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Workplace Surveillance

by Alex Rosenblat, Tamara Kneese, and danah boyd

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History and Perspective

In order to increase efficiency, measure productivity, decrease risk, and generally maximize profits, many private enterprises monitor their employees. While “workplace surveillance,” a term used interchangeably with “employee monitoring” (Ball, 2010, p. 88) is an age-old practice, its contemporary methods in the United States have their roots in the transformation of the workforce in the mid-19th to early 21st centuries. When laborers began moving to cities to sell their time for wages, the focus of work and the workplace shifted from subsistence labor on farms to hourly and salaried work in the factories of the industrial revolution. Business in the United States turned into “big business,” at the end of the 19th century, as the railroads expanded their organizational reach, merchants with localized shops and market knowledge had to merge in order to remain competitive in a growing market. The mergers did not produce uniform organizational units automatically, and the modes of production and accounting within the combined company were often in disarray (Saval, 2014, p. 38). Once the production of goods and the methods of their transit exceeded the slower, human pace of labor, a control crisis emerged for employers who suddenly needed to process much more information to keep up with the industrial pace of production (Beniger, 1989, p. 169). The pressing question became: what structures and technologies can ensure efficiency and integrity in the organization of business and labor (Zureik, 2003, p. 48)? The innovations in information processing and communication technologies that developed to address this question were mainly directed at managing workers (Beniger, 1989, p. 169).

Although the philosopher Adam Smith had theorized about this subject in England in the 18th century, the actionable answer to this question in the United States came from Frederick Winslow Taylor, a measurement-obsessed mechanical engineer who worked as an efficiency consultant to businesses at the turn of the 20th century (Saval, 2014, p. 45). His mission, emerging alongside Fordism, was to map out the knowledge of how a task was done by identifying, fragmenting and regimenting workflows and to deploy methods of “performance monitoring” to reach production targets (Sewell, 2005, p. 691). The worker’s knowledge of and control over the work is thus removed from the worker and its execution is rationalized into discrete piecework that is organized and overseen by the manager in an increasingly scientific process (Braverman, 1998, p. 80-82).

The rule of the Taylorist system is that the unobserved worker is an inefficient one (Saval, 2014, p. 42). Monitoring is meant to prevent workers from slowing or sabotaging the modes of production, both in factories and in offices. In Taylor's day, some managers tried to achieve willing compliance by making time-tracking into a game, using a stopwatch to foster friendly competition amongst workers (Saval, 2014, p. 42); contemporary managers continue to use a variety of methods, like reward systems, to encourage their employees to comply with workplace monitoring.

Offices, which were expanding from the typically close-knit spaces that bosses shared intimately with their aspiring and upwardly-mobile clerks, welcomed the Modern Efficiency Desk in 1915. The Desk was invented as a counter-point to the Wooton, which was "a grandiose desk with numerous cubbyholes for papers, and foldout wings, and truly a home for the clerk and his papers." By contrast, the flat, metal Efficiency Desks installed in long rows "gave clerks and their papers nowhere to hide" (Saval, 2014, p. 42). Author Nikil Saval (2014) describes how, as merchants' offices grew into corporate structures, white-collar office work devolved into positions perceived as less prestigious in American society. He notes that in 1920, there were 3 million clerical workers in America, compared to 80,000 in 1870 (p. 74), and the specialties amongst them had grown exponentially. The trend became for bosses to separate from the spaces they had previously shared with their clerks in favor of occupying segregated offices, and departments were invented as organizational units to house clerks according to their discrete functions. Eventually, the departments would be sub-divided into cubicle workspaces (p. 60). Employee monitoring and management grew with the changing technologies and workspace designs that increasingly removed autonomy, discretion, and prestige from workers and allotted it to a managing elite.

Modern day managerial supervision has become palpably easier as new technologies have enabled more varied, pervasive and widespread monitoring practices that include routine drug-testing and the monitoring of email (Sewell, 2005, p. 700). Moreover, the boundaries of what constitutes a *workplace* are becoming increasingly porous, especially as digital devices and technologies mediate much of our work content and communications both remotely and on a job site. Electronic monitoring can occur directly at work or as a function of employees' accessibility to employers through their devices beyond the office. Subsequently, the boundaries of workplace surveillance are being negotiated in the context of a larger debate between what is public and what is private (Dash, 2014).

For many sociologists, the power dynamics of social control, particularly in the organization of workplace surveillance, harken back to Michel Foucault's interpretation of an idea that Jeremy Bentham had for the strategic, spatial placement of 19th century prison guards. In Bentham's model, guards were positioned in a way that minimized who could see them, but maximized their view of the prisoners, in a panoptic design that aimed to govern prisoners' behavior by the coercive uncertainty of being seen (Lyon, 2008, p. 57). Although Bentham's design was seldom implemented in prison

architectures, the panoptic principle is frequently applied to interpretations of technologies that have surveillance capacities. Zuboff (1988) describes, for instance, how the 'heightened visibility' provided by surveillance cameras in a retail shop that signal a mechanism of control can, to the business manager, capture 'objective facts' to discover where an operational deficiency is (p. 86). The cameras can also act as safeguards against shoplifting, track customer movements for analytics purposes, monitor employee behavior, and identify an area in the store that needs to be tidied up (Harris, 2014). The rhetoric of safety often plays into the reasons listed for surveillance technologies, although safekeeping is seldom their sole purpose or effect.

Just as the watchers experience surveillance with a variety of intentions, understandings, and purposes, those who are subjected to monitoring express a range of reactions to surveillance, including passive compliance and active resistance. While many psychologists and organizational behavioral consultants see monitoring technologies as neutral, their measurements signal recognition that while these tools are used to achieve organizational goals, they can also negatively impact employees (Ball, 2010, p. 88).

Power and Purpose

The application of new surveillance technologies in the workplace affects power relations with different outcomes (Zureik, 2003), and the effects of surveillance in general are not homogenous (Yar, 2003). Similarly, workplace surveillance technologies can act to 'anticipate conformity' or to normalize discipline, but not everyone sees a panoptic machine when they pass by a closed-circuit television (CCTV) camera (Yar, 2003). Monitoring is often accepted or perceived as one method by which employers communicate to employees which tasks they value protocol for, and where employees are ill advised to be creative (Ball, 2010, p. 93). However, the effects of surveillance may not fit with the goals an institution has set out to achieve via their monitoring methods (Lyon, 2008, p. 86). For example, British police installed CCTV cameras into the area where the "Yorkshire Ripper" murders of prostitutes occurred in the 1970s and '80s, hoping to scare prostitutes from their place of work (Sewell, 2014). Instead, prostitutes gathered in front of the cameras so that their departures from the street and into a vehicle would be time-stamped, and the license number or other details of the driver would be recorded in case anything bad happened to them.

Surveillance technologies can be used in many ways to create a sense of security for workers, and the public. "Sousveillance" is the term that describes how those who are typically watched by a more dominant power from above can turn the surveillance gaze on their overseer from below. For example, some workers have used their smartphones to record abusive behavior by their employers in performance evaluations (Koeppel, 2011). Video-recording technologies became fixtures of public life starting in the late 1960s, when CCTV cameras were installed in public places as a tool for law enforcement. Widespread adoption of video surveillance tools in businesses like banks and

restaurants rose in the late 1990s, when these tools became cheaper and as data storage technologies improved (Roberts, 2012).

Not only do law enforcement agents turn to surveillance cameras to investigate criminal activity as a record of evidence; the public increasingly demands access to surveillance tapes to question the actions of police. After Michael Brown was killed by a police officer in Ferguson, Missouri in 2014, public outcries demanded access to both public and private surveillance records. Some police departments around the country are adopting body-cameras for its agents to have a record of events. The existence of surveillance footage collected by law enforcement agents who are wearing body-cameras is not always readily available to the public, though. For example, the San Diego Police Department asserts that any footage captured by the cameras their agents wear on-duty is not part of the public record once that footage becomes part of an investigation; they will routinely refuse requests to release recorded data (Libby, 2014).

It is not always clear who owns recorded data, and ownership issues can affect the power dynamics of work-related surveillance in ways that cut across all socio-economic classes. For example, a woman wearing Google Glass, which has recording capacities, was attacked in a bar in San Francisco (SF) recently by patrons who objected to perceived invasions to their privacy, and because the expensive Glass device symbolizes tech workers who form a privileged elite in a city rife with tensions between high-income tech workers and low-paid service workers (Resnikoff, 2014). However, low-paid retail workers could start wearing Glass, too. Emotient, a facial recognition company, was testing out an app earlier in early 2014 for Glass that could help retail workers gauge how successful their promotional campaigns are with customers by analyzing signals like their facial expressions (Truong, 2014). The data gathered by a Glass app may be generally owned by third-parties, rather than the owner of a Glass device, who mine the information it collects to a variety of purposes (Resnikoff, 2014). Even when surveillance technologies are more evenly distributed across socio-economic classes, their effects do not necessarily reflect evenly distributed gains from the technology. In fact, if lower-income workers are broadly equipped with devices that can be used for surveillance, they may serve to normalize the public's exposure to technologies that people might be more weary of if they reflected the power of a privileged class. And yet, the divide between who has a device, as opposed to who has the data, reflects an important and widening disparity in the ownership of information that can impact issues of control in the workplace.

Employers have a strong incentive to maintain control and order of their workplaces, and surveillance is often used to achieve this goal. CCTV cameras are usually visible in the workplace (although Nanny cams are a prominent exception), as a signal to workers (and sometimes customers) that they are being watched so that they behave accordingly. Much like cameras were intended to communicate surveillance to Yorkshire's prostitutes by recording the details of their location and activities, cameras are a warning that a record of bad behavior is available to the cameras' operators.

Time and activity tracking technologies today often function to root out the inefficiency now known as “time theft,” which employees are especially warned against as part of their job training in food service, warehouse, retail, and cleaning industries (Ehrenreich, 2001, p. 29). “Time theft” can be punishable by law; for example, fudged time sheets can lead to felony charges like grand larceny and falsifying business records, even for temporary clerical workers (Staffing Industry Analysts, 2014). Employees have also used the principles and legal thrust of time theft to seek legal remedies from their bosses when they have been made victims of “wage theft.” Examples of this are when employees are made to work after they clock out, or in instances when their supervisors shave time from their time cards, resulting in stolen wages. Wal-Mart has been held liable for millions in wage theft (Staffing Industry Analysts, 2014), and McDonald’s workers recently filed seven class-action suits in New York, California, and Michigan for similar wage theft violations (Fox, 2014). In those cases, the monitoring of time and tasks serve to empower the workers to hold their employers accountable for misconduct, but they also speak to how embedded the notions of workplace surveillance and trackability are in how labor and employment relations are negotiated on a legal scale, as well as at a managerial level.

In this digital era, businesses use electronic monitoring primarily to root out productivity losses that stem from Internet misuse, to protect trade secrets from being communicated, and to prevent legal liability for their employees’ activities (Smith, n.d.). Furthermore, because of the ease of doing so, digital surveillance is seen as an acceptable practice for disciplinary and general, pro-efficiency purposes. The service sector is the most exacting in terms of minute-level surveillance, but the Internet is credited with amplifying monitoring across the board. According to scholar Kirstie Ball (2010), 75% of US companies monitor employee communications and their activities on the job. Although the Electronic Communications Privacy Act of 1986 makes the interception and monitoring of electronic communications unlawful, this does not apply when those communications pertain to business, particularly when said communications are on company-owned devices (Beesley, 2012). A 2007 survey of 294 US companies by the American Management Association and the ePolicy Institute found that of those with 1000 or more employees, over a third employed people to read their employees’ outgoing mail, and of these about three-quarters used electronic tools to automatically monitor email (American Management Association, 2008). Additionally, the survey found that 66% of employers monitored their employees’ Internet activity, and nearly half of the employers tracked content, keystrokes, and time spent at the computer.

Workplace monitoring technologies and programs have also developed in ways that are more visible than key-logging and less ominous-seeming than CCTV cameras. For instance, several high-profile employers, like BP America, have adopted Fitbit, a fitness-tracking device, for some of their employees in a bid to improve employee health habits while simultaneously persuading insurance companies successfully to reduce their rates, at significant savings to the company (Bort, 2014). While employees can technically opt in or opt out of a company health and wellness program, without the

furtive actions required to duck out of view of surveillance cameras, the employees who willingly comply with it may be perceived as higher-value to their employers. Moreover, employees who opt-out can suffer real financial costs. The pharmacy company, CVS, is currently being sued by an employee for its health-screening program, which allegedly requires employees to disclose items like weight and level of sexual activity (Burman & Stuart, 2014). Employees who opt out of the screening program, but still want to use the company's health plan pay \$600 more per year than employees who comply with the screening (Burman & Stuart, 2014). Additionally, even in wellness programs that rely on reward incentives rather than punitive measures to achieve compliance, it might be tough for an employee to object to a health-monitoring program when they will be seen as more risky for their employers than those who do comply. Furthermore, without being able to measure the direct harms of surveillance, it's hard to account for the privacy costs to employees of employers tracking their fitness and health information.

Not all health and wellness programs necessarily ask for information that seems invasive to employees' privacy; moreover, even though an employer is sponsoring the program, it does not mean that they have access to the information that's collected, or can use it to any purpose. Some employees bring information about their disabilities to the HR departments of their employers in order to discuss how they can be accommodated in the workplace. There is an implicit and often explicit understanding that the information they use to negotiate accommodations for their disabilities in the workplace will not affect their job security. Legally, disability information cannot be used to make hiring or promotion decisions about job candidates or employees, but employees may fear that their performance evaluations will be affected by the sensitive information that they share in ways that can mask discrimination. Generally, sensitive information that is gathered or revealed, and which is not necessarily protected by civil rights legislation, may make employees feel more vulnerable to surveillance in the workplace. Policies that help to govern how new forms of information gathering and sharing act to empower or disempower stakeholders can help balance the benefits of monitoring with the implicit threat it can introduce into the workplace.

Technology and Control

Direct and active electronic monitoring can create rigid technological control over standardized work activities, but the oppressiveness of this rigidity can also elicit forms of resistance. For example, stockers in an Amazon warehouse have their movements tracked as they load and unload products from docks, and their minutes and distance are catalogued as they crisscross the lengths of the warehouse (McClelland, 2012). All this is part of Amazon's efforts to study and produce the most efficient methods for completing tasks, but the bottom line for the workers is that they will be fired if they don't hustle (Head, 2014). Another popular method of active, detailed tracking is prevalent in call centers, which typically use an Automatic Call Dialing System (ACD)

that can feed, time, and record calls, as well as track administrative work between calls (Lankshear et al., 2001, p. 598). It can also keep logs of sign-ins and sign-outs to the system. In addition to an ACD system, employers surveil employees by accessing their calls or call recordings remotely to evaluate agents and their interactions (Lankshear et al., 2001, p. 598). Calls can be fed to the caller every 3-4 minutes without breaks, and customer interaction is scripted to reduce opportunities for work avoidance (Mulholland, 2004, p. 709). However, callers use a variety of methods to regain control, such as talking to an answering machine and recording the interaction as a sale (Mulholland, 2004, p. 709).

More passive monitoring, where the emphasis on control is not as tangible, may operate differently on a worker whose activities are recorded, but not actively tracked, as a sort of remote or distant threat to act in compliance with the expectations of their workplace. The data collected by passive monitoring of employees is generally used to pinpoint what went wrong in the aftermath of some incident that hindered the efficiency of an operation (Mulholland, 2004, p. 709). However, passive monitoring technologies can also blur lines between efficiency-oriented and toxic or demoralizing workplace surveillance. For example, a surveillance product called SureView allows employers to log every keystroke employees make, track their emails, and browsing histories in an effort to discover instances when employees may have some malicious intent (Shahani, 2014). If an employee has a file that they put onto a USB stick, the program will reveal the contents of that file to the employer in real-time so that they can identify if that file reveals company secrets, on the suspicion of ill-intent, rather than an operational deficiency (Shahani, 2014).

Recruitment, Surveillance, and Care

The types of surveillance exerted from the workplace also function to create opportunities for inclusion and exclusion, both in the recruiting stages of employment and in advancement or movement of employment after hiring. At a basic level, having the right kinds of identification (social security number; government-issued photo ID) (Goffman, 2014, p. 40) and, at a more advanced level, being willing to submit to drug testing, personality testing, or Facebook monitoring can strongly impact or outright determine entry into the workforce. Some of these acts of surveillance occur only as a singular event or as a series of random ones, while techniques like call monitoring or key-logging are typically ongoing.

The so-called human element of worker monitoring was introduced by a strong adherent to Taylorism, the psychologist and engineer Lillian Gilbreth, who developed personality and psychological testing for personnel management (now Human Resources) in the 1930s that has become a central tenet of modern management theory (Saval, 2014, p. 56). Not only would workplaces, like offices, be designed so that workers would internalize their boss' gaze, but the addition of these testing methods signaled that the boss was genuinely trying to get inside employees' heads (Saval, 2014, p. 61).

Functionally, personality testing affects a certain participatory acquiescence by workers who consent to be monitored because it normalizes monitoring as a condition for entry or promotion in the workforce, at least for large employers. A 2011 survey by the Society for Human Resource Management found that only 18% of employers use personality tests, mostly for mid-level managers (56%), executives (45%), and entry-level exempt jobs (43%), although they found that 71% of HR professionals think personality tests are useful (Society for Human Resource Management, 2011). The potential of monitoring technologies to infer sensitive information from the material that is monitored, like references to personal events, can create tensions or acts of resistance to “mission creep” or “function creep” (Ball, 2010, p. 92), and can even violate the law. For instance, employers are prohibited from testing for or soliciting information on employees that would indicate they are susceptible to mental illness (Dattner, 2013). Workplace personality testing has come under scrutiny for inadvertently or purposefully discriminating against job candidates with mental health issues by screening out candidates who answer affirmatively to statements like, “Over the course of the day, I can experience many mood changes” (Weber & Dwoskin, 2014).

Recruitment procedures, particularly in the service industry, routinely require job applicants to undergo criminal history background checks and drug tests. The latter can occur perennially, although most drugs leave the body’s system within a few days, so these are jokingly referred to as “intelligence tests” that examine who fails to outwit them, according to Ball (2010, p. 91). More problematically, urinalysis intended for drug screens can also potentially reveal information about some medical conditions that a person may have, albeit with a higher false-positive rate than a blood test would incur, such as certain nephritic conditions, uncontrolled diabetes (MedicineNet, 2014), and pregnancy, along with other sensitive information (Information and Privacy Commissioner/Ontario, 1992, p. 8). Employees have to trust that the inferred or available health information will not be used against them, or to a purpose beyond the stated intent of their employers or the test. As the ACLU (2002) reports, “[i]n 1988, the Washington, D.C. Police Department admitted it used urine samples collected for drug tests to screen female employees for pregnancy - *without* their knowledge or consent.” Although there is no evidence to suggest that employers are using urinalysis drug tests to screen employees for medical conditions on a broad scale, workers may have cause to be concerned if their employability rests on keeping their sensitive medical information private. The possibility that a form of surveillance will capture more extensive information can create a stratification of vested privacy interests. While some workers might object to surveillance because it conflicts with their sense of cultural autonomy, others might fear that sensitive information about them could directly harm their prospects for promotion.

There have been incidents that highlight how drug-testing in the workplace can be subject to abuses of its intended or stated purpose. For example, in *Ferguson v. City of Charleston* (2001), the U.S. Supreme Court ruled that the Medical University of South Carolina’s use of urinalysis to detect drug use in pregnant employees violated the

employees' Fourth Amendment rights¹ to be free from unreasonable searches because the University fed positive results of drug use to police (Weiner, Reichman & Cummings, 2001). The employees who refused to attend a drug rehabilitation program were promptly arrested (Weiner et al., 2001). Clearly, the degree of control or coercion that employers can assert over employees through monitoring is limited in some ways, but it can be difficult to draw a line in the sand because of the varied interests that different stakeholders have in the practice of surveillance. The Hospital, and the State, might have a valid vested interest in preventing drug use in their pregnant employees, and may be justified in conducting drug tests or suggesting rehabilitation programs; the line between acceptable and unacceptable enforcement methods was crossed when police were summoned to arrest employees who were not compliant with the Hospital's intervention.

Policies in the workplace that demand intrusive inspection of employees, particularly of their private lives and their health, can raise the specter of hawkish oversight, and can lead to employee resistance. For example, research conducted on an Irish call center revealed that employees are obliged to go through a back-to-work interview every time they take one day of sick leave (Mulholland, 2004, p. 719). If an employee stays away for three non-consecutive sick days, the illness is monitored, and physician's notes may be required. More problematically, employees who are only sick for one or two days are not compensated; they only receive sick day pay if they are out for more than three days. New hires are not granted sick days until they've been with the company for six months. Employees resistant to these leave policies and this particular type of bio-surveillance would sometimes stay away for more than three days instead of one, exacerbating absenteeism in response to managerial controls perceived as punitive or insulting (Mulholland, 2004).

Like most surveillance technologies, the practices of employee monitoring are inflected with narratives of safety, but they also often stem from an earnest desire to improve workplace management. For every tale of workers' resistance to paternalistic devices that monitor their performance, there is an additional story of a junior employee who is rendered suddenly visible to upper management because monitoring technologies identify him as a vital node in a social network that helps hold the organization together (Smith, 2014). Surveillance is usually multi-purposed and comes with a range of opportunities and disadvantages, which is why it is challenging to either support or reject it wholesale. For instance, the monitoring technologies that highlight which employees are more important to how a workplace functions can also be used by employers to identify incidents of employee theft (Lohr, 2014). An employee who objects to the notion that they are being viewed as a potential thief by their employer may

¹ "The Court held that this procedure was in violation of the Fourth Amendment because the state interest (i.e., providing treatment for drug-abusing pregnant women) was inseparable from the law enforcement function. The fact that the police used the information to arrest and prosecute women violated the special needs doctrine." (Weiner, Reichman & Cummings, 2001)

accept and look forward to the possibility that their hard work will be rendered visible to upper management.

New monitoring technologies often track relational data (rather than attribute data, like gender or age) about who talks to whom. Sociometric Solutions, which has clients that include the Bank of America and Cubist Pharmaceuticals, uses sensors placed on employee identification badges to track who is talking to whom, for how long, with what tone of voice, how quickly they speak or when they interrupt, etc. to try to identify what makes for a good team and what does not; in one instance, they discovered that the most important interactions between salespeople outside their teams happened at the coffee machine (Brustein, 2013). The company does make some allowances for privacy concerns by withholding individualized data from the companies that use their services (Brustein, 2013), but these workplace improvement efforts still trigger concerns about loss of agency and control.

Privacy concerns are particularly salient because certain employers have been permitted by law to hold the private-life actions of their employees accountable to the standards of their workplace. For example, a teacher was forced to resign for modeling work she did in a bikini, which the school considered sexually explicit and in breach of their standards (Huffington Post, 2013). In response to the blurred line between private and public life, especially in digital spaces, the Electronic Frontier Foundation published guidelines for bloggers on how to remain anonymous on the Internet so that their employers don't catch them writing criticism that can be construed as disloyal, and which could lead to termination (Ball, 2010, p. 92). Increasingly, connectivity, identifiability, and surveillability are inherent to what social spaces and communication technologies are becoming, whether they are for work, study, hobbies, or combined use.

Case Study: Truck Drivers

Governmental authorities usually see workplace surveillance in terms of keeping the public and workers safe, but as researcher Karen Levy (2014, personal communication) observes, the rhetoric and methods of safe-keeping can also serve as scaffolding for employers to expand beyond the safety mandate into more intrusive monitoring practices. For example, the Federal Motor Carrier Safety Administration, which regulates trucks and truck drivers, is making efforts to integrate electronic monitoring devices into trucks as a way of enforcing its time limits on how long a driver can be on-duty, which are designed to prohibit accidents that result from fatigue (Levy, forthcoming). If companies will be forced to install electronic on-board recorders (EOBRs), the cost of implementing that mechanism alongside others that serve the employer's organizational aims, like devices that capture information on a driver's fuel efficiency, idling time, or instances where the driver goes off the pre-determined route, is reduced (Levy, forthcoming). Still, while a variety of EOBRs are already used in the trucking industry, they are a cause of concern for truckers who cite occupational

autonomy and privacy as points of contention; for instance, they may object to having their location tracked when they are off-duty in their trucks or on their way home.

Resistance to monitoring in general is complicated by the fact that some degree of monitoring is acceptable to most workers, and can effect or normalize compliance, such that the legitimacy of resistance depends partly on the legitimacy of the monitor and the technology used (Ball, 2010, p. 89). According to Levy's (2014) research, truck drivers pride themselves culturally on their autonomy on the open road and away from managerial oversight in close working quarters. They engage in an array of surveillance-evasion tactics, from falsifying paper logbooks to destroying EOBRs with rubber mallets, or hacking them to play solitaire. However, resisting control is not just about cultural cowboyism or regaining control over time; it is also borne of deep economic necessity, and exemplifies how resistance itself can be participatory in a form of worker exploitation. Truck drivers are usually paid by the mile; if they resist EOBRs, it's not necessarily because they object to the notion of putting boundaries on their working hours or scoff at the notion of driver fatigue: the limitations enforced by EOBRs would make it impossible for them to earn a living for themselves and their families under the current pay structures and regulatory requirements. Thus, they often feel forced into self-exploitation in order to survive.

In some circumstances, employers may be complicit in undermining governmental attempts to monitor workers because they have contradictory economic motives for monitoring them (Levy, 2014, p. 7). For example, Levy observed a dispatcher advising a truck driver to "roll" for several miles, driving below the speed threshold that would activate the EOBR. The dispatcher suggested this because the driver was approaching his 14-hour daily, legally mandated on-duty limit (Ibid., p. 16). While the employer has a vested interest in safeguarding drivers from accidents that are the result of overworking, they also need freight to arrive at its destination on time.

Surveillance practices come with many overlapping layers of logic – what is reasonable from a business, governmental, or employee perspective - that help determine which monitoring practices are acceptable, or what modes of engagement with them are appropriate. These practices are wrapped up in a technology that enables ever-increasing forms of monitoring to stretch our current frameworks for understanding labor relations.

Contemporary Shifts: The Knowledge Economy and Re-Skilling Workers

The shift from an agriculture and manufacturing-dominated society to a so-called "knowledge economy" is producing new conceptions of what monitoring controls are necessary to achieve productivity. How can employers assert control over the indeterminate nature of a worker's knowledge? This concern is rooted in the changing nature of employment, as workers shift to a model where they compete to have employers purchase their services by being relevant and up-to-date on innovations and

developments in their fields—a departure from a system where their supervisors forced them to maximize their labor outputs by reducing the cognitive aspects of their work (Sewell, 2005, p. 693). The old Taylorist move to de-skill work activities and to relieve the cognitive demand that traditional work places on employees is being supplanted in management theory by the recognition that all work places cognitive demands on employees, and that giving employees room for discretion helps to co-opt their knowledge to increase operational efficiency. Sometimes this comes in the form of literal rooms in physical office workplaces or unregulated social spaces (Sewell, 2005) or ‘zones of privacy’ (Bernstein, 2012, p. 1) that are allocated for workers to gather in without their bosses around. As sociologist Arne Kalleberg (2013) notes, there is a large body of literature that discusses how worker autonomy is a major factor in what makes a good job distinct from a bad one. Sometimes the absence of surveillance can be just as rewarding as a system that uses employee monitoring to identify and reward workers based on how that system scores their performance.

In a factory in China that manufactures mobile phones, researchers from the Harvard Business School (Kalleberg, 2013) recently experimented with surveillance by sectioning off some workers from broader view with curtains, and found that they were 10-15% more productive than their un-curtained colleagues, in part because they were more willing to share tips when they had some measure of privacy (Lohr, 2014). Explicit methods of overt surveillance are potentially becoming less relevant to productivity, whereas explicit efforts to achieve privacy in a heavily surveilled workplace can have real benefits by giving workers a sense of control and autonomy in their environments. In other words, if de-skilling workers in the Taylorist management model leads to resistance by workers who do not enjoy participating in automated efficiency systems, humanizing their workplaces with space for privacy and discretion can encourage good workers to give their labor and knowledge more willingly.

There is a trend in workplace management, particularly in the area of digital labor, geared towards projects, or contained task-oriented results that can be outsourced to independent and flexible workers whose collaboration is supported by ubiquitous technologies and infrastructures (Boyer, 2014). The transactional cost of monitoring traditional employees shifts to the independent worker, who has to self-monitor to deliver their part of a given project (Neff, 2012, p. 18). This shift in the labor market and in the workplace environs is partially a function of employment policies stemming from the mergers and layoffs that characterized the 1980s, which forced people out of a permanent workforce and into contract-based temp or perma-temp positions (Saval, 2014, p. 293) that continue to characterize “at will” employment culture.

Work that is unrestricted by time or place offers opportunities for remote control by “soft surveillance” (Saval, 2014, p. 297), which indicates that the digital revolution may be just as significant as the industrial revolution in its impact on employee monitoring. The soft monitoring power exerted by Internet-connected devices that mediate communications between employers and workers elicits a sort of “coerced

volunteerism" (Marx, 2005) from workers, so that they respond to or comply with work expectations or demands off the clock out of performance anxiety and a desire to appear professional (Gregg, 2011, p. 145). This is distinct from the involuntary compliance associated with "hard surveillance," like requiring job candidates to take mandatory drug tests or to supply their Social Security Number.

Ubiquitous technologies like smartphones, laptops, and general Internet accessibility enables employees to carry their workplace devices in transit and into the domicile, and for the private actions of their networked selves to reverberate back to their workplaces. In retail, the practices of haphazardly scheduling part-time employees to perform full-time hours without having to classify them as full-time, and thus be able to deny them the associate benefits, is well documented (Center for Law and Social Policy, Retail Action Project, and Women Employed, 2014, p. 3), but the practice is enabled in part by the technology that allows workers to be accessible on-demand. In a book that explores how new technologies, like smartphones, tablets and laptops, enable and support a tendency for professionals to bring their work home with them, the socio-cultural theorist Melissa Gregg (2011) relays the tension this creates as the line between the workplace and the domicile is blurred: "Should I answer that email tonight after my last glass of wine? Do I have to be friends with my colleagues on Facebook? Will my son know if I'm listening to him from the other room as I finish this overdue presentation? Does my boss even know when I am at work?" (p. 6).

The existence of a technology that both mediates employment opportunities and acts as a tracking monitor can create greater accountability of employers towards their contractors—and to the public. This became evident recently after a driver for Uber, the cab-on-demand transportation network, who is legally classified as a contractor (not an employee), has flexible work hours, and works from a privately-owned vehicle, hit and killed a child. Uber initially denied responsibility for the driver because there was no passenger in the car, an argument that implied that the driver was off-duty (Welch, 2014). After the family of the child sued, Uber expanded its driver insurance to cover drivers who are logged into the app and available to accept a ride, even if there is no Uber passenger inside. The tool that tracks and monitors the movements and timing of contracted drivers formalized a connection between the Uber platform and its contractors created larger accountability and responsibility for the more powerful party, and eliminated the gray areas surrounding driver service terms (if he or she is on or off-duty) in an unwittingly positive example of "mission creep" (Rosenblat & Stark, 2014). The contractor who is logged-in is, in this sense, more secure than the worker who feels insecure because she doesn't know if her boss knows that she is working, or whether her son suspects her of working at home. In some cases, the absence of direct surveillance or supervision can be freeing for the worker. In other cases, a worker can assert greater control over their employer by pointing to surveillance as proof of mutual interest and responsibility. However, Uber's instantiation of employer-labor relations is significant because it signifies that the protections we associate historically with unionized labor are absent from contract labor. The protections that do emerge are arriving haphazardly as a

function of incidents like the above example, rather than because there has been an intentional restructuring of labor protections that match the current labor market. Surveillance is implicated in these dynamics because it tethers employees to employers and creates new terms for work, both in positive and negative ways.

Contract workers strive to maintain their employability, for they know they lack employment security. Sometimes this is a choice and comes from a preference for flexibility, but more often it is because the indeterminacy of labor is a structural condition of the workplace. As a result of trends in the workforce that emphasize flexible and contract labor, the monitored and quantified worker is giving way to the reflexive monitoring self who manages their own efficiencies and their own brand and reputation (Lupton, 2014). Flexible, post-industrial workers have to be both entrepreneurial and inherently exploitable (Nguyen, 2014). In other words, independent workers are absorbing more of the costs of doing business and do so with less security, thus providing a twist on the notion that surveillance is itself the source of security. Just as truckers who resist surveillance to maintain their autonomy effectively exploit their own labor to support a system that wouldn't pay them enough in wages if they followed the rules to sustain themselves and their families, those who work at gigs as contractors or micropreneurs in the peer economy swallow the costs of being self-employed, without the sizeable financial rewards and social capital we associate with successful entrepreneurship. Is self-monitoring in a floating workplace a more or less desirable form of surveillance than employee monitoring in its more traditional forms?

The dynamics of control that workplace surveillance enacts on employers and employees theoretically perform a safe-keeping function as well, guarding employees and employers alike from time-theft, for instance, although employees are generally much more vulnerable to exploitation than employers are because they have less social and monetary capital to assert remedies against large employers who abuse time sheets. By contrast, a temporary or long-term contractor working at gigs has to swallow the costs involved with self-employment, including the time spent seeking out work or getting to gigs and the transport costs, like gas and insurance, but this freedom from direct oversight comes with a price (Singer, 2014). This price invites us to consider the broader costs or values of surveillance and what it implies for labor protections, as well as what the absence of surveillance signifies. Does it communicate a belief in a worker's competence, or a lack of care for their safety and protection? How do we measure the safety that a monitoring system offers to its stakeholders? Evidently, the line between workplace surveillance as coercive and protective/ performance-enhancing is in constant tension in labor relations, especially as work shifts beyond a specific, bounded location and spills over into a multiplicity of spaces and sites that are neither entirely private nor explicitly the purview of employers. These changing conditions of the workplace invite us to consider which forms of workplace surveillance are beneficial, disadvantageous, or necessary to sustainable labor and efficient processes, and what the effects of monitoring are on workers in a range of workplaces.

Conclusion

The literature on surveillance offers a lot of descriptive explanations about workplace monitoring, but there is a dearth of specific metrics for understanding how it changes over time. There remains a gut feeling that monitoring is invasive or sinister, but the debate about it happens at a descriptive level, rather than at a level that can account for temporal change. Part of this has to do with the proliferation of new technologies that make monitoring more efficient and less expensive. However, while the literature on sociology and surveillance studies credits this reduction in costs with the rise of surveillance technologies, there is a dearth of specific information about what these costs are; how they change over time; and what the material value of alternatives to direct surveillance are.

There is an unchallenged assumption that employers monitor their employees simply because they can, and that they do so more intrusively for the same reason—especially as technologies evolve to enable more and more methods of surveillance. But, would it be valuable to measure these shifts and evolutions? As it stands, the literature indicates that there isn't a point of mutual consent amongst all parties involved; instead, there is a mutual understanding or complicity in acknowledging what is happening as the boundaries of what is possible stretch uncomfortably into the blurry terrain of what is permissible and what is considered a violation. What are the privacy concerns that workers have about the surveillance data that is collected on them? How could it influence their future job prospects? Numerous other questions emerge as well: to what degree are these new tools exacerbating a power differential between employers and laborers? What constitutes "labor" and what divides it from home life? When labor is no longer bounded by the spatial constraints of a physical location, what are the new frameworks we have to consider when thinking about labor and its protections? And, what should we be measuring to understand what is happening? These questions represent significant gaps in the literature on workplace surveillance that merit attention and thoughtful consideration.

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