic that the form of power they constitute has become clearly or readily evident and perceptible. We argue that the tracking and tracing of infections, movements, contacts and so on are expressions of this new form of power. While there have been critiques of tracking and tracing from various perspectives such as those concerned with privacy, surveillance and dispossession (Couldry and Mejias, 2019; Lyon, 2018; Zuboff, 2019), we hope that studying this new form of power within a longer historical perspective will enable us to identify forms of resistance that it may elicit.

We have been working over the past few years on understanding this new form of power (Bigo et al., 2019; Isin and Ruppert, 2019, 2020). This is a work-in-progress and our language has been changing along with our thoughts. The responses of international and national authorities (governmental, corporate, organisational) to the coronavirus pandemic in 2020, however, brought some of our thoughts into sharp relief so much so that, despite its ongoing effects, we are convinced that it is timely to share, however perfunctory, a series of propositions as an outline of this larger project. Before we state our propositions on sensory power, however, we do need to provide a brief overview of sovereign, disciplinary and regulatory forms of power with examples from governmental and corporate responses to the coronavirus pandemic in the present. We then hope to illustrate how the coronavirus pandemic is making a fourth form of power visible and articulable.

Forms of power: Sovereign, disciplinary, regulatory

This brief overview on forms of power is necessary since their periodisation or operations have become major points of disagreement. Foucault's studies in the 1970s (1977a, 1978, 1980) where he understood power as strategies and technologies through which people govern the behaviour of others and selves proved extraordinarily productive (Lemke, 2011). Foucault dramatically expanded the concept of government from states to various sites such as clinics, workhouses, hospitals, armies, prisons, camps, schools, cities and spaces where governing behaviour of others and selves precipitated inventions of strategies and technologies by which it was accomplished (Lemke, 2019). Yet, a generation of scholars has astutely and meticulously highlighted the limits of Foucault's studies on forms of power but their work in turn has neither produced agreement nor robust analytics of power. The overall picture is complex but nevertheless we attempt to encapsulate a version in Table 1, which helped us organise our thoughts by serving as an analytical device. Each row represents a form of power named to capture what is organised in each column and which we briefly elaborate in this article: the strategies and technologies it deploys, knowledges it produces, objects it governs, assemblages it enacts and resistances it elicits.

When we say a *form* of power, we mean a governing logic through which power produces effects. The three forms of power are identified by the name given to their distinct logics: sovereign, disciplinary and regulatory. We use *strategies*, like Foucault, to indicate various actions that are purposive but non-subjective. There are strategies of power in and through which subjects

Table 1. Forms of power appropriate to accumulation of subject peoples and accumulation of capital.

Forms	Origins	Strategies	Technologies	Knowledges	Objects	Assemblages	Resistances
Sovereign	C17th–C18th	Obedience	Containment Cruelty	Cartography Political arithmetic	Territories	Colonies Dominions Nations	Revolt
Disciplinary	C18th–C19th	Submission	Confinement Correction Punishment	Medicine Nosology Psychology Sociology	Bodies	Camps Hospitals Factories Prisons Schools Workhouses	Subversion
Regulatory	C19th–C20th	Calibration	Adjustments	Demography Economics Epidemiology Eugenics Statistics	Populations	Categories Classifications	Evasion
Sensory	C20th–C21st	Performance	Modulation	Computational social sciences Cryptology Data science Web science	Clusters	Apps Devices Platforms	Opacity

The strategies, technologies, knowledges, objects, assemblages and resistances are only examples to illustrate how each form of power functions and elicits resistances.

purposively take positions, but which are not a product of any singular or collective subject. We refer to *technologies*, like Foucault, in a broader sense to include not only devices, computers, services, switches and routers but also ways of organising actions and practices. Strategies and technologies give rise to specific *knowledges* necessary for their exercise and realisation such as those of scientific disciplines (e.g., medicine) and their *objects* of government (e.g., populations). All forms of power are exercised through *assemblages* such as colonies, factories and classifications enacted by relations between technologies, practices, data, methods, agencies, authorities, professions and so on. And finally, while people are subjects *to* power, each form elicits different *resistances* from people as subjects *of* power such as revolt and evasion.

A key insight on these three forms of power is how the 'accumulation of capital' is intertwined with the 'accumulation of subject peoples'. These two phrases expressed in connection with forms of power may surprise some readers but it was Foucault (1977a: 220–221) who insisted that

> the two processes – the accumulation of men [i.e., subject peoples] and the accumulation of capital – cannot be separated; it would not have been possible to solve the problem of the accumulation of [subject peoples] without the growth of an apparatus of production capable of both sustaining them and using them; conversely, the techniques that made the cumulative multiplicity of [peoples] useful accelerated the accumulation of capital.

The accumulation of subject peoples (making multiplicities of peoples useful, healthy and productive) and the accumulation of capital (generating economic, cultural, social capital and transforming them into wealth) also require the accumulation of knowledge (about objects and subjects of power) appropriate to these forms. These relations require, as Foucault (1980) expressed many times, that power functions both negatively (cruelty, threat, fear, dread, torture, despair) and positively (desire, attraction, seduction, fulfilment, hope).

Yet several disagreements with Foucault's studies have emerged on a few key premises. We will list these schematically to indicate that these disagreements now shape how we understand forms of power. The first concerns a claim, which Foucault repeated on several occasions and which some of his most astute interpreters cited in turn. Foucault (1977a) often claimed that sovereign forms of power were always ritual, costly and violent. We think sovereign power is a more pervasive form than Foucault assumed. Its mode of extraction of obedience does not necessarily or always rely on costly and violent forms. There are always various negative and positive repertoires available for its exercise and sovereign power itself has gone through changes over time (a point we elaborate later). Second, Foucault (1977a) often expressed that sovereign powers 'soon fell into disuse and were superseded by a subtle, calculated technology of subjection' (220). This claim was repeated by Gilles Deleuze (1990a, 1990b), who argued that 'disciplinary societies' were giving way to 'control societies'. These claims of

supersession of any form of power are not borne out of our own studies (Isin, 2002). We do not think that forms of power fall into disuse and are simply superseded by new forms. We would rather interpret how new forms of power articulate into existing forms, nestle within them for periods and possibly mutate into new forms. Foucault (1978: 149) sometimes expressed this as a passage from one form of power to another with overlappings, echoes and interactions but the assumption of supersession remained fairly constant. As James Scott (2017) has shown, all forms of power may have existed in incipient and nestled forms since the origins of cities, states and empires as organised polities. There is a limit to focus only on *modern* power since the seventeenth century in Europe while deeper and broader genealogies of power paint a more complex picture. Third, there is an implicit but a key claim in Foucault's studies where modern forms of power, especially modes of subjectification, are symmetrical. This is partly borne out of Foucault's brilliant intervention that power functioned not only negatively but also positively, but which forced his thought to project an image where all actors act on each other's actions on a level playing field. In Foucault's studies, asymmetries – which are themselves also both products and enablers of power relations, such as class, gender and race – played rather ambiguous roles (Stoler, 2016). Lastly, which is partly a consequence of focusing on modern power *in* Europe, Foucault limited himself to 'societies such as ours' while ignoring how 'societies such as ours' were fashioned through domination, dispossession and oppression of 'other societies'. To put it differently, as Walter Mignolo (2003, 2011) vividly illustrated, modernity and coloniality were two aspects of the same development in different forms of power and its neglect is an important limit in Foucault's studies on power (Isin, 2012). Empires experimented on subject peoples with various strategies and technologies of power in colonies that were taken up in the metropole (Mbembe, 2001). We cannot isolate 'societies such as ours' from 'societies such as theirs' and this recognition has substantial implications for studying power.

There is a complicated matter of how Foucault articulated, developed and broadened his studies on forms of power during his lectures that were published posthumously and whether these lectures provide elaborations beyond the published studies. Stuart Elden (2016) and Thomas Lemke (2019) provide detailed accounts of how Foucault's lectures and books coincided or diverged. They offer insights on especially the lectures *Society Must be Defended* (Focult, 2003), *Security, Territory, Population* (Focult, 2007) and *The Birth of Biopolitics* (Focult, 2008). We cannot enter into this complicated matter in the space of this article, but we are uncertain whether these lectures would resolve the four disagreements we noted above. The following sketch is therefore *our* reflections on the three forms of power in order to propose a fourth.

We now want to reflect on the coronavirus pandemic to illustrate how each form of power functions through several strategies and technologies, forms of knowledge and objects of government. We have observed how sovereign power is extracting *obedience* (lockdown, curfew, containment); disciplinary power demanding *submission* (sacrifice, distancing, isolation, punishment, hygiene); and, regulatory power *calibrating* the effects of obedience and submission on the health of populations (infection, transmission, mortality, recovery and immunity rates). Below we elaborate on each of these three forms of power as a segue to our discussion of a fourth form of power that is entwined with but distinct from these three forms in the present.

What is sovereign power? Straddling the 17th and 18th centuries the birth of sovereign power is associated with, on the one hand, the birth of modern empires and, on the other, state apparatuses with which they were governed. In this period, the concern of sovereign power increasingly became the health and wealth of subject peoples. European empires were built by accumulating subject peoples with slavery, colonising indigenous peoples and settling colonies. If each of these movements required extracting obedience from subject peoples, it also precipitated searching for more effective and efficient ways of governing them. If the key objects of government were *territories* governed through technologies of settlement, deportation and dispossession, key forms of knowledge also developed on the wealth and health of subject peoples known as political arithmetic (Petty, 1888). The accumulation of mercantile capital would have been inconceivable without the transatlantic slave trade of African peoples into colonial settlements, subjugation of indigenous peoples and deportations of dangerous peoples by forcing them into becoming settler colonists. If governing metropoles meant subjugating dangerous populations by cruelty it meant governing colonies by mass occupation, displacement and dispossession. As Foucault expressed it, sovereign power is that which 'makes die and lets live' (Gros, 2016). We will see what its reversal meant shortly.

With the effective closing of national borders and mobility restrictions during the coronavirus pandemic we did not witness the 'return' of sovereign power. It has always been there, but its exercise does not require the same technologies of power such as those noted above. Lockdown, curfew, confinement, regulation of movements, border controls and overall restrictions on the mobility of subject peoples are amongst the routinised and institutionalised technologies that sovereign

power developed over a long period. What we have witnessed is the more widespread deployment of sovereign power during the coronavirus pandemic. Austria, New Zealand, or Taiwan may have been identified for acting most swiftly in closing borders and China for shutting down not only external borders but also internal borders by enclosing entire cities. But, let us not forget that both external and internal borders were subjected to immediate controls on all continents though with varying intensities across different states. These are examples of how the exercise of sovereign power has become routinised and tacit and in turn less visible over time and yet ready to be reactivated to extract obedience from subject peoples. While accepted and even supported by dominant groups, and at the same time contested and brutally and cruelly experienced by others such as refugees, borders have become taken-for-granted forms of sovereign power. If the cruelties of borders have not been widely recognised that's perhaps because sovereign power has rendered itself less visible not only in the sense of being perceivable but also because its technologies have become routinised in thought and bodies. We thus ought not to conflate invisibility with inexistence. Nor should we be surprised by the widespread obedience that sovereign power has extracted despite occasional and scattered protests primarily in the United States but also in other countries such as Germany and the UK questioning restrictions on movement mobility. What we have seen during the pandemic is that sovereign power is tangled with other forms of power from which it draws strength, but from which it needs to be analytically separated. Unlike the 17th or 18th century variants, sovereign power in the 21st century could not have functioned without *relying on* disciplinary and regulatory forms of power, which undoubtedly contribute to its invisibility.

What is disciplinary power? From the 18th to 19th centuries we witness the emergence of a new form of power that operates on the body: its discipline, its capacities, its will. The key object is the human *body*. It is true that sovereign power also operated on the human body: cruelties from branding black bodies to spectacles of torture and transportations (i.e., forced displacements) regardless of their fatal consequences were widespread technologies (Browne, 2015). For the accumulation of subject peoples required exercising sovereign power as the right to decide over the life and death of bodies (Foucault, 1978: 135).

Yet, as Foucault (1978: 139) argues, '... starting in the seventeenth century, this power over life evolved in two basic forms; these forms were not antithetical, however; they constituted rather two poles of development linked together by a whole intermediary cluster of relations.' For Foucault disciplinary power was formed first and it was '... centred on the body as a machine: its disciplining, the optimization of its capabilities, the extortion of its forces, the parallel increase of its usefulness and its docility, its integration into systems of efficient and economic controls' (139). This was 'an anatomo-politics of the human body' where optimising the capacities of bodies for production increasingly became a primary concern. It may have started in barracks (soldiers) and on ships (slaves), but disciplinary power gradually produced prominent assemblages where technologies of power and forms of knowledge combined to create optimised bodies for production. Over the next three centuries disciplinary power produced clinics, prisons, hospitals, schools, workhouses, camps, and eventually gyms, shops, studios and other assemblages where forms of knowledge were brought to bear on humans governing themselves.

Just consider how we have collectively become experts in the anatomo-politics of our own bodies during the coronavirus pandemic. We have not only followed daily what medicine has discovered about the virus and its modes of infection, but also have internalised injunctions and admonishments on how to conduct ourselves safely for others. We have been advised to sacrifice everyday activities by isolating in order to save ourselves, others and public health systems. We have developed, in an astonishingly short period of time, new forms of conduct by protecting ourselves and others in physical distancing, covering our faces and regulating our contacts. We have developed astoundingly ritualised hygiene practices of disinfecting ourselves. We have exercised all these forms of submission that disciplinary power calls for as subject peoples concerned with our own and each other's health and safety. If we followed the rules of confinement imposed by sovereign power obediently, we followed the rules of safety called for by disciplinary power submissively. What the pandemic has rendered visible is that we experience these two forms of power simultaneously. We, our bodies, recognised how these two forms of power – sovereign and disciplinary – depend on each other and work together. Under normal circumstances neither form of power is visible. Under the current circumstances they become revealed. Without a hint of irony, for those who needed help, practical guidance was offered on how to relearn socialising after the confinement (BBC, 2020a).

We think that Foucault's focus on Jeremy Bentham's panoptical prison design precisely captures this relationship between sovereign power and disciplinary power, which was governed by punishment: fines, charges, attestations, permissions, and identity cards were mobilised to separate those who were successfully responding to sovereign power by exercising discipline from those who were not. Foucault notices,

however, that disciplinary power slowly comes into relation with another form of power that informs it. It is this third form of power that troubled Foucault in the late-1970s and the subsequent studies on power since. Foucault originally designated it as 'biopower' and its associated exercise as 'biopolitics'. To ease some of this trouble we prefer to call it a regulatory form of power for reasons we briefly explain below.

What is regulatory power? From the 19th to 20th centuries we witness the emergence of a power that is at once totalising and individualising. It is regulatory power

> focused on the species body [population], the body imbued with the mechanics of life and serving as the basis of the biological processes: propagation, births and mortality, the level of health, life expectancy and longevity, with all the conditions that can cause these to vary. Their supervision was affected through an entire series of interventions and *regulatory controls: a biopolitics of the population*. (Foucault, 1978: 139)

Using 'population' as a synonym for 'species' Foucault observes that the emergence of

> ... this great bipolar technology – anatomic and biological, individualizing and specifying, directed toward the performances of the body, with attention to the processes of life – characterized a power whose highest function was perhaps no longer to kill, but to invest life through and through. (139)

This enabled Foucault to see a key relation between disciplinary and regulatory forms of power. Each depends on the other but now disciplinary power functions most effectively as a positive rather than negative force. While Foucault never used this term, we think it is quite appropriate to define this interdependent relationship as calibration. What regulatory power performs is a strategy of calibration: it mobilises the formulation and/or prescription of appropriate forms of conduct for *bodies* that are necessary for, or conducive to, the functioning of a *population's* health and wealth. More importantly, regulatory power calibrates the conduct of bodies with that of a population *not* by admonishing or punishing bodies for non-compliance (though that relationship between sovereign power and disciplinary power continues to function) but by persuading, guiding, nudging and cajoling bodies that their health and wealth derives from it. Bodies discipline themselves as responsible subjects for their own and for common good.

We cannot think of a better illustration than a singular metric that has become a symbol of the current pandemic: the reproduction or R number. As explained by government and media channels, R is the rate by which each body infects other bodies or the virus reproduces itself (Cookson, 2020). If a given body infects three bodies, the reproduction is three times higher than if a body infects only one other body. The logic of calibration here is that if the body in question is identified, sequestered and isolated, its harm to the population is neutralised. One UK government advertisement showed the R-rate with a speedometer-like graphic indicating the-then current rate of infection and admonishing people to 'stay alert to keep R down'. Once epidemiology performs its function to calibrate bodies to populations, medicine can perform its function to cure the individual body and invest in its life. Much was made initially about the concept of herd immunity that would be gained by large numbers of people contracting and then recovering from the coronavirus. What is herd immunity if not essentially the exercise of the sovereign right to decide life and death of peoples especially when it eventually became clear that the elderly, the infirm, the poor, indigent, black and brown bodies most disproportionally lost their lives? If sovereign power 'makes die and lets live,' as we saw above, regulatory power 'makes live and lets die' (Gros, 2016).

To return to the relation between the accumulation of subject peoples and accumulation of capital (or between population health and wealth), we have witnessed a tension during the coronavirus pandemic in terms expressed as the trade-off between health and the economy. When does sovereign power (re)start the economy? What is the trade-off between lives and livelihoods (The Economist, 2020)? If indeed the accumulation of subject peoples engenders accumulation of capital and accumulation of knowledge, an analysis of forms of power must keep all these three processes in view as they are intertwined. Moreover, just as there are different forms of knowledge and subject peoples, capital must also be understood in its different forms (economic, cultural, symbolic) as Pierre Bourdieu (1983) insisted.

This brief overview has overlooked how the overlaps and dynamics between different forms of power function and how each depends on certain aspects of the other in the coronavirus pandemic. Our aim here is to both provide an historically informed overview of forms of power and their simultaneous existence and how the development and articulation of a new form of power has increased their complexity. Many objections will be made about our overview of the three forms of power sketched here. We recognise that questions of power and especially biopower have given rise to disagreements on its functions, effects and transformations (Cisney and Morar, 2015). Especially the concepts of biopolitics and biopower have been

brilliantly expanded by Achille Mbembe (2019), Giorgio Agamben (1998), Ian Hacking (1982, 1990), Michael Hardt and Antonio Negri (2000), Nikolas Rose (2006), Roberto Esposito (2008) and Thomas Lemke (2011). As Paul Rabinow and Nikolas Rose (2016) have recently shown, however, each scholar has taken 'biopolitics' in a particular direction and with mixed results. Rabinow and Rose insist that if biopower and biopolitics must retain their analytical power we must include at least three elements: forms of knowledge about life; strategies that intervene in the name of life; and, modes of subjectification through which people invest in their own lives. Taking simultaneously totalisation and individualisation as their key analytical tool they illustrate how biopower functions by regulating between bodies and populations. This is broadly how we see regulatory power but the terms biopower and biopolitics, beginning with Foucault's sketchy studies, have conflated the relations between sovereign power and disciplinary power and between disciplinary power and regulatory power. As Paul Patton's (2016) analysis shows it is very difficult to imagine how biopolitics intervenes at the level of populations rather than through individual bodies without some mechanisms between the two. Frederic Gros (2016) astutely warns against using Foucault's lectures on biopolitics as conclusive analyses by illustrating that Foucault had shifted his attention to studying broadly rationalities of government.

Yet, just when these studies were published and developments since the 1980s were being interpreted through the analytics of biopower and biopolitics, a fourth form of power may have already been emerging. To put it differently, while studies on modern power have been attempting to plot various new events such as the development of apps, devices and platforms into a genealogical series already named and recognised such as 'algorithmic governmentality', 'computational capitalism', or 'age of algorithms' (see Amoore, 2020; Rouvroy, 2013; Rouvroy and Berns, 2013; Stiegler, 2019, ch. 1, s. 4), a new event may have been unfolding in the present but, like we stated earlier, an event that perhaps remained dimly visible and barely articulable – until the coronavirus pandemic. It appears to us that the task of the present is to attempt to study the fourth form of power historically which in turn will enable us to recursively reinterpret the three forms of power.

The birth of sensory power?

The key development in the exercise of sensory power has been the objects that are enacted between bodies and populations. To us, the birth of sensory power signals that power is not as bipolar as Foucault thought: individualising and specifying, anatomic and biological or molar and molecular. Monitoring the performances of bodies with attention to the processes of life necessitated segmenting populations into what Hacking (2002, 2007) called 'kinds' of peoples. Foucault (1978) had anticipated that disciplinary and regulatory forms of power were 'linked together by a whole intermediary cluster of relations' but he did not specify these intermediary clusters of relations (139). What then are these kinds of relations between bodies and populations? What are the kinds that power assembles? How are populations themselves divided into kinds that function in overlapping and intersectional ways? In terms of relations between regulatory power and disciplinary power the kinds were produced as class, gender and race. But new intermediary clusters may have emerged that were not articulable and visible forty years ago when Foucault, Deleuze and those who followed their work were writing but developments since then and especially in the early months of 2020 suggest that we can identify a new form of power that assembles 'intermediary clusters of relations'. While Foucault did not define clusters, we suggest that *clusters are intermediary objects of government between bodies and populations that a new form of power enacts and governs through sensory assemblages*. To put it differently, we want to suggest that sensory assemblages of which integrated apps, devices and platforms are a part, enact specific objects of government: clusters. Although the term 'clusters' may be thought to have relevance only for the coronavirus pandemic and the epidemiological models and vocabularies that dominate public debates, it is also important to remember that Foucault originally developed his concepts of disciplinary and regulatory forms of power with keen attention to responses to epidemics as a recent compilation has shown (Foucault et al., 2020). In any case, when we refer to clusters, we do so in this broader sense.

Before we discuss clusters as objects of government, however, we will discuss sensory assemblages because they bring clusters into being. Our formulation of sensory assemblages may appear resonant with Deleuze's (1988: 32–41; Deleuze and Guattari 1987: 1837 & 1227) use of Foucault and subsequent developments especially in science and technology studies (Barry, 2006). Paul Patton (2018) already made analytical use of equally sketchy analyses of Deleuze's (1990a, 1990b) societies of control. Leaving aside assumptions that we have already questioned – that societies of discipline were giving way to or were replaced by societies of control or that biopolitics intervenes without intermediary mechanisms – Patton nonetheless makes pertinent observations on how control societies were oriented to technologies of modulating bodies rather than punishing or disciplining them, and in doing so were

creating new assemblages. We argue that new studies on data politics inspired by primarily Foucault and Deleuze began pointing in a rather different direction (Amoore, 2015; Beckman, 2018; Fuller, 2017; Fuller and Goffey, 2012; Galloway, 2006; Galloway and Thacker, 2007; Mackenzie, 2015, 2017). To put it differently, new studies on data politics signify, at least to us, that 'control societies' are more like a continuation of 'disciplinary societies' governed through new technological means such as biometric recognition, automated surveillance, algorithmic government and digital spying. We think that sensory power is a related but a distinct form of power different from what control has come to mean in the phrase 'control societies'.

Obviously, we are not interested in proposing the dawn or age of 'sensory societies'. The difficult task ahead is to take into account these studies on data politics by resignifying them through the analytics of power sketched here, and to then interpret how a fourth form of power is nestled in but became visible amongst the other three forms of power during the coronavirus pandemic. This is no mean feat. We cannot attempt it here with the rigorous analysis it demands. Nonetheless, we offer observations and propositions about how new assemblages of sensory power have been developing and how the pandemic makes them visible.

All forms of power work through assemblages that enact their objects through myriad technologies and relations: sovereign power governs territories through assemblages that enact colonies, dominions, states (cartography, maps, surveyors, borders); disciplinary power governs bodies through assemblages that make up prisons, camps, hospitals, factories, prisons, schools, workhouses (architecture, walls, fences, guards, gates); and regulatory power governs populations through assemblages that enact attributes, categories and classifications such as class, gender and race (administrative records, enumerations). In the same way, as illustrated in Table 1, sensory power governs clusters through new assemblages that make up apps, platforms and devices (software, transmitters, code, protocols).

While sensory power works through sensory assemblages to enact its objects of government, we do not think that this means a new form of power is replacing existing forms but rather is articulating with/in them. Thus, a new form of power is to be found nestled in existing forms but nonetheless mobilising new strategies and technologies. But to articulate what is sensory power we need to first discuss how sensory assemblages produce clusters. In a recent chapter we posed five propositions concerning clusters on the basis of our analysis of imperial censuses and contemporary deployments of Big Data and analytics to govern the postcolony (Isin and Ruppert, 2019). We will still refer to these five but here we exemplify and further develop them in relation to the exercise of power during the coronavirus pandemic. All propositions below apply somewhat to assemblages of sovereign, disciplinary and regulatory forms of power but are central to the strategies of sensory power and how it functions, which becomes clearer, we hope, as each is developed.

Clusters are relational objects. During the coronavirus pandemic, novel objects of government have become visible and articulable. We have seen reference to various entities such as hotspots, epicentres and bubbles (BBC, 2020b; Chan et al., 2020; *Financial Times*, 2020; Mason, 2020). These were of course related to the spread of the coronavirus, but they were meant to indicate how bodies either infected or healthy were related to each other. What made them bubbles, hotspots or epicentres is that these bodies came into contact with a condition (infectious, healthy) that made them an object of interest for government. This interest is not about capturing, punishing, or disciplining these bodies but about identifying and providing the means by which bodies can modulate their behaviour or conduct with desirable outcomes. Modulation is different from the technologies of adjustment of regulatory power, which works through knowledges such as statistics. By contrast, governing clusters involves ongoing and 'live' tracking of their performance through which decisions and interventions can be formulated with immediacy by narrowing the time between identification and action. This difference can be exemplified by considering how gatherings of bodies for celebrations, raves and beach parties elicited new policing concerns about discipline and punishment during the easing of the lockdown in the UK and France in the summer of 2020 (Bland et al., 2020). By contrast, clusters as objects of sensory power do not simply exist as physical gatherings of bodies but are relations that sensory assemblages as relations between 'infectious' or 'healthy' bodies. The sensory assemblages that produce clusters involve relations between human and non-human actors including devices, sensors, platforms, practices, data and methods, and agencies, authorities, technicians and professionals in governments, corporations and non-governmental organisations. While the devices that make up sensory assemblages may not be entirely digital (yet) – as contact tracing programmes involving public health personnel and analogue practices well illustrate – tracking, testing and tracing bodies require frequent gathering, storage and transmission of data by various agents and authorities. Along with lockdown, distancing and isolation, tracking subjects who have been infected, tracing subjects who may have had physical contact with them, and alerting

both clusters to isolate themselves requires exercising technologies of power appropriate to these objectives.

In relation to tracing and tracking apps we have seen how they involve competitive struggles between and amongst states, international organisations and multinational corporations. This is a very different scenario than when states had virtual monopoly of knowledge about their subjects. Now technology companies command such knowledge and intensely compete with each other for hegemony. But the competition is also between various competing professions involving epidemiologists, statisticians, data scientists, programmers, app developers, security experts, methodologists and so on who are transnational and whose expertise traverse national borders. While sensory assemblages may not be entirely digital (yet), they nonetheless involve various combinations of digital technologies such as satellites, data centres, transmitters, receivers, and mobile devices and include analytics such as algorithms, machine learning and cloud computing. Consider, for example, the mobility reports produced by Apple, Google and Facebook. Through global relations between human and non-human actors such as devices, technicians and programmers, they accumulated data about infections and deaths which in turn came to inform their development of a tracking and tracing app toolkit (Apple, 2020; Facebook, 2020; Google, 2020). Here we can see how the tracking and tracing performed by these major technology corporations are by no means limited to disease but related to other forms of conduct such as watching, listening, reading, communicating and so on, and through which people form relations which can be enacted as clusters. While enacting and controlling clusters to maintain the accumulation of subject peoples (health) and accumulation of capital (wealth) has proved an elusive objective, the development of coronavirus apps has made visible a form of power whose object is clusters. That is, clusters are not novel to coronavirus as objects of power but related to sensory assemblages already in operation in several fields of commerce and government.

Clusters are multiple objects. If sensory assemblages propagate, multiply and reproduce clusters how do people become related? Clusters do not merely constitute 'new' representations of 'old' populations. Clusters do not map on to populations of regulatory power mostly compiled for and by national authorities. Within six months the coronavirus traversed borders and reproduced itself across nearly two hundred states despite authorities' closing borders with variable intensities. What is lost in cross-national comparisons is how these states were only marginally able to control the transversal reproduction of the coronavirus. At the same time, so did sensory assemblages spread, multiply, adapt and mutate clusters. To understand this requires seeing how sensory assemblages produce the objects they represent. It is for this reason data can be understood as an agent within sensory assemblages for what they might perform changes depending on dispersed and transversal relations. When data about clusters is brought into being by sensory assemblages of experts, methods, technologies, organisations, practices, authorities, subjects and so on it is never under the strict control or influence of any of them. It is through its circulation and repurposing that sensory assemblages get detached from the authorities that make them up and come to enact and act on objects as well as subjects in myriad ways. It is not only clusters of the infected and those who are contacted by the infected that traverse borders but also different combinations of strategies and technologies, knowledges and all of the actants and actors that constitute multiple clusters (networks, associations, relations) that invariably traverse nation–state borders.

Clusters are fluid objects. Conventional population statistics typically involve sociodemographic categories and then the collection of data through usually self-elicited accounts that use various methods to fit people into categories (Ruppert, 2011). As Hacking (2002, 2007) observed, the making of these categories produced 'rigid new conceptualisations of the human being'. By contrast, sensory assemblages enact clusters based on the performance of bodies rather than imposing categories and classifications in advance. Unlike categories, clusters are generated as a consequence of analytics such as machine learning and algorithms that do not identify associations between existing variables, but explore multi-dimensional patterns amongst 'hundreds and in some cases tens of thousands of variables and sample sizes of millions or billions of data' (Mackenzie, 2015: 434). Differences are not understood as 'variables' as in statistics, but derive from combinations of attributes from different 'forms of data (text, images, video, transactions, sensors), not just the variables measured using classical statistical tabulations of surveys, polls or random sampling' (Mackenzie, 2015: 433). While variables can also be diverse, a key difference from the conventional statistical production of populations is the registering of multiple forms of conduct or what people do such as their movements and actions (transactions, choices, statements, interactions) where the focus of inquiry is not on the individual factors that affect conduct, but on aggregate patterns and connections: contagion, dissemination, influence, association, etc. (Ruppert et al., 2013). It is through the continuous tracing, tracking, monitoring and modulating work of sensory assemblages that produce clusters that are fluid (and dynamic) rather than solid (and static) objects of government. If clusters are rendered

sensible as fluid and dynamic how are they rendered visible?

Clusters are visualised objects. Like sovereign, disciplinary and regulatory forms of power, sensory power works through visualisations. Each form of power has produced its regime of visualisation from cartography to anatomical diagrams and statistical charts, but the visualisation of sensory assemblages has precipitated entirely novel imaginaries and techniques of representation. If Edward Tufte (1983) famously insisted that visualisation can be a technique 'for reasoning about statistical information' (9) that 'reveals data' and can be more 'precise than conventional statistical computations' (13), it was Stephen Few (2006), also famously, who operationalised its logic: dashboards. The millions of data points that make up sensory assemblages have mobilised visualisations as not simply representations but a key technique through which data scientists make data visible, sensible and articulable (Mackenzie, 2015: 437). These visualisations identify unseen patterns and include interactive elements and dashboards that enable seeing the effects of combining different data on features of a population (Bamberger, 2016). We suggest that the 'dashboard' has become a primary technology of government like cartography, anatomy and charts. Their ubiquity for governing cities has been studied (Kitchin et al., 2015; Kitchin and McArdle, 2018; Mattern, 2015). However, for all the seemingly accurate cartographic representations that dominate publicly available visualisations about the coronavirus pandemic such as those showcased on the Johns Hopkins University dashboard, all that they have offered, especially in early 2020, are fairly basic data and statistics mapped onto national borders (Johns Hopkins University, 2020). Similarly, several other dashboards are also rather basic (NHS Providers, 2020; Thorlund et al., 2020; UK, 2020; WHO, 2020). Yet, the sample skilfully compiled by Neel Patel (2020) shows that there is much more being developed in relation to the coronavirus. There are, however, much more sophisticated 'dashboards' such as those for financial systems (markets, transactions), transportation systems (air, rail, sea), military operations and managing football games (Mattern, 2017). There are also rapidly developing dashboards in fields such as migration or policing where dashboards have been deployed for governing movement and criminality (Aradau and Blanke, 2017; Tazzioli, 2018). As Kitchin and McArdle (2018: 113) argue, initially, most city dashboards used traditional data generated in specific periods; over the last few years; however, they came to incorporate data produced in real-time by sensors and devices including data scraped from social media and through crowdsourcing. So, while dashboards on the pandemic remain relatively basic, they are part of a larger series and given the intensive investments by governments, research funders and universities that are underway, they are likely to develop into more sophisticated forms. This brings us to the most important aspect of clusters: they are not only real-time but live. What is the difference?

Clusters are live objects. While real-time data may be presented in dashboards and subjects acted upon through disciplinary or regulatory forms of power, sensory power organises machine learning algorithms so that measurement, identification, action and intervention can happen live and recursively. By live we mean forms of data are mobilised because of their immediacy and which can take on varying intensities and temporalities. However, the multiplicity and fluidity of clusters that makes them live also renders them difficult to control by a singular authority. It is this last aspect of sensory assemblages that brings us closest to what we mean by sensory power. It involves modulating the performance of bodies and populations through governing interventions that rely on technologies of machine learning, algorithms and visualisations of clusters as relations. Rather than the periodic 'stocktaking' of conventional statistics, populations are divided into clusters that are live and have pulses, flows and patterns. Rather than the accuracy and precision of data on numbers infected, contacted, recovered and deceased, it is knowledge of the spread, peaks and troughs of the disease that mobilises governing interventions. In turn, data serves a dual function: for identifying attributes or features that make up clusters (e.g., infected, contacted) but then monitoring and evaluating those features live (e.g., daily changes in R metric hotspots, epicentres, bubbles) thereby provoking changes in conduct (how people govern their movements in relation to hotspots) and sovereign and disciplinary interventions (easing or increasing lockdown). Identifying attributes produces data in much the same way as classical data regimes: populations are periodically measured with indices, rates, metrics and indicators. However, modulation between bodies and populations through clusters enacted by sensory assemblages work continuously with pulses and signals. It is a recursive logic captured in four stages of data analytics: descriptive and exploratory analysis (what is happening, often in real-time); doing predictive analytics ('what is likely to happen'); detection ('tracking who is likely to succeed and who will fail'); and evaluation and data diagnostics ('how to improve programme performance') (Bamberger, 2016: 60–61). What these elements encompass is how the data of sensory power is not separate from but interwoven with sovereign, disciplinary and regulatory strategies. We suggest that during the coronavirus pandemic this

aspect of sensory power has become especially visible and articulable.

We mentioned earlier the emergence of sensory assemblages that bring into being clusters such as hotspots and epicentres (Kitchin, 2020). These have become objects of government especially in the race to develop apps to track and trace the reproduction of the virus and develop interventions such as immunity passports in order to return people to productive labour (Ada Lovelace Institute, 2020). The competitive struggles between national authorities such as in Britain, Germany and France and multinational corporations such as Apple and Google have been reported as struggles over privacy, but these struggles certainly also involve control over data, its storage and access (Bowcott, 2020; Levy, 2020; McGee et al., 2020; Miller and Abboud, 2020; Sabbagh, 2020). Nevertheless, the development of such apps illustrates the birth of sensory power at its most incipient state: live governing of the dynamic relation between bodies and populations through the enactment of clusters.

It is worth briefly dwelling on their logic. The app aims at *tracking* the locations of bodies infected with the virus, *notifying*, *testing* and *isolating* (if necessary) them in order to stop its reproduction, *tracing* all bodies that infected bodies came into contact with, *notifying*, *testing* and *isolating* (if necessary) them as well, and thus *slowing* the reproduction (R-value) of the virus (Warrell and Bradshaw, 2020). Essentially this creates a live cluster of bodies infected or potentially infected by the coronavirus. Governing bodies in clusters, however, requires interventions at the stages of notifying, testing and isolating in order to be effective. Clearly, this is a relation between regulatory power and disciplinary power: to achieve the desired infection rate R, disciplinary technologies of power such as the consent of individuals to agree to be notified and act according to the results whether that involves getting tested or (if necessary) self-isolating. This is a costly and inefficient exercise of power. Yet, the enthusiasm about a potential app and its promise to deliver a game-changer is palpable: to minimise disciplinary power and instead maximise sensory power. In other words, to formulate the problem of government as a relation between regulatory power and sensory power.

Leaving aside the fact that such an app may never function as intended despite numerous attempts – a point to which we will return below – it is worth dwelling further on a potentially successful app (Solomon and Miller, 2020; Warrell et al., 2020). We have noted various stages of the cycle: tracking, notifying, testing, isolating, tracing, notifying, testing and slowing. If solutions were found to automate the testing and isolating stages, essentially multiple, relational, fluid, visualised and live clusters could be *governing themselves*. There are of course technological limits to such a scenario. There are also severe legal, political and cultural limits but such limits may become surmountable if not during the coronavirus pandemic but soon in another field of application where such limits seem less relevant such as in finance or transport logistics.

We thus find it difficult to believe that we could imagine such scenarios without technologies for tracking and tracing peoples being already present in other fields than epidemiology. We mentioned earlier that the accumulation of capital in finance, manufacturing, retail, transportation, hospitality, entertainment and other industries has been accompanied by the accumulation of subject peoples through tracking and tracing their movements and the modulation of sentiments, needs and desires. We have also mentioned finance, policing, crime, migration, borders and education as such fields of government where sensory power is making its appearance. The live data produced from sensory assemblages pervade these sectors and fields. What we are observing through the coronavirus pandemic is the acceleration of strategies and technologies of sensory power that have emerged over the last forty years in these fields.

The resistances that power elicits

Alas, power is a treacherous concept to think with at least since Max Weber (1978: 926–940) attempted to domesticate Friedrich Nietzsche's (1994: 35–67, 2001: 106–153) concept. We think Michel Foucault (1977b) liberated Nietzsche from Weber by historically investigating forms of power (especially since the 17th century in Europe) rather than asking what power *is*. That liberation gave rise to questions not only about how does power function but how then is resistance possible? We pose this question after having first offered five propositions that, taken together, illustrate how sensory power works through assemblages that track, trace and visualise the performance of clusters by enacting them as multiple, relational, fluid, visualised and live objects. We have argued that this signals the birth of sensory power. Here we turn to some thoughts about the limits that this and all other forms of power encounter and the resistances that each elicits. Such limits, as Howard Caygill (2013) says, elicit both misfires and resistances. First, much of what we said about each form of power and its strategies almost never function as desired, imagined, or dreamed. There are always limits to how each form of power plays out. Each almost always betrays its governing intentions. For sensory power, code errs, algorithms misfire, data lacks and apps fail. Yet, the exercise of power, even when encountering its limits, produces effects on the accumulation of subject peoples and accumulation of capital. The exercise of power precipitates, organises

and mobilises practices that exceed intentions and produce paradoxical effects. Second, forms of power always elicit resistance. The analytics of power we have developed here and illustrated in Table 1 assumes that each form of power elicits a type of resistance: sovereign power elicits revolt (protest, uprising, occupation), disciplinary power elicits subversion (illegible, polysemic, allegorical) and regulatory power elicits evasion (escape, mimesis, deception, parasitism). To put it emphatically, it is these resistances that make all forms of power visible and articulable. Each form of power draws forth what is a latent or potential resistance into a sensible, visible and articulable existence. Thus, such limits are not sources of lament, but are signals of resistance and objects of analysis.

We suggest that a characteristic type of resistance that has come to symbolise sensory power involves an interplay between transparency and opacity. As Birchall (2016) notes, the rise of transparency as a political ideal misreads its symbiotic relationship with opacity such that at issue is not a choice between the two but how to identify their tensions and contradictions. Fuller (2017), for example, suggests that transparency and opacity constitute not so much a zero-sum game but a game of power. Observing how transparency has become the quintessential virtue of contemporary life, Fuller notes that in relation to authorities it implies the possibility of accountability based on the assumption that everything can be rendered into accounts that are clear and coherent and that can be scrutinised. At the same time, transparency also leads to the creation of 'black sites' – a cynically racist term describing sites where military strategists created sealed sites where some of the cruellest technologies of sovereign power (waterboarding, electrocutions, beatings and sleep deprivation) were exercised. As Fuller says, to maintain transparency as a virtue, such places must be made opaque. To this we might add that, in the case of coronavirus, the accumulation of capital also depends on opacity to gain competitive advantage. The data that sensory power produces is transparent ('open data') but how such data is transformed into analytics or intelligence remains opaque (Noble, 2018; Pasquale, 2015) as are the infrastructures, code, algorithms and machine learning practices (Veale, 2020) that are part of the relations that make up sensory assemblages.

How then do transparency and opacity play out in modes of subjectification? If indeed sensory power demands and dictates absolute transparency, then revolt, subversion and evasion become inappropriate tactics. The accumulation of subjects depends on bodies becoming transparent in their movements, desires and needs. As such, it becomes more difficult for subjects to perform 'I would prefer not to' (Žižek, 2006) or 'consent not to be a single being' (Moten, 2017) when sensory power makes these decisions without consent and distributes bodies dynamically across multiple clusters in which bodies perform responsive actions. We have developed various consent games where we perform the illusion of having control, but sensory power relentlessly and voraciously tracks and traces our movements, desires and needs. What then are the forms of resistance that sensory power elicits? If indeed bodies are enacted by sensory assemblages as part of multiple, relational, fluid, visualised and live clusters, a problem of power becomes not only how to act through revolt, subversion and evasion but to resist the learning machine through opacity. This involves the concealing (encryption, anonymisation, aliases) of traces (spoofing, cloaking), movements (virtual private networks, tor networks) and sentiments (allegory, irony, ruses, memes), and thus making the workings and effects of power transparent. If we had any innocence about the ways we are incorporated into sensory assemblages through apps, devices and platforms before the coronavirus pandemic, then our hope is that we have lost that innocence as sensory power has become all too visible and articulable in the resistances that it elicits.

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