Globalizing Surveillance

Comparative and Sociological Perspectives

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abstract: If surveillance was once thought of as primarily the domain of the nation-state, or of organizations such as firms within the nation-state, in the 21st century it must be considered in a broader context. Surveillance has to do with the rationalized control of information within modern organizations, and involves in particular processing personal data for the purposes of influence, management, or control. It also depends for its success on the involvement of its 'data-subjects'. In countries of the global north, surveillance expanded with increasing rapidity after computerization from the 1970s onwards, a process that also enabled it to spread more readily to other areas, especially from workers and citizens to consumers and travellers. Since the 1980s, surveillance has become increasingly globalized, as populations become more mobile, and as social relations and transactions have stretched more elastically over time and space. Globalizing surveillance was also catalyzed by the events of 11 September 2001. However, surveillance processes occur differently in different cultural contexts, as do responses to them. Understanding comparatively the various modes of surveillance, understood sociologically, helps us grasp one of the key features of today's world and also to see political and policy responses to it in perspective.

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Modernity, Surveillance and Risk

Surveillance comes to light, as it were, when people realize that they are being 'watched'. The 'watching' may be almost literal, as in the case of closed circuit television surveillance (CCTV) or much more metaphorical

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(though no less real) in the case of airport check-ins, supermarket check-outs, Internet cookies, driver's licence production for police, employee cards in the workplace and so on. Surveillance has also become much more visible following the dramatic and disastrous events of 11 September 2001 (hereafter, 9/11). High-tech companies are wooing willing governments with their security and surveillance products, designed to detect 'terrorists' and also other miscreants who may be found in cities or in airports and at borders. In this case, particularly in the USA, much public opinion seems to be tipped in support of surveillance (Lyon, 2003b).

Already, from the reference to 9/11, one may sense the ways that surveillance practices are spreading around the world. If local moral panics produce public interest in video surveillance in streets deemed to be dangerous at night, or on a national level, attacks such as the sarin gas assault on the Tokyo subway in 1995 lead to surveillance crack-downs, then global panic regimes such as that generated by the attacks on the World Trade Center and the Pentagon will have similar effects (Lyon, 2001a). The time-honoured technological fix is invoked once more to combat guerrilla activities (often called 'terrorism') wherever they may appear. This is not for a moment to deny the understandable desire for safe streets, or to underplay the risks of terrorism in the 21st century. It is simply to acknowledge that where older moral markers have vanished, where nation-states experience a reduction of their role to maintaining law and order, where capitalist restructuring is occurring and where technique has a culturally privileged position (Ellul, 1964), technological solutions will readily be sought. It does not follow, however, that 'technology' is privileged in this account.

Surveillance is not new, or a new technological phenomenon, or a response to external threats, or even a product simply of modernity. In its ancient forms, it was relatively simple, having to do with taxation records or the census, or perhaps with the apprehension of criminals or spies. The 'information state' could be said to have appeared in England, for example, from 1500. Edward Higgs (2001) argues that English central state surveillance arose first as a means of shoring up state power itself, over against other states, and not primarily as a means of social control. The census and civil registration helped to create sets of circumscribed rights but at the same time, it has to be said, provided the means for social control, if circumstances seemed to require or invite it.

This paradox of surveillance is noted by Nicholas Abercrombie et al. (1983), in which the means of granting civil rights was at the same time a potential means for states to gain informational power over citizens. This means, importantly, that at least in this case – and, I would argue, in almost all cases – surveillance is an ambiguous process (Lyon, 1994). Even in a globalizing context, I argue, surveillance retains this paradoxical,

ambiguous character. Even though alliances of nation-states now boast tremendous surveillance power, using satellite tracking stations and super-computer message filtering devices, and although corporations also have access to international flows of personal data, this does not translate automatically into crude control.

In its modern forms surveillance is both entwined with capitalist production and consumption as well as state-oriented bureaucracies and international military affairs, and has become highly sophisticated. But surveillance is also routine, an aspect of daily life that increasingly involves everyone. In addition, surveillance has become increasingly bound up with the mediation of risk. For Ulrich Beck, what he calls the risk society appears as an outcome of industrial society when the 'social, political, ecological, and individual risks created by the momentum of innovation increasingly elude the control and protective institutions of industrial society' (Beck, 1996: 27). Beck now argues that 'world risk society' has emerged (Beck, 1999) in which uninsurable risks – including 'terrorism' – have become prominent. In the present case, we could argue that the pace of surveillance growth, enabled by commercial pressure, technological innovation and cultural commitments to 'techniques-as-solutions', far outstrips the capacity of analysis and policy to understand and cope with it. Such surveillance both addresses risks and produces others.

Pre-industrial society had incalculable hazards, in the shape of famine, storms, plagues and wars, but in modernity these became calculable, insurable risks, in which the growing state – and eventually the 'welfare state' – played a large part. But whereas Durkheim, Weber and Simmel saw people being 'released' from corporate transcendental securities into industrial society, now individuals are being 'released' from industrial society into Beck's 'world risk society' (Beck, 1996: 29). Risks, in short, are being individualized, and the old provident state is less and less willing to bear their cost. In order to calculate risks, insurance companies need information, and they need standards of judgement by which to determine insurability (Ericson and Doyle, 2003). That information, as it pertains to individuals, is part of what we know as surveillance today.

But at the same time, risks may be reproduced, in a cycle of risk production. The development of risk technologies, and of their associated surveillance systems, may itself be viewed as risky by those who are its data subjects. Thus a further paradox appears, that in order to cope with the rising tide of risks, practices emerge – processing personal data with inadequate safeguards – that are themselves deemed by many to be risky. This has become increasingly clear since 9/11, as civil liberties groups and privacy lobbies have raised a chorus of complaints about personal data abuses and intrusions resulting from new security laws

and 'anti-terrorist' measures. Public opinion in the USA may accept in a general sense the surveillance demands of increased security, but opposition groups are becoming increasingly vocal, such that certain measures (air passenger checks, for example; Wald, 2003) are being mitigated.

Late Modernity, Surveillance and Globalization

Surveillance experienced some important changes during the last part of the 20th century. It began to morph from its erstwhile character as a centralized and hierarchical 'apparatus' of the state or of capitalistic corporations and started to take on a different character as a decentralized and rhizomic 'assemblage' (Haggerty and Ericson, 2000). Fragments of data are extracted from bodies (biometrics does this literally; other forms of surveillance rely on behavioural traces) by a variety of agencies to be processed and often profiled to create data images or 'virtual selves'. These are used as the basis of discrimination between one category and another, and to facilitate differential treatment. While some forms of surveillance retain their face-to-face frame, others have become increasingly dependent on software codes and algorithmic methods (Graham and Marvin, 2001). And as a concomitant of these, surveillance is also being globalized in unprecedented ways. Before examining this more closely, it is worth noting some definitional matters.

Surveillance is here thought of as a product of modernity. That said, it may also display 'postmodern' features. While it is important not to give the impression that somehow modernity has been superseded or left behind, it is of little consequence whether one refers to 'late' or 'post' modernity in this context. The former term is preferred by Anthony Giddens (1990), and many have followed his lead, no doubt because it helps to distinguish sociological analysis from the more cultural studies of postmodern*ism* (Lyon, 1999). The latter term, proposed as a sociological category by Zygmunt Bauman (1992), suggests that in several important ways new social formations appear to be in the making, which may be thought of as having integrity in their own right, and not merely as geriatric stages of some previous form. However these changes are designated, it is important to note that modernity has been undergoing some very significant alterations over the past 30 years. Surveillance is implicated in these changes.

'Late modernity' is used here to refer to the general political, economic and cultural transformations that occurred in the last third of the 20th century. For the purposes of understanding surveillance better, my use of 'late modernity' refers especially to the shift to a *consumer* capitalist phase (this is actually what Bauman emphasizes in his treatment of *post*modernity!), alongside a decided *post-welfarist* tilt in social policy and

crime control (Garland, 2001). The kinds of information control involved in consumer data management produce the detailed profiling and data mining on customers that make up commercial surveillance today, while that involved in crime control and security measures contributes to the algorithmic surveillance and actuarial justice that has become equally prevalent. Other sorts of surveillance, notably in government administration and the workplace, continue to be highly significant, but in late modernity they are supplemented, and sometimes interfaced or integrated, with the newer kinds. In all cases, 'social sorting' has become more significant (Lyon, 2002, 2003c).

Another feature or cognate aspect of late modernity is globalization. Again, this term is fraught with controversy. Globalization is characterized by action at a distance, such that social relations and transactions are stretched across time–space (Giddens, 1990); the speed, intensity, reach and impact of communications increase globally; networks and nodes become structurally more important (Castells, 1996) depending on information and generating risks; and the global is mediated by the local, such that it makes sense to talk of 'glocalization' (Robertson, 1992, 1995). Globalization has economic, social, cultural and political dimensions, each of which has ramifications for surveillance. These have to do with the political-economic restructuring that began in earnest in the 1970s.

The globalization of surveillance is directly connected with doing things at a distance. We no longer see, let alone know, many with whom we make exchanges or interact. They are geographically apart from us. As social relations are stretched, courtesy of the new communication technologies, so more and more interactions and transactions become abstract and disembodied, which jeopardizes the sorts of trust that once depended upon the face-to-face and the co-present. Some kinds of trust may be re-established, however, by the use of tokens – such as ID cards, PIN sequences, photo cards, telephone numbers and drivers' licences – all of which now involve searchable databases (see Lessig, 1999). Electronic commerce or air travel are obvious examples of how such systems transcend national boundaries in new nodes and networks, yet different surveillance regimes associated with these have different characteristics in different countries.

In the later 20th century, surveillance underwent certain changes that relate to new technologies. Computers were used to compile personal databases, which became increasingly searchable. As new telecommunications and eventually the Internet and other networks became available, so personal databases became remotely searchable. This is the infrastructural basis of contemporary surveillance, and it also makes it, in principle at least, an international phenomenon. Today's machine-readable passports are a good example of an older administrative scheme that has been

upgraded using new technologies (Torpey, 2001; Salter, 2003). Airline passenger data are another example, and in this case, commercial transactions are involved in security surveillance. It is also a case that, like passports, requires some international harmonization. To an extent, what happens in one country has to be matched in others.

As noted already, although technological developments facilitate globalized surveillance, it is a big mistake to imagine that the changes taking place have to do merely with new technologies. Communication and information technologies may *enable* aspects of globalization and global surveillance to occur, but they certainly do not *cause* them to do so. Those new technologies are themselves the product of a quest for ever-increasing mobility and speed dating back before the Second World War, but which was galvanized decisively in the economic and technological boom that followed the war. On the one hand, in the commercial sphere, consumer data were increasingly valued and sought as a means of creating customers for products in the lean, just-in-time approach of the so-called new economy. And on the other hand, in the realm of crime control, *potential* suspect data were sought as a means of anticipating and pre-empting illegal activities, many of which were created by the opportunities appearing in dispersed, mobile, affluent societies.

In the 21st century, it is no accident that some of the key surveillance measures are ones that either relate back to earlier quests for geopolitical power, or to the new contexts created by economic restructuring in the 1980s and 1990s. As to the first, security regimes which since the Second World War have become international alliances now boast complex satellite tracking systems such as 'Echelon'. This spans several continents, although it is the outcome of a so-called UK–USA agreement, and filters messages from many different media – email, telephone, fax and telex – through a device known as a 'dictionary'. Although military concerns prompted this system in the first place, it is also now used for industrial and commercial intelligence as well.

The latter kinds of surveillance, relating to economic restructuring, also require the processing of large amounts of personal data, but this time in the context of either the control of the drug trade, or in electronic commerce transactions. International trade in illicit drugs has spurred extensive policing and surveillance measures in the past 20–30 years. As for electronic commerce, its practices are both for verifying identities but also for profiling consumers, such that their details too can be filtered, sorting them into various categories of consumption. Policing across borders involves cross-border data flow, as does e-commerce across borders.

So far I have commented on the ways that surveillance is similarly enabled by new technologies, wherever it is found, and on some of the social pressures leading to the development of those systems in an

international context. But just as technology does not determine outcomes in a single national context, so does it not do so in a global one either. Globalization is often thought of in primarily economic terms, and this dimension of globalization is certainly significant for surveillance. The flexible labour regimes required for contemporary capitalism entail the extensive use of mobile workers, whose activities are tracked across distance and borders. And more and more commercial activity also occurs in direct ways, courtesy of computer networks, such that personal data flow across national divides as well (Bennett and Raab, 2003).

At the same time, globalization also relates to other entities and processes, notably the activities of the nation-state. Personal data have been flowing over national borders for many years in relation to personal travel, in the systems of customs, immigration and citizenship. The passport is a vital document in this regard (Torpey, 2001). Such data also travel courtesy of policing and intelligence services, and this has only intensified since the attacks of 9/11 (Ball and Webster, 2003). Indeed, as guerrilla warfare has grown as a global phenomenon since the last decades of the 20th century so, paradoxically, high technology surveillance methods have been reinforced (Downey and Murdock, 2003). This in turn is not unconnected with the progressive militarization of policing (Haggerty and Ericson, 2001), and of urban life (Graham and Marvin, 2001), again, as globalized phenomena.

Not only are different social sectors drivers of particular kinds of surveillance, but it is also the case that receptivity to surveillance differs depending on cultural and national contexts. New methods may be acceptable in one context and not another. Thus, for instance, national electronic ID card systems may be found already in use in Thailand, Malaysia and Singapore, but they have been rejected in Korea, and are only at a preliminary planning stage in Canada, the UK and the USA. In another example, the electronic monitoring of offenders, which began in the USA, was slow to find such acceptance in Europe. As Gary T. Marx points out in his comparative study of undercover police methods, it is 'premature to conclude that a standard, technocratic, anticipatory, velvet glove, paradigmatic American social control model is taking over the western democratic world' (Marx and Fijnaut, 1995: 324).

It is true that some structural similarities and the common problems facing (late) modern states may produce similar techniques in different places. Airport security systems are an obvious case in point. Equally, the same transnational corporations are trying to sell their equipment across the world, so, again, the chances are strong of similar solutions appearing in quite distant places (see Zureik, 2003). Sun Microsystems, for instance, a US-based company, provides the equipment, software and support for the national electronic ID system of Thailand. Some countries

will also want to demonstrate their technical prowess using their surveillance systems – it is arguable that both Spain and Malaysia have developed their new smart ID cards at least in part for this reason (Stalder and Lyon, 2002).

It is also true that local and regional social, political and cultural contexts will experience surveillance in different ways. Some devices with high-level locational surveillance capacities, such as cellphones, are more suited to densely populated areas and thus will increase tracking in cities, but not necessarily in rural areas. Over time, the use of radio-frequency identification devices (RDIFs) and satellite tracking may change this, too. But technological capacities never operate alone. In North America, while commercial interests and government agencies such as the Department of Homeland Security give those technologies their chance, they are also opposed by civil liberties and consumer groups. In South-East Asia, on the other hand, where more authoritarian and less democratic governments are able to mount systems with little public consultation or approval, it is possible to establish large-scale surveillance systems against a backdrop of much more muted dissent.

One of the most striking developments since the 1990s has been that Britain emerged as the clear world leader in CCTV deployment. That country has a far more comprehensive system of urban, public space cameras than any other in the world. This may be explained by the presence of dramatic events (the murder of a small boy whose assailants were caught in the lens of a construction site camera) or long-term problems (such as IRA terrorism) (Norris and Armstrong, 1999). But if one considers the electronic tagging of offenders, it is clear that the USA (where the technique originated) is far more likely to deploy this method than its European counterparts (although there is evidence that this is now changing; Nellis 2000). The mere existence of new technologies is far from a sufficient reason for them to be used.

Wherever they exist, however, and for whatever reasons they have been established, surveillance systems do tend to depend increasingly on searchable databases. This means that they are used for 'social sorting', for the classification of populations as a precursor to differential treatment (Lyon, 2002). In the realm of crime control they display the character of 'categorical suspicion' (Marx, 1988), whereas in the commercial realm they involve 'categorical seduction' (Lyon, 2001b). In the latter case, consumers are sorted and sifted for their relative worth to marketing companies in a form of discrimination that creams some off for special treatment and cuts others off from consuming opportunities altogether (Gandy, 1995).

Social sorting is also a crucially important activity of nation-states, often achieved by means of the census, and of border controls, but also in welfare administration. Comparative studies are very valuable at this

level, too. How ID classifications work at borders in Israel is not dissimilar from the ways in which they operated in South Africa under apartheid (Zureik, 2001). Similarly, the categories operated by welfare professionals serve to produce populations for certain purposes, a practice that would bear comparisons across different national jurisdictions (Gilliom, 2001). Beyond this, one could examine fruitfully the ways in which Internet surveillance sorts populations by income, gender and 'race', how CCTV does something similar with less high-tech methods (Norris, 2002), and how this, too, differs from place to place.

Two things have to be recalled about these social sorting processes, particularly in comparative perspective. One is that the systems themselves are not technically foolproof; they may not function in the ways intended (and of course, they may also have unintended consequences). The other is that the success of surveillance systems always depends upon the collusion (however weak or even unconscious) of their subjects. Some will comply willingly, others will negotiate, and yet others may actively resist. This also means that the same technological systems may be used on occasion for quite varying and even contradictory purposes.

This latter point returns us to a consideration of the inherent ambiguity of surveillance processes. The same technologies may be used for highly repressive surveillance purposes and simultaneously for the purposes of counter-surveillance or resistance. Some interesting comparative work could be done in this area. In China, for instance, western corporations have been sought for advice and equipment to bolster the surveillance capacities of a very undemocratic state (Greg, 2001). At the same time, the Internet and email are used in China as a means of operating beyond the reach of the state, by democratic dissidents, Falun Gong members and so on. In Singapore, too, several 'sites of resistance' may be found on the Internet, despite stringent efforts to circumscribe it (Ho et al., 2001).

One of the most striking events for the globalization of surveillance is the aftermath of the attacks of 9/11. This may be seen in two related surveillance areas. One is the ways in which several governments in different countries have proposed new measures for dealing with the 'terrorist' threat (Ball and Webster, 2003). These include 'smart' ID card systems to try to determine who is and is not a legitimate resident or visitor in a given country, CCTV systems with facial recognition capacities in airports and elsewhere, to check against database images of known terrorists, and various other biometric devices to verify identities more satisfactorily (Lyon, 2003d). A considerable amount of research is called for to determine which country adopts which technologies and why. How far does the experience of one country encourage or discourage another?

The other surveillance consequence of 9/11 is the proliferation of anti-terrorist legislation in several countries. These tend to relax the limitations on previously stricter laws, such as those to do with wiretapping or indeed any message interception. Few modern western countries have not altered their laws in some respect, or passed new ones, and in East and South-East Asia, new measures have also been adopted. Already existing systems of cross-border policing have been considerably expanded, with long-term consequences for globalized surveillance (Bigo, 2002). Again, comparative investigation to determine the extent of mutual influence between countries will make a vital contribution to social and political understanding.

Globalized Surveillance and its Consequences

I have argued that both for ordinary and extraordinary reasons, surveillance is an increasingly globalized phenomenon. The ordinary reasons are that, just as growing surveillance may be explained in terms of the overall structural developments of the western world since the Second World War (and not as sinister attempts at social control), so now, as modernity globalizes, surveillance globalizes along with it. Electronic commerce, increased geographical mobility, the 'war against drugs' and other such processes bring enhanced personal and population surveillance along with them. The extraordinary reasons relate to the events and consequences of 9/11, that are catalyzing surveillance developments in several countries simultaneously, and, importantly, are permitting further convergence of different kinds (state, commercial) of surveillance. Several consequences may be traced from this.

First, whether for the purposes of commerce or policing, networked surveillance blurs the old borders (and the old boundaries) of surveillance. Standards are developed between countries for electronic transactions and identity verification, for example, but also for the detection and apprehension of offenders or suspects. The use of searchable databases and of remote checking makes possible surveillance across borders, as for instance in the case of airline ticketing and security measures. Unfamiliar methods of checking may appear in airports, and some of them – for example biometric checks in Keflavik Airport, Iceland – may appear unusually stringent given the size or remoteness of the country.

Second, certain surveillance trends may be accelerated in a global context in response to 9/11. Policing offers some good examples. Two trends have emerged in greater strength in recent years – the privatization and the militarization of police. More and more private police forces, often referred to as 'security' agencies or similar, complement public policing in the 21st century. But they also seek, and use, the same kinds of personal data as their public counterparts (Ericson and Haggerty, 1997),

and they do so according to similar standards (of insurance risk assessment). The other trend is the militarization of the police, which is in one respect a domestication of armed forces once used primarily against external aggressors. Both these trends fit well with the shifts taking place since 9/11, however, in that private police and more military methods are appropriate for the settings in which the new surveillance is required – borders, airports, central urban areas and so on.

Third, in the area of policy, new initiatives are appearing (and others are demanded) in relation to the globalization of surveillance, especially in the commercial realm. As Colin Bennett and Rebecca Grant say, globalization means that personal 'data on individual customers, employees, suppliers, investors, competitors, and so on' are transferred instantaneously around the world, and this traffic 'has the potential to undermine national efforts to protect the privacy of citizens' (Bennett and Grant, 1999: 12). The European Directive on Data Protection has already had extensive influence in Canada and the USA, and this kind of country-to-country or region-to-region transfer of experience on policies and standards is likely to increase. How it occurs, though, is an empirical question, that bears further examination.

Fourth, one can hardly look at the globalization of surveillance, especially within a framework that acknowledges the active role of 'data subjects', without looking at the globalization of resistance. Resistance to surveillance, whether by consumer groups, computer professionals, or civil rights activists (especially after 9/11), is increasingly known about in different countries. Webcams may be used effectively in this regard, for example. The New York Players, who offer dramatic presentations in front of urban video cameras, are known about in other parts of the world. The websites of groups such as Privacy International or the Electronic Privacy Information Center may also be used in a networking fashion for groups that question the existence or extent of surveillance to network with each other. Interestingly, a new body, the Asia-Pacific Privacy Charter Council (www.BakerCyberLawCentre.org/appcc) came into existence in 2003, with the potential to draw many countries beyond Europe and North America into debates over surveillance and privacy.

Fifth, academically, and in relation to policy studies, interest in surveillance and privacy has increased considerably since the 1980s. A number of now classic studies appeared from the mid-1970s (Rule, 1974; Giddens, 1985; Marx, 1988; Flaherty, 1989; Dandeker, 1990; Bennett, 1992; Regan, 1995; inter alia). During the 1990s, a number of more general treatments appeared (e.g. Whitaker, 1999; Staples, 1998), along with further studies of data protection and privacy policy (e.g. Bennett and Grant, 1999; Agre and Rotenberg, 1997) as well as further more theoretically informed studies (e.g. Bogard, 1996; Norris and Armstrong, 1999).

This accounts for the emergence of 'surveillance studies' as a cross-disciplinary field for research. The disciplines represented include geography, history, information and computing sciences, political science, sociology and policy studies. Although this convergence is mainly evident in Europe and North America, interest is also growing in Pacific Asia and elsewhere (Lyon, 2003a). Comparative studies are becoming increasingly important (such as the European Community initiative on closed circuit television in cities, called the 'Urban Eye' project). A new online journal, *Surveillance-and-Society* (www.surveillance-and-society.org), is helping to crystallize some of these strands of interest.

At present, however, there is arguably a lot more interest in the globalization of legislation relating to surveillance (privacy, data protection) than in the globalization of surveillance itself. This represents a major challenge for sociologists and other social scientists, not least because a crucial first step in considering legal changes is to understand analytically the conditions that gave rise to them in the first place. Three items in particular require careful research.

One task is to discover exactly what happens to personal data when they are extracted from or submitted by individuals. All too often, the existence of a personal database (technology) or a data-processing agency (institution) is taken to be evidence of personal data flows of particular kinds, and with predictable effects. But as we have observed, mere software and hardware, or mere institutional resources do not on their own produce specific kinds of surveillance. They may, however, induce certain kinds of determinisms in researchers. Mapping the trajectories of personal data will take place in largely untouched terrain.

A second task is to find out exactly how people respond to and interact with systems that automate their transactions and handle their data. Again, surprisingly little is known in many cases (with some notable exceptions, e.g. Norris and Armstrong, 1999). Yet so-called data-subjects – agents, embodied persons – actually engage extensive repertoires of response, depending on timing, social context, location and so on (Ball, 2002). This may be simple, unthought compliance, through to skilful negotiation and active resistance. Knowing what occurs, in which contexts, and why, will be an immensely constructive task for surveillance studies.

A third task is to explore the consequences of surveillance – especially in its rapidly globalizing varieties – for governance (Rose, 1999). Understanding surveillance in the 21st century also entails an analytic move beyond the conventional loci of power – the state or the corporation – to discover ways in which all sorts of processes, procedures, strategies and tactics help to shape relations and enable or constrain activities touched by globalized flows of personal data, from international to local community

levels. Emergent power relationships, relating to surveillance, and within self-organizing networks, cry out for serious and subtle analysis.

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