Datafication from Below: Epistemology, Ambivalences, Challenges

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Abstract: The "imperative of data" seems to be at the core of current debates concerning relationships between technology and society, as well as the status of knowledge, freedom and identity. Departing from the plenary roundtable *Datafication and Technoscience from Below: Sharing, Moving, Opening* at the 7th STS Italia Conference held in Padua (June 2018), the authors go through different aspects of the sociotechnical process of datafication, emphasizing from complementary STS perspectives some of the most urgent and emergent challenges posed by the constant exploitation of data at an economic and financial level. Topics covered are ambivalences of datafication and their consequences for everyday life (Pellegrino); the epistemological consequences of the "race to the bottom-up" and fake news as ultimate drift of such a race (Söderberg); data-logies and grassroots epistemologies as conditions for possibility for a datafication from below (Milan).

Keywords: datafication; post truth; fake news; grassroots data epistemology; infrastructuring.

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Inside "the Below": Ambivalences of Datafication and Infrastructuring of Everyday Life

Giuseppina Pellegrino

Contemporary social and daily life is increasingly subjected to a growing and apparently overwhelming phenomenon, that of retrieving, producing, accumulating, tracking and transforming into (economic and financial) value enormous amounts of data through specific technoscien-

tific infrastructures (also called "Big Data Analytics", see Mosco 2017). All this summarized as datafication – a complex and contradictory sociotechnical process – questions the boundaries, possibilities and conditions of knowledge, freedom, and identity. It is of interest that such a process, as typical in technology and media history, is subjected itself to a constant dichotomic and oppositive binary thinking (Sturken and Thomas 2014). On the one hand, the apocalyptic register of those framing technology (in this case, data) as coming exclusively "from above", tools to exert and impose power, namely the power of surveillance and the end of privacy as we used to conceive it. On the other hand, the more "integrated" approach viewing datafication as the trigger and the field of new opportunities, benefits and progressive futures "from below" (on the rhetorical figure "above *vs* below", see Söderberg in this issue).

This contribution frames the issue of datafication and that of "the below" through a long-term perspective, looking at their founding and underlying processes, namely the broader and structural condition of "becoming digital", to quote Vincent Mosco's book title (Mosco 2017). To put it differently, datafication could not exist without – and stays only within – the pervasive digitization of information, whose grounds were built up in the early age of Cybernetics and Informatics, under the flags of freedom and liberty (Kelty 2014). Such an "installed base" (Star and Ruhleder 1996) of data(fication) infrastructure carries out and brings about the distinctive characters of datafication, revealing at the same time its deep ambivalences towards the way organizations, groups and individuals act through dispersed sociotechnical networks where the "imperative of data" is at the core. Just to quote a few of them, data-intensive science, precision medicine, machine learning and artificial agents, open data in Public Administration infrastructures, and the emergence of a "quantified self" represent the high diversity of the forms datafication can take.

As any new technology or sociotechnical process (Marvin 1988; Sturken and Thomas 2004), datafication shows the persistence and durability of hopes and horrors as drivers of the public discourse on technology, a discourse regimen often inspired by presentification, obsolescence and revolutionary perspectives (Pellegrino 2015).

Therefore, while mainstream media concentrate on and fuel scandals concerning the treatment and security of data and information on social media, focusing on the risks of manipulation and cheating (e.g. the Facebook/Cambridge Analytica Datagate; Mueller's investigation on Russiagate), technoscientific infrastructures of data and datafication can and do act from below, in a myriad of sites, fields and circumstances (on "datafication from below", see Milan in this issue). Whereas the media discourse contributes to shape the public and rhetorical side of datafication, putting emphasis either on its dark and dystopic or on its bright and utopic dimension, practices from below, grounded in social movements as well as in everyday routines, are the field where concrete consequences, linkages and nuances in between the dark and the bright take form and

are brought to life. This contribution departs from digitization as the foreground and installed base of datafication, distinguishing the two processes and also comparing them. Then, ambivalences of datafication will be highlighted. Eventually, the concept of "infrastructuring of everyday life" (Pellegrino 2018) will be proposed as a key to go "inside the below" and look at the material as well as hidden texture through which datafication envelopes our lives.

Datafication and Digitization

Data and information are not the same thing; the typical differentiation of the two is based on the concepts of "processing" and "interpretation", which precede data and make information possible. New epistemologies in Human and Social Sciences, as well as the postmodern turn, showed how data itself is not an objective construct, rather fully constructed, to the extent that the same concept of "raw data" is an idealization, if not an "oxymoron" (Gitelman 2013).

The phenomenon of Big Data (a buzzword as well) is pervading the debate in all of the sciences, claiming for a revolutionary approach and endless possibilities of quantification, aggregation and analysis; whereas quantification itself is not at all a new phenomenon, the "big" of big data concerns unprecedented possibilities linked with putting data in relation with others (data, individuals, groups, infrastructures, and so on). Actually,

> Big Data is notable not because of its size, but because of its relationality to other data. Due to efforts to mine and aggregate data, Big Data is fundamentally networked. Its value comes from the patterns that can be derived by making connections between pieces of data, about an individual, about individuals in relation to others, about groups of people, or simply about the structure of information itself. (boyd and Crawford 2011, 1-2)

In particular, with reference to spatial science, "two things that are making data suddenly big are the datafication of the individual and the geocoding of everything" (Cresswell 2014, 57). However, we could not understand the width of datafication without referring to digitization. It is crucial to recognize that it is through Information and Communication Technologies, namely digital technologies, that this trend towards accumulation and valorization of data has become more and more possible, as well as powerful and effective.

We could say that digitization is the general form which transformed the possibility to cope with data and information, through a crucial reduction of complexity: bits (of information) are an abstract, homogeneous, discrete and numerical formatting, enhancing the retrieval, transfer, cumulation of information through digital technologies and especially digital computing. Digital is more of a quality than a quantity, a relation

rather than a content (to use Palo Alto's axioms). It refers to signals, information, data, images, contents, devices, as well as the media.

Digital formats enable synthesis, comparison, storage and retrieval of information. At the same time, it increases exponentially production and makes selection more difficult (see Pellegrino 2018).

If datafication is the latest version of obedience to the imperative of quantification and purification which has so much marked the emergence of the modern world and modern science (see Latour 1993a), digitization is its precursor, as well as the "installed base" of data(fication) infrastructure (see Star and Ruhleder 1996). On the one hand, datafication goes far beyond digitization: data are treated, manipulated and mined (sometimes even "cooked", Gitelman 2013) through more and more sophisticated analytics techniques, not simply digitized. On the other hand, datafication depends on digitization and even more on the increasing convergence with advanced digital technologies, namely the Cloud and the Internet of Things which constitute the sociotechnical infrastructure of what has been named as "the Next Internet", an increasingly integrated system that is accelerating the decline of a democratic, decentralized and open-source Internet (Mosco 2017, 5).

From such a dependence it follows that datafication amplifies and enriches the multiple and diverse contradictions already present in digitized sociotechnical infrastructures, adding to them peculiar ambivalences.

Ambivalences and Challenges of Datafication

As other modern and contemporary phenomena, datafication shows the significance of a classical category to analyze modern culture, that of Simmelian ambivalence: a quality which connects as much as it separates (individuals, groups, objects, and so on). In ambivalence, apparent and jarring contradictions co-exist, on the one hand connecting and on the other separating. In what follows some of these contradictions, considered as particularly challenging, are highlighted. They refer to trends which are not specifically born with datafication, rather emphasized and consolidated by it.

Exposure of the (Quantified) Self and (Co)Dataveillance

Datafication infrastructure is deeply knotted to individuals' bodies and everyday life, due to the increasing level of quantification of human body parameters, behaviour and ordinary practices. Mobility and portability of the Internet connection, the pervasiveness of social media along with the expanding area of apps as proprietary platforms independent from the "mainstream" web, all contribute to personalize and commodify the act of quantification under the big promise to enhance life.

> However, just how much they enhance life is questionable, particularly in light of how constant, if not obsessive, attention to the quantities of life can diminish attention to its qualities or, even worse, reduce these qualities to a set of data points (Mosco 2017, 105).

In this respect, especially health apps can be both an ambiguous, if not controversial pedagogical tool and a new subtle medicalization engine (Maturo et al. 2016). All this adds to the massive and deliberate self-exposure strongly fuelled by digital media and social networks in particular, Facebook and Instagram *in primis*, which have marked the end of intimacy and privacy as pillars of the early modern bourgeois society. The (mass) media and the myth of the mediated center (Couldry 2012), with their emphasis on media celebrity, have been reinforced and amplified by digital media and social networks. On the other hand, the commodification of the individual as customer and consumer through the infrastructures of Big Data Analytics is also designed to advantage big corporations owning much of those infrastructures, namely the Big 5 (Google, Amazon, Facebook, Apple and Microsoft – see Mosco 2017). In fact,

> there is value in the things that are digitized and connected in the Internet of Things, but there is often more to be made from the data the devices generate, the valuable information that makes up the commodified self (Mosco 2017, 106).

Value extracted from and attached to data – a big field named as Big Data Analytics – is a real battlefield for business enterprises (Degli Esposti 2014), but also increases dataveillance, a much older term than datafication, coined by Roger Clark in the '80s (Clark 1988). It refers to mass surveillance through personal data systems used to monitor people's behavior.

What is changed with reference to dataveillance nowadays, is the pervasiveness and literal embodiment of such personal data system, along with the potential of horizontal and reciprocal surveillance based on datafication. In other words, as it happens with mobile communication, surveillance becomes coveillance (Rainie and Wellman 2012), a peer-to-peer phenomenon, more than a top-down process. The way we watch each other goes back to pre-modern ways of life, when the group (clan or tribal) dimension was very strong. But symmetry of control and surveillance is also linked to the concept of "below" and its epistemological consequences when such a symmetry is fully pursued, as in Söderberg's critical review of the "race to the bottom", and Milan's "datafication from below" overview (both in this issue).

Pervasivity of Algorithms and Fragility of Machine Learning

Notwithstanding the size is not the most distinctive characteristic of Big Data, as already said, it is undoubted that the multiplication and increase of the quantity of data and information – often labeled as "data deluge" and "information overload" – represent one of the most evident consequences of digitization, due to its power of homologation. Reducing any piece of information to a binary digit (bit) means to make its (re)production and use easier and easier. At the same time, what has changed is the way such a massive amount is turned into (what is considered to be and validated as) knowledge, which of course is not the same thing as data and information.

> The algorithmic assessment of information, then, represents a particular knowledge logic, one built on specific presumptions about what knowledge is and how one should identify its most relevant components. That we are now turning to algorithms to identify what we need to know is as momentous as having relied on credentialed experts, the scientific method, common sense, or the word of God (Gillespie 2014, 168).

In other words, algorithms are the current compass to orient ourselves in the contemporary ocean of data and information, and especially in the Internet, becoming tools to define and build up public relevance.

Despite their controversial status, algorithms are entitled with objectivity and considered to be impartial, but as any (socio)technical piece of infrastructure they are imbued with negotiations, assumptions and biases, often purified in the public discourse which construct and re-affirms their very relevance. Amongst all algorithms, those devoted to feed Machine Learning predictive processes, show the fragility as well as all the contradictions, "impurities" and heterogeneity of emerging AIs. As STS have widely pointed out, there is nothing such as a neutral or pure technology. Therefore, it is not at all surprising that the various and increasing attempts to build intelligent agents manifest their limits, embedding and reproducing the messy, chaotic and contingent processes of learning and judging. The claim to improving human limits overcoming biases, prejudices and moral dilemmas is far from being reached.

Instead, intensive datafication and machine learning amplify and exacerbate those very limits, embedding them inside emerging sociotechnical infrastructures, as in the case of facial recognition technologies for law enforcement (Vincent 2019).

Increasing Data Manipulation and Scarcity of (Data) Literacy

The "race to the bottom-up" (Söderberg in this issue) and the call for a generalized and extensive epistemology of symmetry have to confront

the persistence and emergence of asymmetries about skills and literacy in treating and making use of data in many contexts and practices.

Possibilities to manipulate and create (fake) data through AI-based technologies, as in the case of Deepfakes videos, pose unprecedented and unexpected ethical challenges, blurring the boundaries between truth and falsity, reality and fiction to extreme levels (Barber 2019).

This type of manipulation and other type of fakes are often oriented to achieve malicious goals, especially in the field of political consensus and electoral propaganda (it is notable that in occasion of the latest European elections Facebook removed over 200 fake accounts in the flood of fake-based far-right propaganda – see Lapowski 2019).

On the other hand, skills and literacy to face with data deluge, information overload and algorithmic editorial processes are neither promoted nor widespread at educational and societal level. An exception in this regard is constituted by the case of Chinese government recently pushing for special programs on Big Data and AI education at school (http://www.chinadaily.com.cn/a/201903/14/WS5c89bda6a3106c65c34ee983.html).

However, it has to be noted that delegation to non-humans widely pointed out by Latour and ANT is going to converge with the specific "autonomy" inscribed into machines able to learn and to be trained (not without biases, as annotated above) and aimed at generating new kinds of expert systems and validated (algorithmic-based) knowledge.

The ambivalence here is in the peculiar way new media technologies enter and sometimes disrupt older and more recent skills, practices and literacy.

Therefore, while new (information and data) literacy is needed, "older" types of literacy seem to be disappearing because of scarce exercise or insufficient education and training. Rates of functional illiteracy in adult population seem to be significant in many Western countries, and beyond (ELINET 2015). The frame is completed by very pessimistic studies like those carried out by the German neuroscientist Manfred Spitzer, which theorize the emergence of a peculiar form of cognitive decay and breakdown due to ICT overuse, called "digital dementia" (Spitzer 2012).

Such a perspective goes far beyond that of an anthropological transformation, assuming digital natives and latest generations growing up digital are losing terrain and domain with reference to brain development and evolution of cognitive and emotional skills.

To sum up, datafication questions the feasibility and adequacy of literacy and education systems, as well as the ethics (to be) embedded in tools, dispositive and infrastructures which mobilize new routines, new ways of doing things in our daily life, as well as new forms of knowing, judging and trusting our human and non-human companions.

Inside "the Below": Infrastructuring the Everyday Life

Going inside "the below" (of datafication) means to recognize that the very techniques which can result into fake news as a drift of the "below imperative" and the principle of symmetry (Söderberg in this issue) can also constitute an infrastructure to emancipate and mobilize marginal groups. Various social and protest movements have built upon grassroots data epistemologies (Milan in this issue), to the extent of configuring peculiar forms of hybrid digital activism (Treré 2019).

Beside the challenges exposed above, however, datafication and digitization surround at both material and dematerialized level our daily routines, our practices and our sense making of what is real, true and trustable.

Therefore, in order to disentangle ambivalences of datafication from below, and what "below" itself implies and contains, this contribution aims to propose a further STS insight to data and their consequences. Such an insight consists of looking at everyday life as assembled through and shaped by infrastructures from which data, information and knowledge emerge as ecological relations with practices, contexts and boundary objects (Star and Griesemer 1989). In particular, the concept of everyday life as a continuous process of infrastructuring seems to be a consistent tool to frame the ecologies and boundaries of appropriation, care and maintenance of our digitized lives (see Pellegrino 2018). All of us, and not only activists in grassroots movements, are called to act from below, coping with and shaping the infrastructuring of our digitized everyday lives, a process which becomes routinized and black-boxed until breakdowns and doubts make it emerge again and again.

Being similar to ecological, fragile and highly diverse textures (Star and Bowker 2006), day-by-day infrastructuring processes allow to put at the center the relationship between visibility and invisibility, the role of doubt and breakdown, the installed base of knowledge, routines and common sense as well as the practices of care, maintenance and repair where innovation and renewal can emerge (Jackson 2014).

Coping with challenges of datafication means also acting from below *à la* de Certeau, resisting through interstitial spaces, including those of voluntary on line dis-connection and media refusal (Kania-Ludholm 2018). Deliberate interruption of digital ubiquitous communication can enact different practices of care and repair, as well as alternative sense-making of technoscientific infrastructures from below, where the below is our day-by-day struggling with humans and non-humans.

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Post-truth: The Epistemological Race to the Bottom-up

Johan Söderberg

In this contribution, I will reflect over the rhetorical figure whereby a "bottom" position is opposed to an "above" position, serving as a grid for normative and theoretical orientation in STS interventions. The same binary opposition can alternatively be spoken of as an "outsider" against an "insider", or a "lay person" against an "expert". The last couple of concepts gives a hint about the direction and the relevance of such a figure within the STS context. More examples of interest for the STS field are patients vis-à-vis doctors, as well as users vis-à-vis designers. In spite of the widespread prevalence of this rhetorical figure in the literature, it has not yet been rendered explicit and made into the subject of a sustained reflection. Typically, the binary opposition between the two – above and bottom – is taken as a starting point of the empirical inquiry. We are supposed to know intuitively what actor is on the bottom rung and what actor is on the top rung on the ladder. The lack of clarity about the criteria on which this judgment draws, is a growing liability in the study of science and technology. Every actor that has a message to sell to the public will try to pass it off as coming from the bottom-position, thereby laying claim to the legitimacy that has been invested in that position by society. This is most clearly demonstrated in the phenomenon of astroturfing (McNutt and Boland 2007).

My contention is that the above mentioned rhetorical figure engenders a 'race-to-the-bottom' that the predominant, theoretical and epistemological tenets in STS are ill suited to deal with, because those tenets cannot register cases when politically and/or epistemological weak actors are fronts for more powerful actors. New theories are needed that give guidance to inquiries into what kind of bottom-positions are really at the bottom and what bottom-positions are, on a closer inspection, much higher up in the hierarchy, when factual statements are being made. Lack of clarity in this regard is widespread in the literature, because it is rooted in some widely shared, almost foundational, philosophical and epistemological tenets. It is the deconstruction of actors' truth-claims, during the past forty years, that has brought about a corresponding overinvestment in the claims that actors are now making to be speaking from a margin. The normative significance of deconstructing scientific truth claims rests on the assumption that such assertions are welded by powerful actors in order to extend their epistemological authority over less resourceful actors. Hence, the symmetrical treatment of truth and falsity is generally taken to level the playing-field between more and less established actors (Ashmore 1996).

One explanation for the widespread appeal of this approach could be that it allows for a "have-the-cake-and-eat-it-strategy" within the scholarly community. A symmetrically conducted case study carries a normative load without requiring of the scholar to render his/her political views explicit. Hence, the scholar may honor the academic values of objectivity without giving up on being critical. The drawback being, however, that the position of the bottom acquires a foundational importance in the symmetrical-yet-normative inquiry. The discursive construction is put out of bounds of empirical scrutiny. If we, in accordance with the symmetry principle, exclude the possibility that a propositional statement refers to a corresponding state in the external world, by which we could otherwise have told apart a better from a worse statement, then we need to assign this discriminatory function to some other point of reference instead. There is no way of navigating in a commonly lived world without having some means of weighting conflicting, factual claims against each other. That would be to confine oneself to a state of eremitic isolation. A classic alternative to the correspondence theory of truth is to discriminate among the different claims on the basis of their internal coherence (or lack thereof). The known drawback is that this approach closes in upon itself, providing no leverage to differentiate between statements in relation to the external world.

The rhetorical figure of appealing to the actors' marginalized position in a hierarchical order seemingly resolves this epistemological quagmire, by shifting the debate from the epistemological level to a moral register instead. Now, moving in the moral register, it is possible to assess the validity of statements about the world by referring to the relative marginalization of the actors making those statements. That does not mean that whatever a marginalized actor is uttering is to be taken as true, reasonable and consistent. On the assumption that we have decided in advance to treat all knowledge statements as equally (in)valid, this ought not to be of any concern. It suffices to know that those utterances are not being given the same credulity in society as other statements that are supported by scientific institutions and expertise. This in itself justifies a preferential treatment of the marginalized actor's perspective over other perspectives. Although the point of departure of this argument is an idea about fairness, it can easily be aligned with one well-established notion of scientific objectivity. This interpretation of 'objectivity' puts stress on bringing the greatest number of different perspectives on a question. Hence, it is the very marginality of a perspective that makes it so precious in the efforts to tell the whole story and to give the full picture. In one stream of feminist STS, standpoint epistemology, this is known as "hard objectivity". It is opposed to the skewed forms of objectivity that, although abiding to the strictures of the scientific method, contributes to marginalizing women's perspectives in the sciences, hence rendering the sciences less objective than they otherwise could have been (Harding 1995).

This offers a compelling solution to the dilemma of how to discrimi-

nate between conflicting statements about the world without making assumptions about the truth content of those statements. It is so elegant a solution, in fact, that it exercises a gravitational pull even on theoretical positions in the STS community that are avowedly apolitical, such as in the ANT-and-after-tradition. Although authors in the latter tradition refrain from declaring normative commitments, their selection of problems for study such as, for instance, users (Woolgar 1990), patient groups (Rabeharisoa and Callon 2004), and disabled (Blume et al. 2014), is surprisingly consistent with the cases being studied in overtly political, STS traditions, as is showcased by David Hess' social movement approach to the sciences, or Andrew Feenberg's critical constructivism. The contention is that this outlook is commonly shared in both high church and low church STS schools.

Alas, if scientific validity has been shown to be constructed, then we should expect to find that the bottom-position is just as much of a construction. The emancipatory aspirations, associated with the deconstruction of scientific truth claims, hinge on the most often implicit assumption that constructions of the sort are the work of actors with power, money and prestige. This commonly shared assumption is underpinned by the Nietzschean/Foucauldian formula: "Power equals truth". However, if power can mask itself behind truth-claims, why could it not equally well dress up as being marginal? A more cautious starting point would be to assume, that Power takes whatever gestalt, depending on what kind of claims that society is putting its confidence in for the moment. In the positivist 1950s, it was the authority of the white-coated doctor that convinced the public to keep on smoking cigarettes. Nowadays, it is often better to call on the authenticity of a patient group, when trying to sell the same kind of messages to the public and to regulators. This change of mood, the *Zeitgeist* of our time, goes by the name "post-truth". It calls for a redirection of the deconstructive thrust. As much effort that has been placed into deconstructing actor's truth claims, needs to be put into deconstructing their claims to be speaking from an imagined below-position. One might balk at this proposition for good reasons. First, because of the nihilism that such an endeavor seemingly implies. If claims to victimhood are found to be as much of a construction as truth claims are said to be, then the moral fabric of society melts into thin air. Second, because the appeal to a "below" position was inserted to stabilize a scholarly discourse that was fatally undermined when the weapons of critique took aim at science, knowledge, and rationality, that is to say, when critique turned on itself.

This dilemma, although not entirely new, has been put in a sharper relief by the outburst of post-truth. As is known, the symmetry principle lays down that actors must be taken on their words when they claim to be the equal contenders of scientific claim-makers. Not to do so would be the same as assisting in the marginalizing practices of mainstream, scientific discourse. Differently put, the symmetry principle gives no leverage

for distinguishing between the benevolent outsiders (sheep farmers, indigenous people and disabled) and the deplorable ones (anti-vaccination campaigners, global warming deniers and intelligent design-proponents). Certainly, scholars have been perfectly capable of making that distinction anyway, but the criteria for passing those judgements were through-and-through intuitive. Until recently, nobody noticed it because the same intuitions were shared by everyone in the homogeneous, academic community. There was shared and wide agreement upon which outsiders were the good ones and which were the bad ones. The breaking apart of this consensus is part and parcel of post-truth. Hence the need for clarifying the criteria by which actors are claiming to be on the bottom rung on the ladder. It must be possible to assess those claims, asymmetrically, so that fake claimants (for instance, white supremacists being excluded from mainstream media coverage, or corporate sponsored climate change deniers being excluded from contributing to IPCC-reports) can be told apart from real ones (indigenous people being cornered out by a mining company, etc.).The criteria by which "fake" and "real" claimants can be distinguished in the above scenario, are the same principles whereby "false" is separated from "true". In order to determine whether or not an actor is actually speaking from that bottom-rung on the ladder, that he/she is laying claim to, the possibility of making references to factual states in the world is indispensable. The attempt to take foothold in a moral register, instead of an epistemological one, whereby the scholar can pass asymmetrical judgements on factual statements without violating the symmetry principle, has proven to be a dead end. It merely pushes the external referent one step back in the argumentative chain. Perhaps the referent has now been put out of sight from the analyst, but that just means that he/she presupposes a correspondence between his/her discourse and the world without accounting for it (Marres 2018; Hoffman 2018). The only move forward that is intellectually consistent is to abstain from making moral distinctions between self-appointed outsiders' statements, in lieu of making epistemological distinctions of those same statements. Differently put, the whole "basket of deplorables" must be given their full hearing. Steve Fuller (2017) is alone in "walking the talk". We should be grateful towards him for having clarified the price that is to be paid for adopting a through-and-through symmetrical stance on truth. That no-one else in the STS community seems to be willing to follow in his footsteps is highly significant.

Conclusion

With post-truth has come the belated insight that the democratic promises that have hereto been associated with the levelling of all truth claims to a single, rhizomatic plane are bogus. Everyone from Latour (1993b)[1] to

Fuller (2019) are banking on this promise of the bottom-up, in order to denounce the arrogance and paternalism of the "critical critics", those who think they know better than ordinary folk. This is what I elect to call an "epistemological race to the bottom-up". What is typically understood by the expression "race to the bottom" is something quite different: a global, neoliberal order where nation-states are constrained to lower their welfare expenditures below that of their competitors on the world market, with the aggregated result of a world-wide reduction of welfare standards. I play on this expression to make the same point in relation to epistemology. When sociologists are being exhorted to give up on their theoretical pretences, in place of which they are asked to "follow the actors", especially those actors who are the least resourceful – epistemologically speaking, then this amounts to a call for contracting the analytical horizon of the social sciences. Astroturfing has brought home a point that an older generation of sociologists of knowledge were more sensitive towards, namely that the epistemologically weak actors are the ones least capable of fending off hegemonic worldviews, the ones most likely, in other words, to be "astroturfed" (Gouldner 1973; Merton 1973). This point has been lost on a whole generation of social scientists who, under the towering influence of Michel Foucault, Michel de Certeau, and others have subscribed to the promises of the bottom-up. Those promises where once forged out of a general disappointment on the left with the Leninist party strategy. The resolute counterpoise to the endless race to the bottom that goes by the name "post-truth", is to revive the old, discredited notion of the party vanguard, and start to figure out what theoretical and epistemological lessons it still holds in store for us.

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For a Datification from Below

Stefania Milan

The significance of grassroots data epistemologies

Datafication represents a novel, powerful system of knowledge which has altered the conditions under which we make sense of the world and act upon it. It constitutes an unprecedented paradigm shift (see Kitchin 2014), which amplifies the changes brought about by digitalization since the 1960s. With the automation turn, in particular, much emphasis rests

on the role of artificial agents and machine learning in decision-making. The belief that artificial intelligence solutions might know better than, for example, policymakers, is gaining traction also in popular discourse (see Helbing et al. 2017). With state agencies being often unfit for the challenge, or simply late in comparison to the corporate sector, users and citizens seem to have lost ground. The balance of power appears to have tilted for good on the side of large companies and, to a lesser extent, state institutions – the only organizations with the technical and financial capabilities to collect, process, make sense, and leverage ever-larger magnitudes of information. Meanwhile, however, individuals and groups increasingly engage with data and data infrastructure, fashioning new ways of being citizens in the datafied society (see also Hintz et al. 2018).

How does 'datafication from below' looks like? How can data generate citizenship and spur civic engagement? Building on a four-year sociological analysis of how datafication alters democratic practices of participation, this essay elaborates on the possibilities and conditions of a 'datafication from below' that can put citizens back into the game – both as individuals and collective agents. In the age of surveillance capitalism (Zuboff 2019), 'big data' have transformed the ways in which truth claims are made. Quantification, for one, have taken central stage, foregrounding new regimes of measurement (Espeland and Stevens 2008). It is often presented as a qualitatively superior, infallible way of knowing, which results in a push towards an objectification of the social world. But not only machines learn through 'big data'. Humans do as well, as we are increasingly exposed to narratives and ways of learning and understanding typical of quantification – regardless of how 'big' the data in question is. 'Living with data' (Kennedy 2018) and the emerging ways of knowing associated with it are so entrenched in the fabric of daily life to deeply influence our ways of making sense of interpersonal and spatial interactions – and, paradoxically, of social change as well. It is the emergence of grassroots data epistemologies (Milan and van der Velden 2016) and novel 'data worlds' (Gray 2018). Let us look at some examples. Quantification is progressively entering the repertoire of social movements across the globe. For example, the #NiUnaMenos (in English, not one [woman] less) mobilization in Argentina, a country ridden by high rates of gender violence, embarked in the creation of the national index of sexist violence, a database 'from below' documenting the assassinations of women in the country, in view of putting the issue on the public debate (Chenou and Cepeda-Másmela 2019). Black Lives Matter, mobilizing against systemic racism towards black people in the United States, has harbored 'Data for Black Lives', a group of activists, organizers and scientists producing data on, amongst others, racist violence and police brutality. They see "data as protest. Data as accountability. Data as collective action" and are committed to "using data science to create concrete and measurable change in the lives of Black people" (Data for Black Lives, n.d.). The Argentinian national index of sexist violence and the activities of Data for

Black Lives are instances of "counter-data action through community-collected data", serving the purpose of "provid[ing activists with] evidence" for "claims and experience (…) which in turn they could marshal as support for their concerted efforts" (Meng and DiSalvo 2018, 1; see also Currie et al. 2016).

To be sure, similar techniques of grassroots production of statistical or numerical evidence have appeared earlier in the social movements' repertoire, although for a long while they represented merely a tiny and somewhat hidden minority in the social movement ecology. 'Stat-activists', for example, used statistics towards 'denouncing a certain state of reality' in view of changing it (Bruno et al. 2014, 198), such as the post-1968 protests against unjust imprisonment practices in France (Salle 2014).

If counting is not entirely new amongst progressive militants, and it has historically allowed disempowered communities to 'count' in society and make their issues and demands visible (e.g., Gabrys et al. 2016; Rajão and Jarke 2018), the hype around the possibilities of 'big data' has revamped existing imaginaries around quantification and measurement. It has popularized – and eased, thanks to a wealth of accessible software tools – data-based interventions and campaigns. These have adopted a variety of tactics, such as crowdsourcing, mapping and data visualization (e.g., Meier 2015; Gutierrez 2018; Tactical Tech Collective 2013), and exploited different devices and platforms including citizen-built and citizen-operated sensors (see e.g., Marres 2011). Occasionally, they have questioned the mainstream narratives associated with data, producing their own original imaginaries (Lehtiniemi and Ruckenstein 2018) or opposing the mainstream imaginaries when these reproduced, for instance, colonialism (Ricaurte 2019). All in all, big data epistemologies and narratives, also when re-appropriated by citizens and grassroots groups, have progressively colonized the collective imaginary in a sort of performative and deeply ideological process in which the socio-cultural and political understanding of people is demarcated through their exposure to and practice of material artifacts such as data infrastructure. This should not surprise us: as neoliberal subjects, Beer (2016, 149) argued, we have a "cultural interest in numbers, and a culture that is shaped and populated with numbers". As a consequence, quantification has permeated both the activist and public discourse. A number of popular metaphors associated with datafication and big data (Stark and Hoffman 2019) have supported this process. For example, the phrase "We are the 99 percent", propagated by the Occupy Wall Street mobilization worldwide, is probably the most fortunate movement slogan of the last decades (Rogers 2012). A variety of actors have contributed to this development. The public administration sector, for example, making its data available as open data (see Ruppert 2015), partakes in the creation of empowerment imaginaries of civic engagement related to the role of data in making discourses. But what is of interest here is the process through which data becomes a collective story and, even more so, a story of empowerment and agency.

Agency in the Age of Datafication

To grasp how social actors can exploit datafication to regain or reclaim agency, we ought to understand what (political) agency consists of and how it evolves under the pressure of novel data imaginaries. Sociologically speaking, agency refers to the process of "making sense of the world so as to act within in" (Couldry 2014, 891). It concerns "intentional, reflexive practice oriented to (political) action" (Couldry 2014, 891), in "domains in which action is both personal and informed" (Feenberg 2011, 1), thus excluding unintentional or routine acts such as breathing or buying a ticket before boarding a train. What's more, agency is not merely an attribute, nor is it given or static. Rather, it is best viewed as a process (Emirbaye and Mische 1988). More specifically, agency is "the temporally constructed engagement by actors of different structural environments – the temporal-relational context of action – which, through the interplay of habit, imagination, and judgement, both reproduces and transforms those structures in interactive responses to the problems posed by changing historical situations" (Emirbaye and Mische 1988, 970). Agency thus incorporates a fundamental temporal dimension: in other words, it both evolves over time, and it embeds and makes sense of various sequential levels. It is rooted in the past, as people continuously activate past patterns to order their universe and sustain identities over time. It is projected towards the future, as social actors engage in the imaginative generation of future trajectories and possibilities. Finally, it unfolds in the present, when individuals exercise their ability to make practical and normative judgements, and act upon them (Emirbaye and Mische 1988).

Is agency then altered by datafication, and how? If we adopt Emirbaye and Mische's definition, we can see how agency is not entirely re-written by the paradigm shift of datafication. It is transformed in at least three ways. Firstly, datafication alters what we may call the 'social epistemology' in which social actors operate, thus touching upon the informed and reflective components of agency. Secondly, it changes how we mediate and interact with each other, affecting the relational nature of agency. Finally, it alters how we experience and make sense of the world around us, modifying thus the situated character of agency. In other words, datafication has the potential to alter what Emirbaye and Mische referred to as 'imagination' and 'judgment'. Given these evolving conditions, how can individuals and groups reclaim their agency in the age of big data?

One way in which individuals and groups can articulate and reclaim political agency today goes under the label of 'data activism'. As I described elsewhere (Milan 2017, 2018), data activism embraces those social mobilizations taking a critical stance towards datafication and mass surveillance. It consists of a variety of sociotechnical practices and tactics

that, through the creative use, appropriation and/or generation of data and software, interrogate the fundamental paradigm shift of datafication. Examples include open data activism (Baack 2015), the creative generation of data for campaigning, through for instance forensic practices promoting a "disobedient gaze" (Pezzani and Heller 2013) or open source intelligence tactics (Deutch and Habal 2018), hacking data for the public good (Schrock 2016), and the development and adoption of counter-surveillance strategies (Gürses et al. 2016). Data activism is important for society today because it identifies and disseminates disruptive ways of making sense of the (social) world and interacting with it, actively counteracting the hyper-positivistic ethos and inevitability surrounding big data. It points to new roles for active citizens and contributes to the revitalization of the state-citizen relation.

We can distinguish at least two forms of data activism, positioned along a continuum. On the one hand, proactive data activism identifies practices of affirmative engagement with data, exemplified in the #NiUnaMenos database of gender violence or the efforts by Data for Black Lives. Proactive data activism takes advantage of both technological and legislative innovation and data. Reactive data activism instead seeks to counter the threats that come along with datafication, most notably mass surveillance and privacy infringements. Practitioners, for instance, try to popularize security tools for human rights defenders, while engaging in advocacy to ameliorate legislation and protect citizens. Although the boundaries between the two types of data activism are flexible and particularly permeable, proactive and reactive instances of data activism tend to embody distinct values and attitudes towards data and datafication, as well as distinct perceptions of, e.g., state institutions. Proactive data activists can be seen as tendentially reformist, as they try to marshal data to ameliorate the output of the state. Reactive data activists, on the contrary, tend to sport a distrust of institutions, seen as complicit in the extractive practices of surveillance capitalism. Yet, the two types are not antithetical: both posit information as a constitutive force in society with a direct influence on social reality (cf. Braman 2009). Interestingly, while traditionally confined within the sub-group of sufficiently tech-savvy political activists, data activism has been steadily expanding its area of influence over the last decade, signalling that the citizenry at large is becoming more aware of the possibilities and challenges harbored by datafication and data infrastructure. But what transforms data into political activism – or data activism, to be more specific?

Data-logies and the Conditions of Possibility for a Datafication from Below

Where does data meet – and possibly becomes a driver of – political agency? The focus here is not on 'ordinary forms' of engagement with da-

ta by non-expert citizens, nor their experiences of datafication (for a detailed analysis of the "layers of conscious experience" in everyday forms of engagement with data see Kennedy 2018). The analysis instead centers on motivated – although variably skilled – individuals who consciously and deliberately engage in 'intentional, reflexive practice' (Couldry 2014, 891) at the interplay of data and social change.

We turn our attention to the meaning-making activities of individuals and groups approaching data and data infrastructure for social change. 'Meaning work', or the 'interactive process of constructing meaning' (Gamson 1992, xii) performed by social actors at the micro (=individual) or meso (=group) level is at the core of taking action in any kind of movement activity (see also Melucci 1996). However, in the case of data activism, deeply rooted as it is in the sociotechnical practices of first-hand engagement with data and data infrastructure, meaning work is entrenched in the specific materialities of the datafied society – and in the critical technical practices (cf. Agre 1997; Dunbar-Hester 2012) they nurture (that is to say, anything from programming to visualizing data to deciding the privacy settings of a smartphone). The peculiar articulation of meaning work and materialities typical of data activism results in original declinations of political agency, too.

I argue that data activism embraces and articulates radical 'data-logies', surfacing the singular meaning work described above. The neologism takes inspiration from the ancient Greek noun 'logos' (λόγος / λέγω), which means discourse: more broadly, it points to the act of telling (a story), relating (as in establishing relations), and narrating a reality. Data-logies, then, refer to ways of thinking about and making sense of data(fication), with the goal of 'acting on' (Kubitschko 2017; Milan *forthcoming*). They identify the oppositional and/or disruptive logics associated with data and datafication from the bottom up. Analytically, data-logies combine three elements, namely: i) the alternative epistemologies of data activism, with ii) the socio-technical practices of engagement with data – from critical technical practice to ordinary-people forms of engagement with data(fication), with iii) the materialities of datafication – from software to databases to new ways of measurement, categorization and automation. Data-logies emerge when and where the dimensions of the cultural (which included the 'habit' identified above), the moral (as in values subtending to collective action), the symbolic, and the emotional meet the sociotechnical practices of engagement with data. They are simultaneously individual and collective, but it is in their collective dimension that they best fulfil their empowerment promises and contribute to the process of redefinition (and revitalization) of political agency today.

What makes data-logies emerge, evolve, travel across groups and individuals, be re-appropriated and ultimately translated into action? We can identify at least three 'conditions of possibilities' for political agency in the datafied society. The first is critical consciousness. Inspired to the notion of conscientization (*conscientização* in Portuguese), indicating the

process of 'gaining consciousness' as the main outcome of the critical pedagogy proposed by Brazilian educator Paulo Freire (Freire 1968), critical consciousness is the result of an approach to education that enables subjects to become aware of the socio-material conditions of injustice they live in, and empowers them to translate this sense of injustice into transformative action. According to Freire, taking action is a constitutive part of any empowering learning process. Fast-forward to today, fostering a critical consciousness in the age of datafication is about disentangling the challenges individuals face in making sense and living with datafication and surveillance, including risks and opportunities. Understanding who and what hides in the data shadows is a key step towards transforming one's surroundings, exercising 'judgement' (see above) and fostering active citizenship.

The second condition of possibility we can identify has to do with data literacy – or the ability to find and evaluate critical information on data-related processes and risks. Data literacy concerns, for example, how to protect one's privacy on social media, or how to encrypt email communications. If opacity and complexity are integral features of datafication, on account of often obscure industry and state practices and the highly technical nature of most of these dynamics, data literacy opposes the sense of disempowerment that datafication harbors. In particular, it could serve the purpose of 'demystifying' the processes subtending to datafication – from algorithmic personalization to mass surveillance. The specific entanglement of sense-making and the material dimension that characterizes 'acting on' datafication, however, means that data literacy must include some sort of first-person engagement with data and/or corrective measures against surveillance and possibly making one's hands dirty with technical practice – from data analysis to visualization. This demystification can contribute to lifting the veil that surrounds the data hype and the associated narratives, ascribing the critical attitude to datafication to the 'habit' mentioned by Emirbaye and Mische. Last but not least, the exercise of critical imagination emerges as the *conditio sine qua non* for exercising citizenship and political agency in the datafied society. Critical imagination – a twist on the imagination evoked by Emirbaye and Mische – has to do with the ability to imagine alternatives with respects to immaterial risks (e.g., threats to privacy) and technical practice. Unfortunately, despite the numerous efforts of the digital rights vanguard (Aouragh et al. 2015; Daskal 2018), datafication-related issues have not yet fully entered the agenda of contemporary social movements. This brings us back to what Emirbaye and Mische termed the imaginative generation of future trajectories in relation to what people primarily care about: health care, tax, environment preservation. For critical imagination to spread, we need to articulate new, empowering narratives (as opposed to disempowering ones, such as those often adopted by anti-surveillance activists) able to help people to translate present (often frustrating) experiences in (empowering) future possibilities.

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[1] The supposed *khere* of Bruno Latour when he asked the question if "critique has run out of steam" is on a closer reading just a restatement of his old polemic against sociology, repackaged as a self-critique.