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VECTORS FOR FIELDWORK

Computational Thinking and New Modes of Ethnography¹

Anne Beaulieu

Researchers using ethnographic methods have traditionally claimed that the way methods are closely entwined with the field and objects of concern is a distinctive trait. The extent of this entwinement can vary; from co-construction, where methods, objects, field and even ethnographer emerge as part of ethnographic practice (Tsing 2005), to more instrumental versions of this entwinement, where a researcher will expect certain topics or issues of interest to become visible in the course of fieldwork (Shaffir and Stebbins 1990). In this chapter, I will propose an approach to understand accounts of methodological adaptations in ethnographic research, in order to contrast different adaptations to digital tools and networked relations within a framing of computationalization (Hayles 2002).

Readers of this *Companion* will most likely already have particular attachments to ethnographic methods. Or perhaps some might feel some reluctance to embrace these methods in their own work—or that of their students—and have picked up this *Companion*, seeking orientation to ethnographic approaches. In any case, ethnographic methods will be associated with research practices, experiences of fieldwork and immersive ways of being a researcher. Ethnographic research is predominantly discussed as a process, a way of learning through doing, rather than simply a set of methodological prescriptions and a means to an end. This is the reason why the key intellectual and cultural movements in Western academia of the past decades—feminism, post-colonialism, post-structuralism, queer theory, etc.—have meant not only a focus on new objects or a revisiting of canons, but also deep questioning of the very process of doing ethnography. As such, adaptations and reflections on ethnographic methods pursued in relation to digital tools and networked relations could be seen as one more foil, against which ethnography rethinks its value, analyzes its processes and reconsiders its contributions.

This chapter focuses on ethnographic accounts in relation to the regime of computation, defined as the import of patterns of information as a basic unit and of computers as universal

machines, a dominant cultural condition of our times (Hayles 2002). As Pink et al. (2015) highlight, ethnography has different meanings in different disciplines and these differences are represented in this volume. In Science and Technology Studies (STS), ethnographic methods—particularly participant observation—have been used to understand knowledge production. Being in the lab has been used as a strategy to document how social and cultural processes are entwined with epistemic claims, and to situate scientific activity as continuous with other cultural spheres and social institutions. Fieldwork has been invaluable to show the diversity of meanings attached to technologies and artifacts (Beaulieu et al. 2007), and to understand the transformations in knowledge production as a result of informationalization (VKS 2008). My own ethnographic practice has been shaped by STS, where co-presence in the lab (Beaulieu 2002, 2010; de Rijcke and Beaulieu 2014) has been a core strategy to understand the visual culture of laboratories and the epistemic power of informational and computational objects.

As noted, there have been crises and challenges enough in ethnography, and the approach has been reinvented and reshaped to address literary/feminist/queer turns and twists. There is, however, a particular way in which the computational challenges ethnographic work. In terms of a method where the “ethnographer is the instrument,” some of the central claims of computational regimes pose a radical challenge. Presence and engagement, two key elements of ethnographic approaches, have been formulated according to the liberal humanist tradition that links the ethnographer as investigating, learning and knowing subject to embodiment. In a computational regime, where informational patterns are privileged over material instantiations, bodies matter less and less (Hayles 1999), therefore posing a challenge to ethnographic traditions. We will return to this issue, to consider how different starting points for presence (Beaulieu 2010) and engagement (Hayles 1999; de Rijcke and Beaulieu 2014) can actually enrich rather than threaten ethnographic approaches, and how that interfaces where bodies and information meet could actually be of particular interest (Hayles 1999). For now, the point is that one important challenge of computational ethnography is that not only the methods but also the ethnographer as instrument is problematized, and that this problematization takes the form of an opposition between physical embodiment and informational modes.

Rethinking Ethnography and Digital Technology

There is no dearth of reflections, explorations and experiments in ethnography, in relation to digital technologies and networked contexts. Prominent works that have explored the feasibility and consequences of embracing these new forms abound, among which the seminal “proof of concept” *Virtual Ethnography* (Hine 2000) that put forth a number of adaptations of ethnographic methods to the Internet. Several collections on methods to study digital practices and virtual settings have included ethnographic methods as an important part of the researcher’s “toolbox” (Markham and Baym 2009; Hine 2005). Digital and networked settings and practices have been the focus or part of ethnographic research for well over a decade, even in the most traditional bastions of anthropological work. A diversity of ethnographic approaches has also widely been recognized as providing valuable insights into the study of Internet and digital culture, broadly defined. Among all this literature, richly documented across this volume, some authors insist on the continuities in cultural practices that endure into the digital (Miller and Slater 2000), while others stress the novel possibilities for human culture (Boellstorff et al. 2012).

But across this divide between those who would signal discontinuities and breaks, and those who insist on the robustness of cultural forms, all authors share a commitment to ethnographic approaches and faith in the resilience of the approach to successfully meet any challenges an

informational world might throw at it. More interesting than the potential of ethnographic methods to fail or succeed are the accounts of the value of ethnography for doing work in digital settings or with digital objects.

As widely noted, there are many different contexts and many different disciplines in which ethnography is used. But besides this diversity of theoretical frameworks and epistemic goals for ethnography, there is also a certain hesitation, maybe even a taboo, to pin down ethnographic methods too tightly. This is attributed to the openness of ethnographic approaches to its object, its potential to be adaptive, and to the iterative nature of doing fieldwork well. While there is no shortage of discussions of ethnographic methods, there is generally a reluctance to articulate ethnographic approaches in too explicit terms, a resistance to giving in to post-hoc, “just so” accounts of data gathering (see Hammersley and Atkinson (1983) and the revised introductions to the editions of 1995 and 2007). There are good reasons to fear the instrumentalization of an approach whose strength is learning by doing, of insight through experience.

Yet, while there will rarely be a methods section in ethnographic writing (with possible exceptions in some fields of communication studies and sociology), there are ways in which we transmit, communicate and debate methods. And understanding these accounts is a powerful way of following what is happening to ethnographic methods in their encounters with digital tools and networked settings. Indeed, even if method is implicit, emergent, never prior to engagement with the field, evolving across the research process and into the “-graphy” moments, there are recognizable ways of talking about method. I want to suggest that a focus on the *tropes* used in ethnographic accounts is a useful handle on the dynamics of methods. Tropes are elements of expressive language that have to do with an agreed-upon shorthand. They are different from, say, definitions, which articulate particular features of objects that situate these objects in specific spheres (Beaulieu 2016). Tropes similarly focus attention, but do so not in a lexical manner, in relation to a word, but in terms of narratives. Tropes are shorthand for common story-telling patterns that an audience will recognize and immediately understand. For the purposes of the discussion in this chapter, I consider a trope as an element used to describe an adequate ethnographic approach, open to contestation, but generally taken to be reasonable, valuable starting points.

Tropes are therefore a way to empirically anchor this analysis of changing ethnographic methods. Tropes have been used to analyze aspects of ethnographic work. For example, Rumsey looks at macro-tropes, at a level that shapes entire books. This enables him to address how ethnographies can differ in their forms and relate to differences of theoretical orientations and different forms (Rumsey 2004). Pratt (1987) has also looked at tropes in ethnographic writing to explore the relationship between ethnographic authority and personal experience and to link ethnographic writing to other kinds of writing (in her chapter, travel/explorer writing). Like these authors, I’m interested in exploring the epistemic authority of ethnographic approaches, but do so here by focusing on methodological discussions as part of ethnographic accounts. The focus on tropes enables me to embrace the narrative, contextual mode of accounting for methodological choices in ethnographic work, while being able to focus on methodological investments and changing commitments of various forms of ethnography.

Field of Tropes

A different review of recent work would reveal fields of tropes, for example, as illustrated in Figure 3.1.

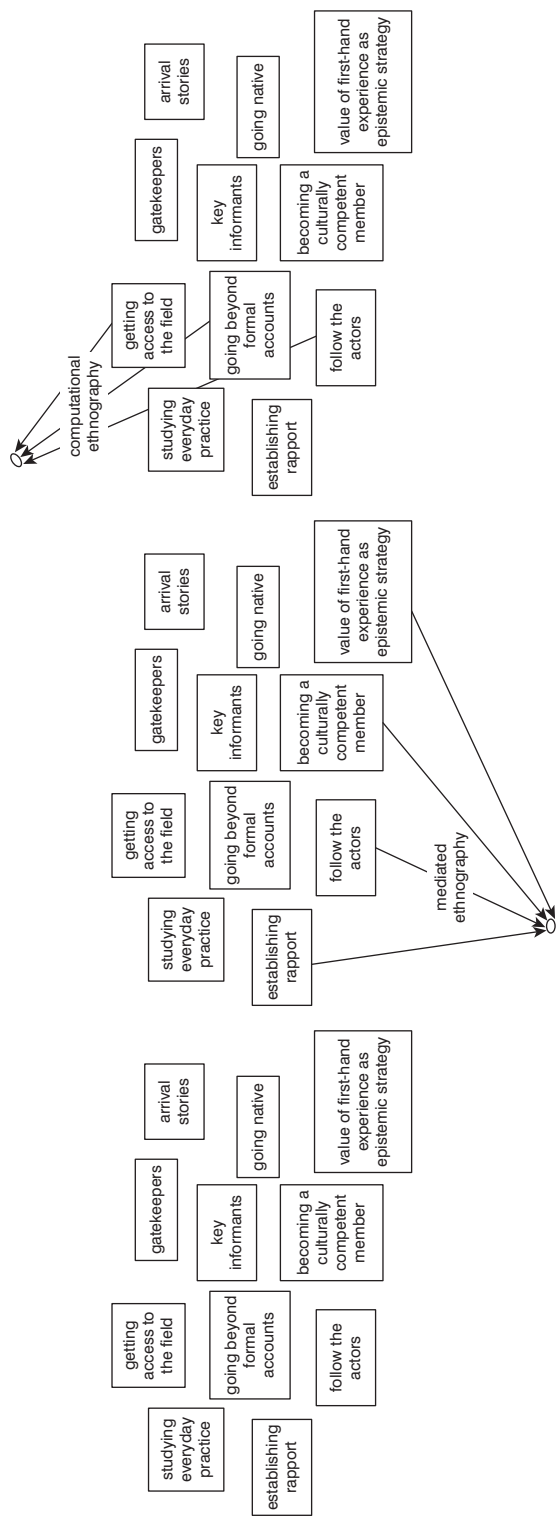


Figure 3.1 A field of tropes (left), and their relative prominence in mediated ethnography (center), and in computational ethnography (right)

Indeed, such an inventory would be a useful pedagogical exercise to underpin a discussion of methods, or as a reflexive move to consider one's own accounts. These tropes serve as ways to anchor one's commitments to ethnographic approaches and the kinds of insights they yield. Across my own work, "going beyond formal accounts" has been a recurring trope (see, for example, Beaulieu 2002), one deeply embedded in the STS tradition in which I was trained in the 1990s, where going into the lab was meant as a way to access practice.

My suggestion is that an analysis of tropes can be a useful way to understand how ethnographic work is changing. In particular, tropes can help characterize computational ethnography as an emerging approach. The aim here is to contribute to the description of computational ethnography, but also to illustrate how tropes might be a useful way to contrast ethnographic approaches. Other fields could be generated, and other vectors could be identified. For example, digital ethnography is a term that has been used to label very different approaches that place different emphasis on aspects of digital technologies and electronic networks—whether ethnographies of screens, networks, interfaces, databases, code, algorithms. The point of a field of tropes is to show how different approaches have contrasting (and partly overlapping) emphasis on different processes as both means and object of ethnography. In the rest of this chapter, I will contrast mediation and computation. The goal is not to classify for the sake of classification, but to understand how different equipment in the epistemological sense (Rabinow 2003) is part of different modes of problematization in regards to ethnographic methods.

Mediated Ethnography

From the earliest work, in computer-supported cooperative work (CSCW) or virtual ethnography, fieldwork that approaches the virtual was articulated with mediation as a major concern. Some of the worries: Can field relations be such that they provide sufficiently authentic rapport? How can the ethnographer whose participation in a setting is mediated speak with authority? What proportion of face-to-face interaction is "still" needed to count as proper ethnography? In this line of thought, ethnographers are eager to set out what happens when mediation is a prominent part of their fieldwork and field relations. Accounts stress the value of engaging with digital technologies as a way of *establishing rapport*, of *following the actors*. Accounts will also tell of the months of learning needed to *become a culturally competent* blogger or gamer. Or they will provide vignettes of "teaching moments," where fieldwork meant confrontation with their own incompetence or moments of recognition of their newly acquired digital savvy. *Being there*, in spite of mediation, or through mediation, or thanks to mediation are all shown as valuable ways of making use of firsthand experience to learn about a particular cultural setting or set of practices (see also chapter by Postill, this volume). Mediated ethnography is also concerned with the tension between analog and digital. The explorations in digital ethnography can have far-reaching consequences, for example, leading to new modes of ethnographic research, where sharing of materials and distributed analysis decenters the personae of the fieldworker (Horst 2016) or where new kinds of accounts become possible (Underberg and Zorn 2014). This tension is further discussed by Chin (this volume), and reviewed in Beaulieu (2010).

Computational Ethnography

In contrast, computational ethnography focuses not on the mediation via the digital, but on the informational dimension of Internet settings, big data and digital tools. As such, computational ethnography stands in tension not so much with the analog, but rather with the narrative, the

unfolding of events, which is central to ethnographic practice and accounts. In computational ethnography, code as an instrumental form of language, and computation (rather than representation or interaction) becomes much more prominent. Algorithmic interactions, calculation and generative potential are prominent, with consequences for being in the field and for the objects of ethnographic inquiry.

For example, for a time, hyperlinks were considered to be “authored” or intentional components that structured the web (Beaulieu 2005; Foot et al. 2003). Early approaches to issue mapping (Rogers and Marres 2000) and social network analysis also followed this approach (Wellman 2001). But as the Internet and our interfaces to it developed, new ways of structuring the web have appeared, where authored hyperlinks have largely given way to algorithms, profiling and scripts. As such, the computational aspects of code and of networks have become worthwhile objects of concern for ethnographers. Another aspect of computational ethnography is the way suites of technologies, rather than a specific application, become part of the fieldwork means and context (Hand 2008). Objects and settings of concern have a networked character, which poses particular challenges for the fieldwork. It is in meeting these challenges that computational approaches are put forth as valuable tools for ethnographers. A number of tropes can help guide us in thinking through the adaptations of computational ethnography.

Getting Access to the Field

Getting access has been a long-standing concern in ethnography. With regards to computational ethnography, what is particularly interesting is the way “capture” functions as a strong orienting concept. Computationally apprehending the field, producing one’s own archives (Marres and Weltevrede 2013) and delving into the generative potential of digital contexts (Waterton 2010) become core strategies for getting access to the field. Computational tools become a way to study the development of communities, whether in terms of their social (Arnold et al. 2010) or spatial relations (Hsu 2014; see also Burrell, this volume).

Getting access is thus formulated in terms of being able to capture interactions or behaviors of interest. For some researchers, computational ethnography offers the possibility of doing this unnoticed. The idea of unobtrusiveness, of accessing the field without disturbing it has been a recurring fantasy of some ethnographers (Paccagnella 1997). This idea was prominent in some of the early virtual ethnography writing, where being a fly on the wall seemed realizable with participant observation in mediated settings. In computational ethnography, this promise is fueled by tracking devices that map out interactions and the wealth of traces generated by informational contexts—possibly even prior to any elicitation by ethnographers (Neuhaus and Webmoor 2012). Data are collected in situ, more or less surreptitiously and without explicit elicitation (see also *Going Beyond Formal Accounts*, below).

Follow the Actors

In ethnographic projects that focus on socio-technical systems, such as virtual working environments, large-scale data infrastructures or collaborative platforms (e.g. Wikipedia, open source software), ethnographers have been exploring the power of the computational as a way to better follow the actors. There has been a range of uses of these computational tools; whether to zoom in and out (Ducheneaut et al. 2010) and deal with massively distributed actors, or to focus on how individuals find their ways into these large projects. Logging

data, for example, enables ethnographers to zoom in on specific individuals within these larger settings (Geiger and Ribes 2011). Another interesting development with regards to computational ethnography is that non-human actors might be leaving as many interesting and relevant traces as human actors in the field. Deciding which actors to follow might not be a novel dilemma in fieldwork, but computational ethnography tends to broaden the candidates in the direction of technological suites (Hand 2008).

Going Beyond Formal Accounts

The possibility of *going beyond formal accounts*, getting access to what people actually do, rather than what they say they do, is also seen as a powerful way to understand behaviors, institutions and culture ethnographically. Current discourse (for example, EU funding policy) that puts users, consumers or citizens center-stage are fueling these adaptations of ethnographic methods. Computational ethnography, therefore, seeks to identify what people might want or do or prefer, through tracing human behaviors. In addition, computational ethnography can unearth the dynamics of search engines and other algorithmic technologies and interfaces that might otherwise remain unarticulated. Ethnographers have developed software tools as ways of exploring the field, in the process also finding that these tools can act as very valuable probes to go beyond the scripts open to an embodied user, to “reach beyond the end-user experiences of technology” and to see aspects of the field revealed, such as software-imposed boundaries or structuring devices (Hsu 2014). That it would take lots of time to discover these through interrogating interfaces, or that such structuring elements would remain invisible (or at least, not explicit) to an embodied user, are put forth as arguments by ethnographers for enriching modes of fieldwork using bots, scraping scripts and other forms of automating of interaction with the field.

This adaptation of ethnography does meet with criticism from those who develop their ethnography as giving voice to human actors who may be silenced by dominant structures. Researchers who invoke this trope often do not reject elicitation (for example, photo elicitation, a well-known strategy in visual ethnography and sociology) but draw the line at using means that are outside those of the embodied actors in their fields (see Fuller (2011) for a discussion of “giving voice” in relation to ethnographic knowledge claims in an STS tradition).

Studying Everyday Practice

Another growing approach in computational ethnography falls under the label of “sensing.” The widespread presence of sensors (for example, in smartphones) seems to provide an easily available informational infrastructure for fieldwork; actors in the field will often already be in possession of sensing technologies. While this type of data may be relatively new to ethnographic data gathering, it can be related to other ways of getting close to the *everyday practices* and experiences of individuals, such as diary writing, and is often put forward as a way of enhancing, intensifying or augmenting participant observation. The possibility of 24/7 data acquisition is presented as a radical complement to (embodied) fieldwork strategies (Entwistle et al. 2013). Whereas the ethnographer’s time, attention and presence are limited, sensing approaches can capture traces across the entirety of the “everyday.”

Furthermore, given the density and granularity of the data collected, computational approaches are rather obvious ones to turn to when it comes to analyzing field notes and data from the field—data mining, data visualization and pattern recognition. These tools bring in analytic frames that may be novel to social research (Marres and Weltevrede 2013) and to

ethnography in particular, and might stretch the expertise required of ethnographers beyond what can easily be found in a single researcher. Unsurprisingly, projects that invest heavily in this approach tend to be pursued by multi-disciplinary teams.

Conclusion

This brief overview of a set of recent trends in ethnographic methods has taken tropes of fieldwork as its anchor, to address innovations that fall under the label “computational ethnography.” To end, it is worthwhile to reflect on the epistemic and political issues that can be associated with this approach to fieldwork.

First, let us contrast once again the issues that ethnographers themselves may raise. With regards to mediated ethnography, issues such as the validity of interacting with informants by email, the quality of rapport established in a virtual world or the authority of the ethnographer’s web presence tend to be prominent. For ethnographers reflecting on how they can come to know by embracing computational methods, concerns about what is being filtered in/out by algorithms, or regarding the different ways in which platforms shape participants’ experiences and promote particular kinds of social and cultural expression are more prominent. The promise of enhancing access to the everyday, and of capturing experience and behavior at a very fine level of granularity in order to enhance participant observation, fuels efforts at deploying sensing to extend observation of the everyday. The ethnographer might remain central as epistemic instrument, but it is a version of the ethnographer as distributed, interfaced—one suited to doing fieldwork in a post-human setting.

A focus on traces and infrastructures, rather than on mediation, tends to bring in different kinds of formalizations to ethnographic work (Beaulieu et al. 2007; van Zundert et al. 2011). The importance of traces might not only shift the forms in which ethnographies are circulated and shared, but they could also change the relative importance of humans and non-human actors in the field. Such trends have been noted by Tironi and Sánchez Criado (2015) in the context of “intelligent urbanisms” (a label used to denote “smart city” activities), where it is assumed that human and non-human actors all have the potential to generate traces that can be perceived as patterns or metrics. As noted above, such assumptions might meet with critique or even backlash from ethnographers who fear the overvaluing of traces, especially when it is felt that these are not accessible to the actors in the field, and that they might detract from a commitment to *giving voice* to human actors.

Another implication of the importance of traces in computational ethnography is that it brings ethnographic work closer to other spheres. Again, to take the example of smart cities as a trend where grassroots, governmental and corporate activities all come together (Tironi and Sánchez Criado 2015). The same could be said of other areas where sensing and big data practices dominate: computational ethnography comes to share major elements with marketing (Center for Media Justice et al. 2014), political campaign strategy (Nickerson and Rogers 2014), and share in the promise of a better public life (boyd and Crawford 2012). As such, ethnography comes to be highly familiar, leaving behind the trope of travel to faraway places and access to spheres unattainable for the reader (Pratt 1987).

Besides changes in the landscape of ethnography given an increased contiguity of “the field,” the timescape of ethnography may also be changing. Whereas ethnography was typically research with a fairly long cycle, where period of travel, immersion in fieldwork, writing up of notes, analysis and the production of a monograph typically spanned years, the use of computational tools could provide the basis for a different time cycle in ethnographic work. Marres and Weltevreden (2013) term this “liveness,” the ability to do more real-time data

analysis and sharing. Whether this will lead to more superficial research, or to more responsive and accountable research, or both, remains to be seen. On the one hand, being able to provide social scientific insights into rapidly developing phenomena (weather emergencies, epidemics) could be a powerful tool to respond to crises. On the other hand, issues regarding accountability of researchers due to the nature of the data (from commercial services/for research), its scope across platforms and over time in a context of “massified data” (Neuhaus and Webmoor 2012) may be further exacerbated by liveness.

As ethnographers may be increasingly investing in speeding up the responsiveness of their work, and in sensing, harvesting and capturing of field traces, the mutual constitution of fieldwork and of the field remains a valuable concern. Sensors, like any other ethnographic device, must rely on infrastructural layers and histories of constitutive entanglements. Patterns of interaction with specific information infrastructures matter for using them effectively (Almklov et al. 2014). Since the situatedness of computational ethnography might be one that links informational practices to interfaced, post-human fieldworkers (on their own or more often than not in a networked team), it remains important to understand these practices of knowledge-making in relation to the traditions of ethnography.

Note

- 1 Discussions on this topic with participants of a seminar at the Swedish School of Library and Information Science on December 16, 2016, Borås University, Sweden were helpful in clarifying the points discussed here.

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