Article	**Integrating subjects:** Linking surveillance experiences to social patterns using ethno-epistemic assemblages

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Abstract

Surveillance can be experienced in a variety of ways, but how these experiences might be linked to broader social patterns is currently underdeveloped. There is a growing body of research exploring the surveillance subject and how individuals may (dis)engage with surveillance practices. This includes (but is not limited to) surveillance as a bargaining process (Pallitto 2013), counter surveillance activities such as sousveillance (Mann, Nolan and Wellman 2003), and surveillance as a process of exposing subjects (Ball 2009). But while shedding light on the experiences of surveillance subjects, how these experiences might be placed in relation to broader social and surveillance structures is not always automatically evident. This paper presents an initial engagement with this topic, and suggests that a possible angle for linking surveillance subjects to broader social patterns may be achieved through concepts from science and technology studies, specifically Irwin and Michael's (2003) concept of the ethno-epistemic assemblage (EEA). The EEA is a theoretical heuristic originally envisioned to help understand the blurred relationships between science and society, emphasising the heterogeneous composition and relationship of technoscience and society. The EEA specifically links an individual's contexts (ethnos), and the forms of knowledge relevant to their contexts (episteme), into assemblages, highlighting the interwoven, dynamic, and fluid nature of ethno-epistemes against and in conjunction with other EEAs, and other social narratives. A brief exploration of the marginal positioning of surveillance subjectivities is presented, followed by a detailed description of the EEA, and how it may contribute to structuring and placing the complexities of surveillance subjects in society.

Introduction

As surveillance practices become increasingly prominent in modern society, questions about the interplay between individual lives and surveillance structures are raised. Specifically, what is the relationship between individual perspectives and experiences of surveillance, and those structures that conduct surveillance? "As the systematic attention to personal detail" (Lyon 2007: 14), surveillance occurs through a variety of systems in modern society (Haggerty and Ericson 2000: 608). Many examples are found in the social structures and technical infrastructures of society, such as through regimes of state sponsored surveillance or consumer data collection (Wood et al. 2006). Just as it is unreasonable to suggest that the growing array of surveillance structures can be understood under any one logic or rationale, it is also unreasonable to suggest that surveillance can be understood as being uniformly experienced. There is a growing body of literature that highlights not only the multiplicity of surveillance practices, but also the multitude of ways surveillance can be engaged with by subjects. For example, surveillance subjects have been found to purposefully adopt and use surveillance as a part of (post)modern social relationships (Albrechtslund 2008; Marwick 2012), especially through the use of social media services (Trottier 2012). These unique experiences and interactions with surveillance obviously occur as a part of broader social and surveillant contexts. Yet the way that individual presentations of surveillance, and their associated

structural contexts, are understood and related to each other is often unclear or obscure. Thus the question remains as to how surveillance subjects are understood in relation to surveillance structures.

This article presents an initial engagement on this question. It suggests that in the study of surveillance it may be fruitful to use what Irwin and Michael (2003) call "ethno-epistemic assemblages" (EEAs), in order to better understand and relate surveillance structures (techniques and practices), and associated individual perceptions. The concept of EEAs draws upon literature from science, technology, and society (STS) studies, and the public understanding of science (PUS), where researchers have for some time grappled with how disparate views on a social phenomenon (mainly scientific and technological knowledge) can be understood. Within this field there has been a tension between institutional and structural perspectives (experts and institutions of science and technology), and individual or community viewpoints (lay persons and non-experts). Michael and Brown (2005: 433) suggest EEAs act "as a heuristic tool through which to investigate the shifting inter-relations—the differentiations and interminglings—between science and society". By focusing on understanding the heterogeneous relationships that make up social phenomena (assemblages), and how these are mediated by situated beliefs and knowledges (ethno-epistemes), institutional and individual viewpoints can both be examined and understood.

The value of this approach to surveillance, and the core of the argument presented here, lies with the ability of EEAs to focus on the relational, dynamic, and heterogeneous constitution of contemporary surveillance. As will be discussed below, the study of surveillance has often aligned into an individual/structure binary, with the focus often being on structural or top-down perspectives of surveillance, while not capturing individual or bottom-up perspectives. As Smith (2015: 11) describes, this has resulted in a situation where "personal accounts and circumstances [of surveillance] are often indirectly assumed rather than empirically solicited. Black boxed, or deliberately trivialised, in these representations is a sense of the contextualised social meanings that those actually involved in exposure practices ascribe to their embodied repertoires and inhabited milieu". By considering surveillance as an EEA, where situated beliefs and knowledges modulate and define relationships within a heterogeneous assemblage of factors, the relational and contingent quality of surveillance practices to surveillance experiences is highlighted. The individual/structure binary is reframed as a set of heterogeneous relationships and assemblages, with all forms of knowledge or belief understood as valid and crucial in the presentation of surveillance. By focusing on these relationships and their components, EEAs avoid becoming trapped in pre-existing and possibly problematic social concepts (like the individual/structure binary) to understand surveillance, and also avoids reifying the existence of these concepts. As others have already indicated, surveillance is increasingly being recognised as dialectical and relational in nature (see French 2014). What EEAs provide to this is a methodological concept and analytical tool that can be applied to examples and analyses of surveillance, helping to avoid the blackboxing that Smith describes at a methodological level.

The first section of this article presents a brief summary of the top-down/bottom-up binary between individuals and structures in surveillance. Following this, the background of EEAs is introduced, focusing on how parallel debates in STS and PUS (around top-down/bottom-up binaries) have prompted alternative responses like EEAs. The EEA, and the relational approach it provides, is then explored in some detail. Finally, a brief example is presented to demonstrate how EEAs can be applied to empirical data.

Surveillance Binaries

There are a multitude of surveillance practices, techniques, and methods being employed in society. Historically surveillance has been a crucial aspect of modern bureaucracies and organisations (Dandeker 1990). With rapid developments in technology, especially information and communication technologies (ICTs), surveillance has grown and diversified in contemporary society. As Wood et al. (2006) note, surveillance measures carried out regularly on citizens by businesses and intelligence services include

Closed Circuit Television Cameras (CCTV), electronic tagging, biometric scanning, and mass data collection and analysis of personal information. This has expanded to include surveillance opportunities facilitated through mobile technologies and devices (Caushaj et al. 2013), drones and unmanned vehicles (Wall and Monahan 2011), and consumer level personal surveillance devices (Humphreys 2011). These forms of surveillance require significant resources, and thus surveillance is often thought of as being instituted by state authorities (see Lee and Cook 2015). In 2015, these concerns are continuing following information disclosed by WikiLeaks and Edward Snowden. Government programs such as PRISM, and intelligence organisations like the US National Security Agency (NSA) and UK Government Communications Headquarters (GCHQ) continue to highlight the role of the nation state in surveillance. This thriving personal economy of information (Pridmore 2012) has seen mass surveillance now being further undertaken by corporation and private business. Surveillance is not at all new to bureaucracies and private businesses, and has a long history (for example see Beniger 1986). In the digital age the scope of private surveillance has grown dramatically, as information technologies become entwined in everyday life. Internet heavyweights such as Google (Andrejevic 2009), and Facebook (Trottier 2012), collect the personal information of users and sell these to advertisers. This is not a new phenomenon either, with Gandy (1996) describing how personal information was used to target and exclude potential customers long before the internet revolution. Not only are consumers and individuals subject to surveillance by private enterprise, but workers themselves are increasingly subject to surveillance while on the job, with their personal and biometric data being used overtly and covertly within organisational contexts (Ball 2010). With modern ICTs the trade in personal information has grown exponentially, with analysis of Google's network infrastructure suggesting at least one million gigabytes of personal information are collected through normal operations (Chang et al. 2008). Today, the scale and scope of data collection and analysis is huge, often conceptualised under the moniker of "Big Data", an industry devoted to analysing and using enormous data sets to leverage previously unavailable statistical insights (Mayer-Schonberger and Cukier 2013).

These surveillance practices and patterns are similar in that they represent a structural patterning of surveillance, originating from institutions, organisations, and infrastructures whose surveillance practices flow down through society to intersect with the lives of individuals. This kind of analytical grouping suggests the surveillance is hierarchical and asymmetrical. Social structures have the power and capacity to initiate and apply surveillance upon individuals (or groups of individuals) in a way that is not easily reciprocated. However, in recognising this it is also important to note that not all surveillance comes from the top down. Haggerty and Ericson (2000) have argued that recent developments within surveillance may suggest diminishing hierarchies of surveillance. They argue that the proliferation of consumer surveillance technologies, like video cameras and the internet, and the intense focus that the media places on institutions, indicates the appearance of a less hierarchal pattern of surveillance, a part of what they call the surveillant assemblage (discussed in greater detail later). The recognition of how contemporary surveillance is not exclusively hierarchical is not only hinted at in theory, but also through the growing body of research exploring surveillance behaviours that originates from the individual, from the bottom-up.

With surveillance penetrating many aspects of everyday life, it is hardly surprising to find that individuals are showing various forms of (dis)engagement with surveillance. The same technologies that have facilitated mass surveillance have also normalised and facilitated surveillance instigated by individuals. For example, while social media acts as a form of mass data collection for companies and governments, users themselves are able to conduct interpersonal regimes of surveillance, described by some as social surveillance (Albrechtslund 2008), participatory surveillance (Marwick 2012), or lateral surveillance (Andrejevic 2005). These surveillance patterns are not just a response to new forms of technology, but indicate the emergence of social, cultural, and behavioural patterns initiated by users. With mobile technologies linked to these services, events can be immediately shared or recorded (Ahern et al. 2007), giving users unparalleled opportunities for conducting their own surveillance upon others, including

institutions (Ganascia 2010). Alongside the continuing popularity of reality television (Andrejevic 2002a), these devices and services have contributed to user orientated surveillance projects. This includes using technology to expose and reveal the self in the public domain as entertainment. Smith (2012) describes this as a part of revelation culture, where the exposure and visibility of the self is a desirable and accepted part of social engagement. It is accepted, and in some cases encouraged, to make oneself visible to surveillance, whether this is for some form of personal gain (Andrejevic 2002b) or as a part of daily social interactions (Ball 2009). Thus surveillance is increasingly present not only as a structural and top-down phenomenon, but also as an individual and bottom-up one, featuring a different quality and character compared to the structural.

This differential presentation of surveillance, where the quality and character of surveillance varies between its top-down origins and its bottom-up enactments, has been more recently noted by several scholars. For example, in exploring the surveillance practices of the Canadian public health system, specifically those relating to digital health records and surveillance programs, French (2014) finds that surveillance is heavily mediated and institutionally defined. In the Canadian health system, data collection practices are shaped by what he calls "the informatic ethos", or faith in data that avoids recognising the labour of making data systems work. What is obscured is the informatic practice of healthcare, the actual labour of humans and nonhumans in making digital systems work, and of conducting surveillance. Within these practices there is significant room for what French describes as "mutations of the gaze", where the institutional surveillance process (originating from the top down) is reframed by those involved in the informatic practice of surveillance (at the bottom). For instance when discretion on an illness is required "public health professionals must negotiate the occasional tension between their responsibilities to patients, and their responsibilities to protect the public" (French 2014: 238), with the quality of surveillance work changing depending on how these responsibilities are conceptualised. Smith (2015) presents a similar example of variability in the field of CCTV surveillance, exploring the position of CCTV operators in conducting the work of watching and supervision. He finds that such "supervisory work" is "fraught with complexity, reflecting the fact that camera workers have an ambiguous relationship with the technologies of vision and fields of visibility for which they are ultimately responsible" (Smith 2015: 160). This ambiguity and complexity results in a highly nuanced application and mediation of not only the CCTV surveillance system, but also of the subjectivities of surveillance workers themselves. The variability in surveillance practice and experience is further noted by Andrejevic (2002b) as relating to online consumer surveillance, in Ball's (2001) study of computer based performance monitoring, and in boyd's (2014) assessment of young people's negotiations around surveillance.

Two important issues are highlighted by the above arguments. First, that there are enormous variations in surveillance across contexts, practices, and experiences. Second, that these variations originate dually in society from the top-down (through surveillance structures), and from the bottom-up (via the individual). There is also a growing recognition of a relationship between these perspectives. No individual surveillance experience is isolated from the structural threads of surveillance infrastructures and institutions, and no structural surveillance project is without intersections with individual contexts. However there is as of yet no clear direction on how individual and structural perspectives maybe linked (see Ball 2009). Thinking of surveillance in terms of the individual/structure (top-down/bottom-up) binary persists. What is therefore needed is a better consideration of how surveillance is related, and of how the many threads—both structural and individual—interact and form patterns within a context.

Ethno-Epistemic Assemblages (EEAs)

One possible approach for achieving analytical clarity between individual and structural patterns can be drawn from the work of Irwin and Michael (2003), and their concept of ethno-epistemic assemblages (EEAs). This approach is drawn from social science disciplines that have critically examined scientific and technological knowledge—henceforth referred to as techno-science (Michael 2006)—such as STS,

PUS, and the sociology of science. These fields have encountered a similar situation to Surveillance Studies in trying to unravel the binary between individual and structural perspectives, and explore their relationship.

This situation has revolved around the distribution and creation of techno-scientific knowledge. Historically such knowledge was thought to be the sole domain of scientists, powerful scientific and social institutions, and the specialised methodologies used by these groups to create knowledge. Thus the beliefs of experts and expert institutions were deemed to be the most valuable, and the only correct viewpoint for examining techno-scientific matters. The views of non-experts (i.e. everyone else) were excluded and downplayed, creating what Irwin and Wynne (1996) call the "deficit" model between institutions and non-expert individuals and communities. The outcome of such beliefs was the marginalisation of the public in favour of expert viewpoints. This logic manifests itself in governance and scientific policy, and in debates on techno-science issues such as outbreaks of what is colloquially known as "Mad Cow Disease" (Wright and Nerlich 2006), with the voices of the scientific institutions asserting the "facts" and suppressing dissenting individuals and groups. While this approach could be sufficiently true if techno-science was somehow completely separate from society (as earlier sociologists suggested—see Merton 1973), the reality is that techno-science is deeply entwined in the everyday lives of citizens, and is a matter of public concern and interest. The relationship here between the public and techno-scientific experts parallels what has occurred in Surveillance Studies; namely that different viewpoints on a social phenomenon form, some originating from the top-down (such as those espoused by scientific institutions and experts), while other emanate from the bottom-up (the views of non-expert individuals, groups, and communities). These perspectives are related and linked, but unfortunately are not well integrated in discussion on the issue. In the case of techno-science, this lack of integration produced a great deal of friction.

However a number of critiques against the deficit model, and those scientific and governmental institutions who have adopted it, have eroded its prominence and led to new modes of thinking about techno-science. For example, expert and institutional claims that only they possess legitimate knowledge on techno-science have diminished with the growing number of empirical studies that detail how individual and non-expert viewpoints mediate techno-science (Wynne 2014; Blue and Medlock 2014). These studies point to the dialectic relationship between techno-science and society, and as Haraway (1988) argues, the need to understand knowledge as being "situated" in social contexts. Techno-science does not just flow from the top down, but is performed by all levels of society. The acceptance of this relationship also opens the door to recognising the heterogeneity of techno-science. As Burns et al. (2003) and Michael (2009) have pointed out the "public" is not unified but a heterogeneous mixture of individuals and groups with their own agendas and experiences. The public therefore cannot be treated as a unified body of individuals, given that there are many different *publics* with their own viewpoints worthy of consideration. Instead, a diversity of views, relationships, and resources must be considered when understanding techno-science. As a consequence of this dual recognition of heterogeneous publics and their dialectic relationship, there has been an "ethnographic turn" in science studies to explore this, moving away from assumptions of deficit towards engaging with individual perspectives and practices around techno-science. This shift is represented in changes in techno-science policy, with the notion of "scientific citizenship" (Irwin 1995) or an active engagement and relationship between formal scientific knowledge and the contextual knowledge of citizens, becoming popular. Although these and other exercises in engagement such as public participation (Felt and Fochler 2008), and deliberative democracy with science (Hagendijk and Irwin 2006), are not without their problems, they represent an ongoing project to probe the relationship between the heterogeneous groups implicated in techno-science organisation, and consider the importance of both individual and structural viewpoints in their analysis.

The ethno-epistemic assemblage is one of the theoretical and analytical frameworks developed as a product of the ethnographic turn. It is designed to engage with the varied compositions of, and relationships between, social phenomena, such as those present regarding techno-science (Irwin 2006:

303). As the above discussion indicates, techno-science is increasingly recognised as varied and heterogeneous, involving disparate practices, resources, actors, techniques and relationships (Scott and Du Plessis 2008: 110). How these many different factors come together to form working entities, that perform social action (political, scientific or otherwise), thus becomes the target of social analysis, with the EEA suggested as a means of engaging with these many factors. Irwin and Michael state that:

> ... [the EEA's] function is as a heuristic: it is a tool with which to explore how such heterogeneous groupings might be characterized. Ethno-epistemic assemblages are meant to aid us in examining how such 'odd' mixtures come together, cohere and 'work' as a, perhaps, unitary or singular actors...
>
> (Irwin and Michael 2003: 113)

By providing tools that grapple with the heterogeneity of social phenomena and organisation, and the dynamic relationships that are formed in getting these many different elements to work together, Irwin and Michael suggest a way in which individual and structural viewpoints might be both considered in the same analytical light. Although this approach has largely been the focus of techno-scientific disciplines, the ideas and principles that the EEA brings are perfectly suited to Surveillance Studies given the similar issues and histories discussed thus far.

The first idea Irwin and Michael employ is Deleuze and Guatarri's concept of the assemblage. An assemblage is a representation of multiplicity and heterogeneity, a non-hierarchal, constantly fluid network of disparate objects and associations—it is "rhizomatic" (Deleuze and Guattari 1988: 6-7) like a system of roots. Deleuze and Guatarri's philosophy emphasises the importance of multiplicity and heterogeneity in understanding reality and society. Their psycho-analytical approach suggests that the innate motivation of people and society, their desire, is that of infinite possibility and multiplicity (Carter and Jackson 2004: 108), of constantly becoming something rather than achieving a fixed state. Assemblages are expressions of this. They are temporally bounded spaces of associated multiplicity, unified as satisfying this desire. They are not stable, but fluid and constantly becoming. Following from this, there exists an infinite number of "lines of flight" (May 2005: 128), or the possible directions in which the multiplicity may progress and change. Aspects of an assemblage may spin away, forming a new assemblage, in a process of territorialisation and deterritorialisation, or the dynamics of how spaces of similarity form, change, and move on. Such a philosophical position is highly complicated, and a detailed exploration would require another article. But what the assemblage concept contributes analytically is a framework that embraces the messy mixtures and relationships of social phenomena (science, surveillance, or otherwise), highlighting the importance of conceptualising the relational and dynamic qualities of these parts. As Deleuze and Guattari (1988: 4) state, an assemblage is defined in relation to other assemblages. There is no innate essence or internal definition to an assemblage, making understanding their relationships to other assemblages crucial. The concept of (de)territorialisation highlights this in the analysis, but is further enhanced by considering the "machinic" or the multiple elements of the assemblage, and the "enunciatory" or how different elements communicate within and between the territories of an assemblage. Additionally, the focus on relationships in defining meaning avoids reification of the phenomena, and also essentialism. Thus using assemblages provides a rich conceptual tool kit for consider multiplicity and relationships, and is therefore well placed as a part of an EEA.

Assemblages have been used before in Surveillance Studies, most successfully by Haggerty and Ericson (2000), who describe the existence of a surveillant assemblage in analysing contemporary surveillance trends. For Haggerty and Ericson, the concept of assemblages is used to capture the expansion and diversity of surveillance practices in contemporary society. They suggest that the will of the surveillant assemblage is "to bring systems together, to combine practices and technologies and integrate them into a larger whole" (Haggerty and Ericson 2000: 610). An important part of this is the focus on the individual's

body. They suggest an individual's personal data, movements, and habits, are liberated from their embodied existence through various surveillance and technological systems that create records, traces, and other forms of data (Haggerty and Ericson 2000: 606). These flows of data come to represent and visualise the individual as a "data double", a virtual representation concerned more with analysis and comparison between populations (Haggerty and Ericson 2000: 613-4), than of the embodied individual's personal identity (Hier 2002: 402). The surveillant assemblage has proved quite productive and influential in Surveillance Studies, and interestingly shares a similar theoretical background with the EEA through the concept of assemblages.

The EEA is also quite distinct, and is sensitised through debates in STS that have yet to occur in Surveillance Studies. As discussed above, the EEA is broadly concerned with "odd" and heterogeneous mixtures in society, such as those between society and techno-science, thus it has a more explicit interest in the territorial aspects of the assemblage. The heterogeneity of the assemblages extends beyond the component parts of one social trend (like surveillance and its practices), to include the logics and knowledges that are used to justify and understand the assemblage itself, occurring both at structural and individual levels. The heterogeneity of a phenomenon is not limited to its practices or elements, but extends to include the concepts and rationales of the assemblage itself, including its heterogeneity. Surveillance can be thought of in the same way. There are multiple viewpoints and forms of knowledge around surveillance, being co-constructed through a variety of different actors, elements, resources, and forms of knowledge, that come together in a variety of ways. Surveillance exists as a hybrid between many different elements. While Haggerty and Ericson (2000: 611) acknowledge that the processes of surveillance may be hybrid through blurring the physical body and data double, they do not recognise the hybridity of surveillance itself in the overall desire of the assemblage, and in its related processes, concepts and logics.

This difference between the EEA and the surveillant assemblage is particularly clear when considering Haggerty and Ericson's view of the individual. On the one hand they suggest that surveillance within the rhizome has transformed hierarchies of observation, and allowed for the scrutiny of the powerful by both institutions and the general population (Haggerty and Ericson 2000: 617). This implies a more active and integrated part for surveillance from the bottom-up. However, the individual is also severely limited. The focus is not on individuals as agents, contributors, or participants in surveillance, but merely as vessels for flows, waiting to be extracted from an embodied human agent. The individual's importance in the surveillance assemblage is more about the data-double's representation of the individual, rather than the embodied individual. Resistance, acceptance, participation, or any other form of (dis)engagement between the surveillant assemblage and the individual is irrelevant when the focus is on how the embodied individual comes to be represented in digital form, and not through their embodied contexts. This makes complete sense under the governing logics of the surveillant assemblage, and the empirical basis for them is strong. However this is not the *only* desire, rationale, logic, or form of knowledge relating to surveillance. The surveillant assemblage does not offer an explanation or analytical space for considering the individual's context or experiences, only recognising them to the degree they can be broken down as flows and incorporated into the assemblage.

EEAs are thus distinctive because they allow multiple views to be considered and explored through the "ethno-epistemes" of an assemblage. The ethno-epistemic aspects of the EEA refers to the situated realities and knowledge that a group or individual uses to make sense of the world. They are the situated truth claims, the meanings and rationales behind the desire of an assemblage, the processes that frame the relationships, territories, and lines of flight in an assemblage. Assuming public(s), individuals or groups to be in deficit and attempting to force knowledge from the top down onto a group or actor ignores their embodied knowledge, and assumes that only one rationale/desire exists. This mirrors the issue regarding surveillance, where individually orientated surveillance perspectives are ignored. Because the EEA assumes that knowledge is heterogeneous and formed in relation to different groups (that is as a part of the

assemblage), it paves the way to recognising and analysing a variety of viewpoints and experiences, through recognising the presence of ethno-epistemic elements. As Haraway (1988) has argued, all forms of knowledge, whether institutional or individual, are produced and understood in specific localities and contexts, interspersed with cultural and experiential factors. For example, Scott and Du Plessis (2008: 114) demonstrate how cultural beliefs and experiences of genetic illnesses come to interface with institutional medical knowledge, and shape the potential actions of sufferers. It is not important to what degree such ethno-epistemes are "real" to other groups, or verifiable by "objective" measures, they are real in the sense that they shape the reality of those groups who hold these beliefs. Other examples of EEAs in practice that emphasise this can be found in Blok's (2011) analysis of whaling politics and how different situated knowledges are evoked in justifying different positions on whaling, and in the different rationales that Horst (2007) suggests science professional use to understand their work and its future.

In terms of practical application, EEAs are quite fluid. They are not a method and do not suggest how data maybe collected, but do offer methodological components to a research project. As Irwin and Michael (2003: 113) describe, EEAs are tools or heuristics, and do not specifically define a step by step methodology. This fluidity has led some to negatively evaluate the capacity of EEAs to deliver results (Chilvers and Evans 2009: 359). Also, approaches that adopt post-structuralist ideas like assemblages are often compared to Actor Network Theory (Latour 2005), and are subject to related criticism, including unduly cumbersome description (Winner 1993) and a lack of a rigorous method (Bloor 1999). While sharing some similarities with Actor Network Theory, EEAs are distinctly different. They are a tool for capturing hybridity and relationality in social phenomena and not an overarching epistemological approach. The methodological rigour and capacity of EEAs has also been addressed through numerous successful implementations, as both the primary methodological frame, but also as a general analytical concept. EEAs have been successfully used as the primary methodological basis for some research, such as Allgaier's (2012) study on science discourse around creationism in UK schools and in Horst's (2007) examination of how gene therapy is represented. Horst used EEAs as the primary means "for the study of publics due to the emphasis on heterogeneity and fluidity" (Horst 2007: 158). Because of their fluidity, EEAs are flexible to the needs of the analysis. For example, Horst's study focuses on representations of the future described by scientists, examining how different enunciations produce different assemblages on the topic. Allagaier's approach is entirely different, focusing more on the coalitions that different ethno-epistemes form to argue their case. As these examples demonstrate, the productive capacity of EEAs is linked to their flexibility in application, making them different from approaches with more clearly defined and prescriptive frames like Critical Discourse Analysis (CDA) or grounded theory approaches (Liamputtong and Ezzy 2005), whose methodological principles are pre-defined (such as the micro, meso, macro distinction of a CDA analysis). EEAs may also be easily attached to existing methodological frameworks and approaches in order to emphasise the importance of heterogeneity and relationality. For instance EEAs are used by Scott and Du Plessis (2008) to capture the rationales that different groups have around medical interventions, with data drawn from focus groups, and Plesner (2011) adopts EEA principles in developing sensitivity and reflexivity for researchers while interviewing. Thus there are few hard rules about how EEAs may be applied, albeit that they allow heterogeneous phenomena, associated relationships, and their situated knowledges to be explored in some coherent manner.

In sum, EEAs provide a tool for analysing social phenomena in a way that emphasises relationality and heterogeneity, and can be helpful in understanding individual and structural viewpoints on surveillance. The use of Deleuzian inspired concepts such as assemblages, territories, and lines of flight, provides the tools for accounting for heterogeneous elements and relational dynamics, while the focus on ethno-epistemes draws attention to situated beliefs and desires that mediate these relations in a way that has not been previously done in the study of surveillance. By adding these tools to one's analysis of surveillance, individual and structural viewpoints can be integrated.

EEAs in Practice:

With the conceptual details of the EEA present, this final section provides a preliminary example of the EEA framework in practice, and demonstrates how this heuristic facilitates a more nuanced analysis of individual and structural viewpoints on surveillance. This section presents primary data drawn from the author's research on user experiences and perceptions relating to mobile and information technologies, as an example of EEAs in practice. For the purpose of the wider research agenda, this research focused on the latest generation of mobile devices (smartphones/tablets etc.)—which merge digital and telecommunication network access, multimedia abilities, and the capacity to run applications (or novel pieces of software)—and are conceptualised as "convergent mobile technologies" (see Lee 2013). Devices within this category include the latest generation of smartphones (for example the Apple iPhone and Samsung Galaxy), and tablets (such as the Apple iPad, iPad Mini, and iPad Air, or the Samsung Galaxy Tab or Note). It is not shared in order to provide a complete or full analysis of the data-set, or as suggestive of the research project as a whole. Instead, it is used only as an in principle demonstration for the EEA concept.

The project's research question explores what role these technologies have in the lives of users, and how these roles are negotiated as a part of living as a modern person. The sample consisted of ten females and twelve males, aged between 25 and 65, living in the north of Tasmania (an Australian state), with data being collected through repeat semi-structured, in-depth interviews. General topics explored in the interviews included the adoption of technology, the benefits and risks of use, and how the devices were used in everyday life—with significant flexibility given to exploring topics that participants raised in the course of the interviews. As a qualitative study, purposive sampling was employed, targeting affluent users of these technology. This was done in order to gain access to the richest sources of data on technology use. Research indicates that individuals with middle to high incomes display broader ranges of technology use (Mackay 2012), show more interest in technology (Horrigan 2009), and are more willing and able to integrate technologies into their lives (Ames et al. 2011)—thus making them desirable for this study. Affluence was determined by participants' annual disposable household incomes. The threshold for affluence was set at $100,000 AUD a year or greater, a standard found in previous studies on technology use conducted by the Australian Communications and Media Authority (2008) and Pew Internet Research Centre (Horrigan 2009). Recruitment was carried out by gatekeepers who specialise in the sale, set-up, and maintenance of mobile and digital technologies, and through advertising materials such as social media postings, press releases and flyers distributed at sites linked to technology sales. Data was analysed using a thematic analysis following Green et al.'s (2007) method for best practice, and drew heavily upon the EEA framework to sensitise and structure the development of themes and their organisation. The limitations of the study include a small sample size and qualitative approach, precluding the representativeness of the results to the broader population. Again however, the purpose of the data presented here is not an in-depth exploration of the data-set and the research project itself, but as an example of how EEAs provide theoretical tools for linking individual and structural perspectives on surveillance. It is given as a brief example and demonstration only.

The main value of using the EEA is that it provides a conceptual language that gives equal analytical weight to individual and structural accounts, linking individual and structural trends on a social phenomenon like surveillance. This is achieved by focusing on the relationships between heterogeneous resources, and the kinds of knowledge evoked from these. For example, in response to a question about surveillance, Roger, an early career academic, made the following statement:

> Roger: I guess I'm somewhat aware of this surveillance, potentials and actualities of these technologies. And I'm aware of it in everyday life I suppose how we constantly giving up to others about ourselves. You know, from your surfing

> practices on the web, whether it be on your phone or whatever device to loyalty cards in supermarkets to you know, whatever.

Roger's statement on surveillance can be understood as suggesting a particular EEA on surveillance, a fluid but temporarily bounded space of associations and relationships he understands to be relevant (i.e. an assemblage), with this space and its relationships mediated by his beliefs and experiences (i.e. an ethno-episteme). More specifically, he describes a number of different practices, techniques, and examples of surveillance that he feels penetrate his everyday life, such as using the internet or his phone, and shopping using loyalty cards. All these are machinic elements of the assemblage, the heterogeneous elements and resources that come to be associated with his surveillance perspective. The focus on multiplicity means that one need not focus on one discursive, material, or semiotic element in understand someone's position, but instead anything a participant raises can be included. As Horst (2007) indicates, this can be difficult to manage practically, as one can be presented with an unmanageable mess of flows to analyse. But as she elaborates, this problem can be solved by focusing on understanding the particular context of the assemblage, and the central idea behind the flows—which in this case are ideas on surveillance. This particular context is further narrowed in consideration of the ethno-epistemic aspects of the assemblage. The machinic aspects of the assemblage are temporarily held by a common thread that satisfies desire. It is this satisfying desire that the ethno-epistemic seeks to tease out, as the situated knowledges and beliefs that temporarily bring order to the assemblage, and mediate its relationships and heterogeneity. In Roger's case, his situated beliefs around surveillance reflect deference and acceptance, that he is aware of and unconcerned by surveillance. Thus Roger's perspective can be understood as a collection of heterogeneous elements, bound (for now) by a common situated belief in these elements, relating to a lack of concern.

Roger's EEA is not described in isolation, but as described above is defined in relation to other assemblages, and therefore these relationships must be considered. Typically, if an investigation into the relationship between a surveillance practice (like loyalty cards) and related individuals/users is instigated then such programs would have limited scope for including individual perspectives, with focus given to analysing the structural impact of the technology itself or in quantifying individual attitudes on the technology (Nguyen et al. 2008). The relationship between individual and structural is extenuated, and becomes a binary of top-down and bottom-up, with only one perspective truly understood. Using the EEA it is possible to avoid this limitation, as it conceptualises both as similar EEAs that exist in a non-hierarchal relationship to each other, so that they can be understood by examining the relationships and mediations between them. This analysis explores the enunciatory aspects of the EEA, and what is shared and stated between them, in understanding how their relationship is mediated. For example, Roger's belief of surveillance is around a lack of concern, a belief that influences the relationship he has with this other EEA (as he continues to use his card with few worries) and also the discourse he crafts around his relationship to surveillance. These collective enunciations reflect his position and define him to this alternative assemblage, establishing the boundaries of an assemblage (i.e. a territory). But relationships are two-way, and if one were to explore the situated perspectives and beliefs of consumer surveillance and loyalty card operators (like supermarkets operators), and apply the same perspective that is applied to Roger, then another detailed EEA—with different rationales and relationships—would be found, allowing both perspectives to be compared. Numerous further lines of inquiry are present with this conceptual language, inquiries that treat both structures and individuals as equal. For example, what other assemblages are related to Roger's experience? What is their machinic composition? What enunciations are made by each assemblage to define itself? What other ethno-epistemes are present in other assemblages? What is not mentioned by Roger that the structural literature does discuss? The EEA makes individual and structural viewpoints intelligible to each other through the dual recognition of ethno-epistemic factors that exist for individuals and structures, and how these are a part of an assemblage of many different elements.

With the fundamentals of EEA thinking clear, additional data can be explored. As discussed above, assemblages are understood through their relationships, with other data—such as another participant's view—either contributing to the existing assemblage, or suggesting the creation of another. Consider the following statement made by Lesley, a female school teacher, in response to the same question posed to Roger:

> Lesley: It's probably in the back of your mind. That you've got Big Brother watching your stuff. But I don't lose sleep over it. I know what information I put up so I only put up what I want people to see and even on my Facebook account if you go in it, it's got no information, your birthday and stuff. I don't put up where I went to school or anything like that. I don't put any information like that up.

In the same way that Roger establishes a specific EEA with his beliefs, Lesley also does the same. She describes an ethno-episteme around control, and a lack of concern, but it does not reflect ignorance. Surveillance is not something to be worried about. Her worries are limited because of her perception of control, as long as she dictates what information is made available everything is fine. This ethno-episteme mediates the relationships she has to various personal and social situations, shaping the kinds of enunciations she is comfortable in making. She chooses not to share certain pieces of information, which in her view may be a source of surveillance risk. She also describes additional machinic aspects that are understood as important to her surveillance reality, and indicates the kinds of surveillance relationships that exist in her mind. For example, she refers to popular social media platform Facebook as a major contributor to her surveillance reality. She also refers to the cultural trope of Big Brother to conceptualise this, suggesting a possible state or government relationship to surveillance. These figures reframe how Lesley might consider her enunciations on surveillance, as she suggests that information like her birthday and educational history is important and needs to be controlled. Ultimately however these enunciations are still mediated by her ethno-episteme, and reflect an overall lack of concern.

Comparing this EEA to that described by Roger's, concepts of territorialisation may be used to determine the relationship between them. As discussed earlier, territories are temporarily organised bodies of flows within the assemblage. Their boundaries are not set, but are fluid, constantly moving and changing depending on the assemblage in question. While each participant brings a unique and situated perspective on surveillance into the analysis, with different machinic and enunciatory elements present, some commonalities are also raised. For example, both Lesley and Roger expressed an awareness and acceptance of surveillance, and both identify the internet as a source of surveillance. Because of the commonalities in the lines of flight of these two EEAs—in their similar enunciations, machinic elements, and ethno-epistemes—it would be illogical to consider them as drastically separate. Instead, they can be thought of as merging together, reterritorialising into a single assemblage. This association may be fleeting and temporary. As more data is acquired and other relationships and components are introduced, the nature of the relationships between the components of an assemblage may change, thus suggesting further lines of flight and the de/re-territorialisation of this single EEA into other separate EEAs.

Once these kinds of groupings are established, the dynamics between opposing territories/assemblages can be considered. Irwin and Michael's original use of the EEA for STS and PUS highlighted how issues like politics and governances were an important consideration between techno-science and society. Just as participants can be thought of as being in agreement and sharing commonalities that bring them together in a territory, there can also be oppositional views that conflict or break apart the EEA in a process of deterritorialisation. The concept of lines of flight returns here, as there are an infinite number of possibilities for the assemblage to move into. For example Kenneth, a retired meteorologist, when asked about his thoughts on surveillance, says:

> Kenneth: It's enormous. What do I think about that? In many ways I am truly disgusted by it because it is Big Brother, ain't it? The whole idea of "Us" and "Them", the communist state was so terrible because it spied on its people. Guess what? Welcome to the current West.

Like the other participants he is aware of surveillance, stating that "it's enormous". However, while his ethno-episteme has some similarities in terms of awareness, it is not congruent with that of Lesley or Roger. He understands the puncturing of his life by surveillance in terms of disgust, clearly voicing an active opposition to surveillance. The machinic aspects he describes are also diverse, with historical threads and narratives evoked to justify and make sense of what he considers a wholly negative situation. Firstly, he references a cultural narrative in "Big Brother", the spectre of constant surveillance by state authorities. Whereas Lesley also referenced Big Brother and the possibility of total surveillance, she dismisses it through exerting a sense of control through her actions. However, Kenneth voices a deep concern regarding surveillance, as he singles out surveillance practices as being comparable to Cold War rhetoric on communism, which for him has come full circle with mass surveillance in the West. Kenneth shows a great deal of awareness to surveillance, but his opinions put him at odds with the EEA that Roger and Lesley seem to form. Instead his EEA appears to take another line of flight, forming another EEA with its own distinctive enunciations, machinic elements, and mediating ethno-episteme. By recognising the processes of territorialisation, new analytical queries are opened up. What enunciations are made between these two territories? How are their boundaries enforced (or not)? What is the machinic composition of these and other EEAs? What is the relationship between them, and how do ethno-episteme mediate these? How did the deterritorialisation happen? It is not necessary to answer any of these questions specifically, they are merely suggestions of possible directions an analysis may take, and demonstrates how the emergence of great differences in the viewpoints of individuals and structures does not represent a problem for using EEAs, merely the next direction for analysis.

Conclusion

Using EEAs provides a means of analysing surveillance that avoids the binary between individuals and structures, allowing both perspectives to be integrated. With surveillance becoming further and further entwined into the everyday lives of citizens it is no longer sufficient to accept assumptions about the individual and their relationship with surveillance. Individuals are invariably the focus of surveillance systems, and despite a large volume of research that seeks to understand the system, the actual subjects of the system are less well described. This article has sought to provide an introduction to how EEAs might be used to address this. Through considering surveillance as being an EEA, a temporally bounded space of heterogeneous association, that is shaped by the situated knowledges and beliefs of the individual(s) or group(s) in question, individual and structural views can both be considered. This is achieved through considering individuals and structures in similar terms, through exploring the heterogeneous factors raised (an assemblage), and how the relationships and connections of this assemblage are mediated by the situated knowledge and context (the ethno-epistemes). By considering the composition of these assemblages (the machinic), what is exchanged between them (the enunciatory), and accepting their constantly fluidity and movement (lines of flight), the tools for understanding the dynamics of the assemblage and its (de)territorialisation are provided. The EEA therefore helps provide an analytical frame to account for both individual and structural aspects in the analysis of surveillance.

However, considerable further work needs to be done to explore the feasibility of this approach in broader scale surveillance projects. Is the EEA up to the task in larger scale contexts? Is it able to provide analytical insights that are genuinely helpful and progressive? These and other questions on this approach are yet to be answered. Science, technology and society studies has used the EEA to great effect, and as discussed above, the origins and trajectory of the EEA have similarities to the debate in Surveillance Studies. But whether EEAs can be as helpful to Surveillance Studies as they have been to STS/PUS is an

open question. However, at the very least using the EEA provides an indication of how individual and structural viewpoints on surveillance can be explored together. By using a conceptual language that grasps the heterogeneous and mediate nature of contemporary surveillance, it is possible to integrate subjects and structures.

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