Future Anthropology Ethics and Datafication: Temporality and Responsibility in Research

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Abstract
In this article, we argue for an ethics of big data that is embedded in the emergent processes through which data are made, interpreted, and mobilized in mundane everyday contexts and examine how this could potentially be played out in research practice. We situate this as a response to a current crisis in accountability that has arisen in the context of the use of digital data to inform societal interventions, which we propose calls for a future-oriented anthropological ethics situated in the ongoingness of life. Such a standpoint offers a revised approach to temporality and attends to the ethics of intervening and engaging with the uncertainty of what is as yet unknown rather than simply with an ethics of the past. It offers us an opportunity to think differently about big data and ethics and to create an alternative ethics for big data and their analysis.

Keywords
ethnography, ethics, big data

What has been referred to as the datafication of society—“the ability to render into data many aspects of the world that have not been quantified before” (Cukier & Mayer-Schoenberger, 2013)—relating to, for example, governance (Smith & O’Malley, 2017), health (Ruckenstein & Dow Schüll, 2017), space (Sumartojo et al., 2016) sport (Millington & Millington, 2015) has received ample critical attention from the social sciences and humanities (see Baym, 2013; boyd d & Crawford, 2012; Gitelman & Jackson, 2013). As Baym (2013) has put it, “when data appear to be so self-evident and big data seem to hold such promise of truth, it has never been more essential to remind ourselves what data are not seen, and what cannot be measured.” For instance, recent anthropological ethnographies of personal data demonstrate how the experience of data and people’s invisible improvisatory uses of self-tracking data are little correlated with designs that are developed either for the use of data or based on data (e.g., Nafus & Sherman, 2014; Pink & Fors, 2017; Pink et al. 2017). Such critical perspectives raise questions about the ethics of seeing data as complete or objective, and Internet researchers have made strong arguments for understanding ethics as contextual in relation to societal and technological change (e.g., Ess, 2015) and for seeing ethics and method as inseparably part of the same process (e.g., Markham, 2003). Responses have emphasized the processual nature of research and the contingent and incremental ways that knowing and knowledge are produced (Markham, 2013) and have called for (anthropological) “big theory” for big data (Boellstorff, 2013).

In this article, we build on these existing arguments and advance them differently by bringing to them a perspective on ethics rooted in what Pink and Salazar call future anthropologies (Pink and Salazar 2017) and future-focused applied ethnographic practice (Pink, 2017). For a world where the most mundane elements of our lives are inevitably datafied and where predictive data analytics are increasingly used in regimes of governance, we need a research ethics that engages with the emergent mundane contexts where data are made and analyzed, that accounts for the future temporalities of big data analytics and whereby ethics is part of rather than applied to research and analysis. This is particularly pressing and ironic in a context where as Boellstorff (2013) has critically commented big data has “risen to a dominant position in many quarters of the technology sector, academia, and beyond” whereby vastly unequal amounts of public and private funding were being dedicated to the “generation,

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capture, and analysis of big data” in contrast to the threats facing the humanities and social sciences.

Neff, Tanweer, Fiore-Gartland, and Osburn (2017) have started to consider how by bringing together the practices of data scientists who perform data analytics with the critical data studies perspectives noted above, both fields might be improved while also making for a more ethical approach. Based on their ethnographic studies of data scientists, they have argued that institutional arrangements should be established to engender contexts where,

“Engaging the insights of critical data studies will improve data science. Careful attention to the practices of data science will improve scholarly critiques. Genuine collaborative conversations between these different communities will help push for more ethical, and better, ways of knowing in increasingly data-saturated societies. (Neff et al., 2017)

This is an important step, however, the gap that remains, we argue, lies in the need to develop ways of knowing in these data-saturated contexts that bring together understandings of data as experiential and the ethics of a future-focused anthropology, with the ethics of the use and analysis of big data.

For instance, in anthropological ethnography (as for Internet research as noted above), there has long since been a deeply implicated ethics of engagement with participants in research, and as such, an ethics that is part of methods in such a way to be inextricable from the playing out of the principles of research practice (see, for example, Amit-Talai, 2000; Pels, 2000; Strathern, 2000). In contrast as is evident from recent studies of its practice (e.g., Neff et al., 2017; Tanweer et al., 2016), big data analytics does not have an equally deep form of or long history of engagement with people. Indeed, because it is abstracted from the sites of human experience that it refers to, big data analysis does not attract forms of or claims to accountability for the sites from which it emerges, or where it later becomes part of the way sites, localities, activities, and forms of governance might be experienced. It is this lack of accountability that is often seen as problematic and which makes a new ethics of big data an urgent concern. However, as Pink (2017) has proposed, traditional anthropological ethnography which has conventionally sought ethical refuge through writing into the past also needs to be reformulated, so that it might cope with the future orientation of its applied and public commitments or responsibilities. This offers an ideal opportunity to re-work how we consider and would practice ethics embedded in ethnographic and big data analytics together as part of a coherent, future-focused, and (new mode of) “mixed methods” research agenda for understanding and acting in the world in an ethical and responsible way.

Thus, the question explored in this article is what if a prosessional ethnographic form of ethics and accountability was implicated in the use of big data, and what paths forward might it follow? In answering this question, we do not map out a new method for big data analysis—since this not our area of expertise. Neither do we seek to change the agenda of Internet research ethics, since many of the principles that its scholars have developed are equally fundamental to our argument (see Lury & Wakeford, 2012; Markham, 2006). Rather we propose a point of departure for a consideration of how ethics might be part of a particular conceptualization of big data, based on our own expertise in the ethics of anthropological ethnography (e.g., Pink, 2017) and in future anthropologies (e.g., Lanzeni and Ardevol, 2017; Pink & Salazar, 2017). This entails generating not an ethics process for big data analysis but instead an ethics through which big data might contribute to an emergent and possible rather than objectified and predictive future.

In what follows, we first consider examples of what we refer to as a crisis in accountability that has arisen in the context of the use of digital data to make societal interventions. These literatures do not so much discuss ethics, but in their calls for new forms of accountability in the use of data both scholarly and activist discourses that problematize data-driven policies and designs they are suggestive of the need for a new ethics to be embedded in the methods that these processes employ. We then reflect on existing and possible relationships between ethnography and big data and consider the implications of this range of correspondences and connections. Then, we outline a future-oriented anthropological ethics, which both departs from conventional approaches to ethics in anthropology in its response to the need for attention to the ethics of intervening (rather than simply the ethics of the ethnographic encounter) and in its engagement with the uncertainty of what is as yet unknown, rather than simply with an ethics of the past. Finally, we connect this ethics to the findings of the previous three sections to outline the implications of bringing these together.

**The Crisis in Accountability: Ethics Clashes?**

Societal narratives which assume that data can have predictive qualities are problematic (Gitelman & Jackson, 2013), and this along with the idea that data policy, design, or other future-focused areas of societal concern and practice might be “data driven” is deeply concerning. There is an increasing awareness beyond the social sciences and humanities, such as in human–computer interaction (HCI) research, of the need for “a more holistic understanding of the experience of living with data” (Elsden et al., 2015, 2016). However, in practice, data are often problematically treated as closed and fixed objective evidence rather than as an ongoing process of analysis that can only provide open and ongoing ways of knowing. In this context, when data are treated as objective, then the ethics around them becomes equally problematic. Conversely, when data are treated as a process of analysis, then they become possible to apply an ethical approach to the
methods of their analysis and modes of understanding. More specifically, ethics should be part of analysis rather than something applied to it as if separate or as an after event. A good example of this emerges in relation to how societal critiques of data-driven evidence are imbued with an ethics of responsibility. Gavin Smith and Pat O’Malley (2017) discuss how what they refer to as “data-driven governance” in the form of the use of traffic speed cameras “operates to indiscriminately divviate the aggregations it manipulates, it effectively penalizes ‘law-abiding’ members of the public unaccustomed to being the subjects of criminalization.” They discuss how activists against road speed cameras believe both “that the ‘saving lives via speed reduction interventions’ justificatory discourse is an expedient for the state to engage in illicit and misappropriate behaviour under the pretence of delivering public safety” and note a “widespread anger about the methods and tools being used to enforce speed, in terms of their degree of reliability, but also in regard to the underhand way in which they are routinely applied” (Smith & O’Malley, 2017).

Smith and O’Malley’s work shows how data-driven policies or forms of evidence do not necessarily attend to the contingencies of everyday life action or to the intentionalities or moralities of those who become implicated in them. The anticipatory logics embedded in such frameworks of governance and regulation could be seen as having an ethics of protection and prevention toward the potential victims of crime and against the road accidents that are arguably reduced by the presence of traffic speed cameras and the enforcement of fines. They work in ways that are very similar to the audit cultures of anticipatory ethics of regulatory governance systems in academic institutions (Pink, 2017). However, there is another narrative of ethics that these anticipatory logics are not able to account for, and which is precisely the domain of activists. From this perspective, they do not pay attention to the detail, the situatedness, and the contexts of how and where data are made, interpreted, used, and made meaningful. Thus, they do not have a situated ethics that seeks to understand circumstances and actions as they play out. The example shows how because uses of data are usually abstracted from the moments in which they are produced, then it is difficult for them to be ethically embedded in the dynamics of these moments or their meanings. If, instead the situations depicted by speed cameras were to be ethnographically contextualized and understood as situated responses to the contingencies of living particular lives in specific societal circumstances, they would also be understood within a different ethics framework. This is also, as we have noted above, an issue of accountability whereby as Lyria Bennett Moses and Janet Chan (2014) argue,

the evaluation of big data analytic techniques ought to go beyond questions of accuracy and reliability, to concerns about their impact on justice outcomes, the importance of transparency and accountability in public decision-making and the appropriateness of relying upon algorithmically derived extra-legal factors. Big data techniques face similar limitations to earlier empirical techniques, but their enhanced power and reduced transparency combine to increase the potential for inappropriate uses. (p. 646)

This does not mean that data analytics is fundamentally unethical but rather that it is inevitable that its results will be seen as ethically problematic by some and that its accountability is to contexts, values, and frameworks that are abstracted from the social worlds from which data originate, where they have impact, and where they might generate future possibilities and as yet unknown consequences.

There is no single or direct solution to this problem, and it is likely to be one that is grappled with across different contexts and in different ways in the ensuing years. However, big data might be implicated in a different ethical agenda, which offers a vision of a more interdisciplinary, open, and generative approach to making responsible data futures, and ethics. An ethical approach to big data making and analytics, and toward providing for our data futures, needs to be understood through an ethnographic approach, that attends to the contingencies and complexities of the human, technological, and power relations through which data emerge, is given meaning and is mobilized in the world. This involves interrogating the status of data as a way of knowing and as a type of knowledge, undermining existing (often non-academic) assumptions about its meaning and calling for alternative and ethical ways of applying data to contemporary societal, business, and political issues. It also involves understanding what it means to live in a world of data, and why this brings with it a certain ethics that are visible through ethnographic engagement. We propose an intervention into treatments of big data that would take place at a site where big data analytics and ethnographic practice have some elements in common, but where their ethical and conceptual differences have not necessarily been resolved. We refer to this as an intervention, in the sense that we view such a move as already being a societal intervention into what are emerging as commonly held and discursively, politically, and commercially endorsed types of knowledge and beliefs about what big data offer the world.

**Anthropological Ethnography and Big Data: Clashes and Correspondences**

In this section, we first undertake a selective review of existing work relating to the relationship between big data and anthropological ethnography. Where we refer to ethnography, unless specifically indicated otherwise, this denotes the anthropological approach to ethnography that we are advancing here. We then discuss correspondences between ambitions related to big data and ethnography. Here, rather than attending to wider interdisciplinary literatures about ethnography, we focus specifically on design anthropological ethnographic practice since we are interested in its processual approach, attention to the ongoingly changing state of affairs...
in which we live and know the world, and emphasis on concepts of emergence and possibility (Smith et al., 2016).

As Boellstorff has noted, “ethnography” is often presented as the Other to big data.” However, while ethnographic practice and big data analytics offer very different ways of approaching the world, they (perhaps surprisingly) also have various characteristics in common. Design anthropology has in common with big data analytics an applied agenda and a future orientation, and we return to this later. Another possible relationship between ethnography and big data is suggested by Rob Kitchin’s (2014) argument that “Big Data analytics enables an entirely new epistemological approach for making sense of the world rather than testing a theory by analysing relevant data, new data analytics seek to gain insights ‘born from the data’” (p. 2). There is, Kitchin (2014) argues, “an urgent need for wider critical reflection on the epistemological implications of Big Data and data analytics” (p. 10) since, he proposes, data-driven exploration offers a new and non-empiricist approach toward understanding old questions for scholars in the social sciences and humanities in new ways. Such an approach, whereby what we can know emerges from our encounters with the research site, is also characteristic of anthropological ethnography, which does not test a hypothesis or simply fill an existing theory with empirical answers that reinforce it. Rather anthropological ethnography generates and explores questions through a dialogue between theory, the ethnographer, and the participants in research, as we and they move through an ongoingly emergent world.

If Big Data analytics is to take fields of ongoingly or continuously produced data as its field site in this way, then we argue that it has both correspondences with and principles to be engaged with experimental forms of anthropological ethnography. This, on one hand, lies in relation to the need to create categories from the data as Kitchin describes, rather than using the data to simply answer to existing ones. On the other hand, it refers to the need for a processual approach to ethics which has been much debated in anthropology (e.g., Pels, 2000; Strathern, 2000) and an acknowledgment of the need for a future-oriented ethics that acknowledges the contingent rather than the predictable nature of scenarios that have not yet happened (Pink, 2017). Thus, we need to account for both “the recognition that our futures are contingent because our present is as well” (Bessire & Bond, 2014, p. 450) and “the radical contingency of the future, including futures that we do not and will never know about” (Irving, 2017, p. 39). This approach puts at its core, therefore, the question of where “futures” lie in processes of activity and engagement (Lanzoni & Ardevol, 2017). Such a processual approach to research, which happens in dialogue with its field site needs a correspondingly processual approach to its ethics and to acknowledge and interrogate its relationship to futures. Neither ethics problems/solutions nor the things that have not yet happened are “out there” ahead of us in a pre-determined future, waiting for us to encounter them. Rather, all are located in the ongoingly emergent present as it unfolds, all are contingent.

As critical data researchers in the social sciences and humanities have demonstrated, a processual approach to data is also possible, particularly, through ethnographic and qualitative research undertaken across the world. This is evident both with regard to how data is constituted (Lupton, 2016; Nafus, 2014; Pink & Fors, 2017; Pink et al. 2017; Ruckenstein, 2017) and in relation to how it is analyzed, showing how rather than simply involving an objective process directed by algorithms big data analytics entails much “contingent, improvised labor” (Tanweer et al., 2016, p. 748). These forms of creativity, evident in the different contexts through which data are made and given meanings urge us to consider how an ethical form of accountability that understands data as having qualities and affordances that identify it as able to be “rotten” (Boellstorff, 2013), “stuck” (Nafus, 2014), or “lively” (Lupton, 2016) might emerge. What these studies make very clear is that data might be seen as open, processual, and “thing like, whereby “things are alive because they leak” (Ingold, 2008).

When we start to think about digital or big data in this way, combined with Kitchin’s rendering of data as dynamic and changing as noted above, then we can envisage a relationship between ethnography and data that is quite different to existing critical approaches to data that have tended to be developed by ethnographers. Anthropological ethnographers, in particular, have tended to find the concept of “data” problematic when used to describe ways of knowing in research (e.g., Shull, 2012; Pink, 2013). Indeed ethnographies of how data are made show clearly that treatments of them as objective knowledge can be viewed as problematic and, in doing so, demonstrate, for instance, that the use of data for “behaviour change” initiatives are problematic precisely because they are based on misguided understandings of both what data are and how people proceed through their everyday lives in a processual world, as creative and improvisatory beings (e.g., Pink and Fors, 2017; Pink et al. 2017). This revisioning of what big data as a processual and ongoingly changing, incrementally made body of materials has some elements that resonate with the ethnographic process, where there is always uncertainty about what will happen next, and an assumption that the research process is always contingent and not set out clearly ahead.

An agenda to bring together ethnography and big data, however, implies further challenges: (1) while anthropological ethnography has embedded in it a commitment to a processual approach to ethics, big data analytics does not and (2) to be able to engage fruitfully with a method like big data analytics that is involved in predictive and anticipatory modes of understanding and intervention, anthropological ethnography needs to develop a future-oriented approach. This means asking what an ethics looks like when it is part of an ethnographic method that accounts for the possibility that we do not know what will happen next, as a given element of the ongoing research process, rather than a risk that can be
mitigated by a single action of approval by an ethics committee. We address this question in the next section.

**Design, Anthropology, and Futures Ethics**

Ethics in anthropology is inevitable as part of the theoretical and methodological orientation of the discipline. Because ethics is inseparable from doing anthropology, being an anthropologist and encountering and becoming co-implicated with people when we do ethnography, the “audit cultures” (Strathern, 2000) of institutional ethical approval and governance committees are inadequate for ethics in anthropology in two ways that are relevant here. First, because they do not offer the kind of accountability that is at the basis of anthropological ethics and as such do not require the deep ethics of the anthropological encounter, and second, because they very often do not recognize the processual and contingent nature of research, and the situatedness (Clarke, 2009) of ethics (Amit, 2000; Pels, 2000). Yet, there is one deep limitation in traditional anthropological ethics as it has emerged since the 1980s; anthropology has tended to take its ethics of the anthropological encounter, and the need to be reflexive about the subjective processes that were part of research. As part of this, anthropology took on a past temporality which involved acknowledging that any description of research participants and their lives and worlds should situate what was written in the specificity of the past moments in which it had occurred. The ethics of this method are important because they acknowledge the situatedness of every moment of happening and knowing. This technique, however, due to its unavoidable orientation to the past, makes it difficult to align it to predictive or other future-oriented techniques of research and intervention in any way that is not (sometimes harshly) critical and that tends to accuse other approaches of naiveté and a lack of accountability. While as anthropologists, we would agree with this stance to some extent, we argue that there is also a need for anthropology to become more active and involved in intervention and in seeking to be involved in the co-shaping of futures as they emerge. Our concern here is to understand how specifically this might come about in relation to big data, but the issue is broader.

To explain how an ethics might be actually played out in an ethnographic research scenario whereby the temporalities of conventional ethnography are already disrupted, we consider Debora Lanzeni’s research with tech designers and futures. For an anthropologist, ethical considerations should continuously be considered from the moment of taking the first steps that will constitute a site of ethnographic research to the process of constructing a social problem. These ethics emerge in multiple ways and almost always in association with the relationships between ethnographers and participants in anthropological research. However, in a processual approach, the conventional structures of these relationships begin to break down and in doing so give way to an understanding of ethics as a necessary everyday occurrence. This everydayness of ethics, therefore, becomes embedded in the temporality of anthropological fieldwork sites, yet, in a processual approach to ethics, this plays out differently to the past-orientation of traditional anthropology. Instead, as Munn suggested, the temporality of fieldwork can be bisected by different time flows. For example, in the case of Debora’s fieldwork, among tech designers, two temporal orders were implicated: one from participants’ technological making and the time reversions it entailed (Chun, 2008; Nielsens, 2014) and the other from the ethnographic tempo that emerged from the tech designers’ future orientation within everyday life. Here, Debora followed the design process of the Internet of Things (IoT) for Smart Cities ethnographically. This meant her inhabiting the everyday life of companies and makerspaces in Europe in which she learned to embrace the sites of her research as they were experienced by the participants in the research, as being in the process of becoming. Technological development, as Chun (2008) has characterized it, is never there but rather is always in the making and continually calling for the next step. This constant movement is oriented to a time to come (the time where the technology at hand will be placed) and to an arrival at a place (a maturity in the design, a functionality in the piece of tech). These conceptualizations of time and place guide the actions and organize the companies, labs, maker/fab spaces and also challenge the common understanding of what it means for an ethnographic research site to be associated with a time and place. In such a research process, an ethnographic approach relies on anthropological ethics principles which acknowledge that people are evaluative and that, therefore, research partners are evaluative. Evaluation is placed in the ongoing flow of everyday life, that is, what Keane (2014) calls “ethical life” (p. 444), which cannot be defined in advance. In the life of techies, what they do with data cannot be moralized beforehand. This example has implications for how we might think about ethics and big data since it reminds us that an ethics beforehand approach is not necessarily applicable either in everyday working life with data or in research conduct (Pink, 2017). Here, as Markham (2006, 2015) has pointed out, discussions might be better oriented to doing well rather than to the accomplishment of certain ethical norms and agreements within academia. Here doing the “right thing” moves the discussion into the realm of individual moral codes. An ethnographic approach to the making of big data could show how morality lies at the core of this “everydayness of ethics” (Keane, 2014) rather than in what we do with the data. This
means moving from a naturalistic view based on “causes and effects” which people are unaware of (Keane, 2014) to a more future-oriented stance that considers ethics as constituted through people’s continually renewed awareness as ethics ongoingly emerge.

This processual ethics that forms the basis of Lanzeni’s work therefore calls for an ongoing form of accountability, which is not (yet) necessarily an underpinning feature of big data analytics. However, by probing further into what can happen when ethnography and digital data are brought together we can reflect on how existing examples where data analysis becomes inextricable from an anthropological ethics imply a processual data ethics. Using qualitative and quantitative methods together is of course well established in the “mixed methods” tradition (Bryman, 2006), which seeks to combine the two. However such combinations remain less tested in interdisciplinary projects, partly of course because the recent rise in interdisciplinarity is relatively new and introduces a number of complexities and scales of disciplinary connections (Barry, Born, & Strathern, 2007). For example, bringing together ethnography with quantitative engineering data is not new, although it is something that has very infrequently been productively achieved. There are various reasons for this, not least that it can be difficult to calibrate two quite different modes, velocities, and practices of research, analysis, and representation, particularly, when researchers from vastly different disciplines can find it difficult to comprehend each other’s practices. However, as demonstrated by Cosar-Jorda et al. (2013), there are distinct advantages to be found in bringing together ethnographic research and digital data that has been collected over a period of time. As part of the Low Effort Energy Demand Reduction (LEEDR) project for which Sarah Pink led a strand of ethnographic research in relation to design and engineering strands, the research team developed a combination of energy monitoring and measurement data collected in homes and video ethnography research into the ways that people lived and used energy in the same homes. The video ethnography enabled researchers to produce ways of knowing about the tacit and often unspoken experiences of everyday life with rather than about participants, by taking a collaborative rather than observational approach (Pink, Leder Mackley et al., 2017). Cosar-Jorda et al. (2013) found that “The detail of monitoring data and ethnographic insights in actual practices for sample households allows us to find new and different entry points into the complexities of domestic energy consumption” (n.p.). Perhaps most significantly for the discussion here, this work engaged with ethnographic research, and monitoring data collected over a period of months, to explain instances of energy use in ways that would not be available to engineering researchers alone and to identify enduring gaps in knowledge. In such research, there is also an ethics to the bringing together of such different approaches which acknowledges how human experience and activity is inseparable from data, and that these are contingent and situated in the present and will remain so in the future. A key ethical implication is that such understandings should enable us to better understand how energy demand and use which according to engineering analysis might be seen as “waste” is in fact necessary for people to accomplish key everyday tasks. Following this logic, we can better contest neoliberal behavior change discourses that attribute waste to individual consumers (see Shove, 2009), through understandings of how human activity and the monitoring data that corresponds to it are framed and limited by societal structures. Such experimentation is important across a range of fields of interdisciplinary research that appreciate the importance of uniting ethnographic and measurement types of research rather than simply producing defensive forms of critique. The example of energy research is also significant because the project that Cosar et al. discuss was a UK Research Council–funded project designed to have impact as part of the wider agenda toward energy demand reduction and climate change mitigation (see http://leedr-project.co.uk/).

Such examples start to demonstrate how in the context of the harvesting and analysis of big data, such steps to bring together quantitative and ethnographic understandings are equally important since when research is designed to participate in a future intervention, it needs to attend to question of how what happens next will not simply be a quantified reality or shaped through interventions that are based on quantitative data. This calls more generally for deeper attention to how quantitative and qualitative methods can be better combined or mixed in future-oriented research and design projects and for a methodological research agenda that advances this. With reference to the ethical dimension, we argue that commitment to understanding what people are actually doing, experiencing, how they anticipate what will happen next and imagine their futures, and the feelings of hope or anxiety that may go with this is significant beyond its role in creating a deeper understanding of what quantitative data “means” or is complicated by. Attention to human experience, meaning and feelings should be part of a commitment to ethical accountability and this should be fundamental to the development of any methods related to big data analysis and predictive representations. Such attention involves, as the examples show, a processual ethics that is embedded in our relationships with other people and with our engagements with the complexities of the temporalities of their lives and of research.

In this section, we have demonstrated how ethics is integral to anthropological ethnography and is as such always situated and contingent. We have then shown how, when applied to a revised form of ethnographic practice that takes seriously the complexities of the temporalities of making and living with technology, ethics becomes a deep commitment to participating in things as they play out and as they have not yet played out. This means an ethics in ethnography that attends to possible futures, and to an interventional stance, rather than to taking ethical refuge in the past temporalities of ethnographic writing. It cannot cling to the predictive structures of risk mitigation that are part of conventional
institutional ethical approval committees and processes, but instead depends on the well-rehearsed anthropological commitment to living ethics as part of our ways of being with others in their lives, contemporary presents and their always immediate, as well as imagined and possible futures. This approach to futures and to being and feeling in a research process is important in a context where predictive analysis techniques based on big data are becoming increasingly prevalent. It reminds us that there are theoretically and methodologically rooted and rigorous modes of research that offer an alternative to understanding what will happen next that are quantified, objective, and that seek to control and mitigate future risk, and that instead open up to the actual uncertainty of what will happen next in ways that are productive and generative. We next discuss the possibility of bringing these together, so that a revised anthropological ethics with a future focus can have implications for shifting predictive data-driven notions of futures, or anticipatory actions, and therefore introducing new forms of ethnographic accountability into them rather than needing to be a counterbalance or point of clash, conflict, or resistance.

**Ethnographic Accountability in a World of Big Data**

In this article, we have presented a context where big data analytics, and the predictive technologies that are associated with them, have been considered by social science and humanities researchers to be ethically problematic. As the examples we have presented show, data-driven initiatives can create interventions into people’s lives that do not and cannot attend to the real contingencies of the everyday and that are perceived as based on forms of objectification and experienced as inappropriate, unwanted, and unjust. In this context, the interventions informed by big data analytics are not accountable to the people whose lives they impact on. This contrasts starkly with the ethics of anthropological ethnography, whereby the ethics of our research involves a method through which ethics is played out ongoingly and as inseparable from the ethnographic practice, and when translated into the future, focus of design anthropology invites us to think ethically about possible worlds as they are imagined and anticipated rather than as predicted.

Social scientists have already started to make related proposals that seek to improve the work of data scientists. For example, Neff et al. (2017) have proposed a set of principles that can usefully be applied when such analytics are used in interdisciplinary contexts: “(1) Communication is central to the data science endeavor”; “(2) Making sense of data is a collective process”; “(3) Data as a starting point, not end; and “(4) Data as sets of stories.” Such an approach inserts a welcome new ethics into data science and analytics. However, a deeper anthropological appreciation of futures as contingent, and a critical approach to the societal structures that frame uses of data in governance, is needed in these ethics. As we saw in examples outlined earlier in this article, when big data is used to make interventions that are oriented toward future change, such as the reduction of traffic accidents, they do not engage with the open nature of the possible outcomes of the interventions—or with what could be emergent from them. Rather they seek to achieve certain objectives through the interventions which are considered to mitigate risk. That is, while there is an ethics to risk mitigation, in that it seeks to make a better world, this ethics does not carry through in the same way that ethnographic forms of accountability do because it is conceived as part of a closed and solutions-based vision of future. When it is thought of as part of an ongoing, open, and possibility-based vision of future, it takes on new qualities and also, we suggest, requires a new form of accountability. Therefore, the four principles suggested by Neff et al. (2017) are important and viable, they offer ways to improve what we can know from data science and the ethics of knowing. However, principles for considering data-driven interventions are equally urgent, and it is here where we propose a future anthropologies approach is particularly helpful. As we have emphasized early on in this article, a revised future-focused anthropological ethnography and big data processes coincide in their capacity to encounter the world as it unfolds, their attention to futures and interventional ambitions, and their improvisatory ways of conducting analysis. This brings us to the final question of how the ethics of accountability that is embedded in method in ethnography might become part of an ethics of making and using big data.

There is of course no single answer to this question, and given our argument in this article has been for an approach that sees everyday worlds as emergent, and as such demands a focus on the creation of possibilities, not solutions, it would be contradictory to end this discussion with a solution. There are, however, particular ways forward we suggest opening up to build: (1) critical ethnographies of that provide specific examples of how existing anticipatory interventions based on big data analytics are irresponsible, of how data is improvised with, and where data becomes entangled in mundane sites of everyday life and how it becomes part of generative sites of meaning; (2) modes of doing big data analytics which incorporate an ethnographic sensibility and that ask and seek to uncover ethnographic questions; and (3) methodologies for understanding how and where data become involved in the future temporalities and imaginaries of people’s lives—that is, to ask not only how the outcomes of predictive data analytics fall into and disrupt people’s lives but to undertake future-focused research that enables better interventions. For this to happen, a design anthropological possibilities-based approach (Akama et al., 2018) needs to replace approaches that seek to create solutions-oriented conditions through which data can impact on people within scenarios that have been predicted and projected in order that they can be controlled.
Conclusion

In this article, we have sought to create beginnings rather than ends, and possibilities rather than solutions. Social scientists are increasingly undertaking rigorous ethnographic and other qualitative studies that demonstrate the shortcomings and inadequacies of big data, the ways it is analyzed by data scientists, and the problematic ways that it is engaged to drive policy and design. This means that we are now starting to see the implications of the datafication of many of our everyday activities, spaces, and organizations. These steps take us further than earlier work that had begun to reveal the problems of understanding data as objective and to call for new ways of defining the status and possible meanings of data as a form of knowledge or information. They do so specifically in calling our attention to the need for an applied and public anthropology of data that seeks to work toward the making of and opening up of the possibilities for responsible data futures. This is a task that will require interdisciplinary commitments and disciplinary self-interrogation and potentially transformation. However, it is an important one.

The kinds of projects we advocate have not yet happened, however, as our discussion suggests there is a need to develop and test out a new mode of “mixed methods,” whereby big data analytics should not be separate from ethnography (or other ethics as method approaches), where methods and ethics are inseparable and where a future-focused ethics of anthropological ethnography should replace the predictive future scenarios that emerge from big data analysis.

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