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Article

# Power, Stress, and Uncertainty: Experiences with and Attitudes toward Workplace Surveillance During a Pandemic

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## Abstract

There is a rich literature on technology's role in facilitating employee monitoring in the workplace. The COVID-19 pandemic created many challenges for employers, and many companies turned to new forms of monitoring to ensure remote workers remained productive; however, these technologies raise important privacy concerns as the boundaries between work and home are further blurred. In this paper, we present findings from a study of 645 US workers who spent at least part of 2020 working remotely due to the pandemic. We explore how their work experiences (job satisfaction, stress, and security) changed between January and November 2020, as well as their attitudes toward and concerns about being monitored. Findings support anecdotal evidence that the pandemic has had an uneven effect on workers, with women reporting more negative effects on their work experiences. In addition, while nearly 40% of workers reported their employer began using new surveillance tools during the pandemic, a significant percentage were unsure, suggesting there is confusion or a lack of transparency regarding how new policies are communicated to staff. We consider these findings in light of prior research and discuss the benefits and drawbacks of various approaches to minimize surveillance-related worker harms.

## Introduction

Global shutdowns began in March 2020 to contain the spread of COVID-19. During these early weeks, employers had to make quick decisions regarding the future of their businesses and employees. While industries like retail and hospitality were forced to lay off workers or shut down operations, others—including finance, technology, and education sectors—shifted most employees to remote work. Data from a 2020 Pew Research survey found that 40% of American adults said their job could be done remotely (Parker, Horowitz, and Minkin 2020), while early data from MIT found that 35% of Americans surveyed in April/May of 2020 said they had previously commuted but were currently working from home (Brynjolfsson et al. 2020).

In addition to identifying technologies to support worker communication and collaboration from home, employers also began exploring technological solutions to monitor worker productivity from afar. While not new, employers now use a variety of techniques to monitor employees both at the office and when working remotely, and the pandemic accelerated demand for technological solutions to track employee productivity. For example, Hubstaff collects data about workers' clicks, typing, and mouse movements to create a productivity score, taking a screenshot every few minutes and capturing website browsing; in the case of a *New York Times* writer, the software captured family members in the background as he worked in

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his kitchen and a two-hour break he took in the middle of the workday to go on a bike ride with his children (Satariano 2020).

Beyond Hubstaff, companies around the world implemented new tools to track employees' productivity, location, interactions with coworkers, and health measures. Amazon deployed portable monitoring units around its warehouses that included cameras, sensors, and a monitor that displays and records when employees are closer than six feet from each other and whether they are wearing masks (Lee 2020). Looking at remote workers, companies like Microsoft developed new analytics tools that feature a "productivity score" for each employee based on factors like email responsiveness, app usage, and general communication activity. Dashboards are even provided so employees can compare themselves with peers, and managers can monitor workers in real-time (Hern 2020).

While the shift in how and where work takes place during the pandemic has been well documented, what has received less coverage is how the months spent working from home—and being electronically monitored in sometimes invasive ways—affected workers' attitudes toward their job. In this paper, we analyze data from a national survey of 645 US workers comparing their workplace attitudes at the start of 2020—months before lockdowns began—with that at the end of 2020 to understand the pandemic's potential impact on job satisfaction, stress, and security, and their attitudes toward increased surveillance by their employers.

Our findings highlight disparate effects of the pandemic on workers: women reported larger negative shifts in their job stress and concerns about job security than men, and those working on-site during the pandemic expressed significantly higher job-related stress than those working remotely. Further, while workplace monitoring was common among our respondents, many said they were less confident they had full awareness of their companies' monitoring policies seven months into the pandemic, and nearly one-quarter said they weren't sure if their employer had added any new policies since the start of the pandemic.

In the following sections, we highlight prior research on workplace surveillance and how changes in monitoring technologies have impacted workers, then discuss the rapid evolution of working monitoring practices and technologies that became widespread during the COVID-19 pandemic. We then describe our data collection and present key findings from our survey, comparing respondents' experiences at work pre-pandemic (January 2020) and at the time of data collection (November 2020), as well as their concerns about future forms of workplace surveillance. We conclude by considering the implications of this data for post-pandemic work environments.

We note that many workers have expressed a desire to continue working from home—at least some of the time—in the future (Parker, Horowitz, and Minkin 2022). Even after workers return to the office, however, some employers may continue monitoring programs because of perceived benefits. This highlights the slippery slope of workplace monitoring practices and provides additional evidence that technology-driven "function creep" is a real concern for employees regardless of their physical location. In light of this, we encourage companies to be more transparent about both *what* technologies they use to monitor workers and *why* they use them, while acknowledging that such practices are only part of the solution. More robust protections for workers will likely depend on increased attention to workers' rights and better federal regulations to protect workers and their data.

## Related Work

Workplace surveillance has existed since the era of industrialization. Spurred by the emergence of Taylorism and Fordism in the early twentieth century, workers have increasingly been exposed to—and become accustomed to—the monitoring of their labor and workplace interactions. From an organizational perspective, workplace surveillance has been justified to increase worker productivity, ensure workplace

safety, mitigate employee theft, and generally support company interests. In her canonical work exploring the history of workplace surveillance, Ball (2010: 89) notes how business organization and surveillance go hand-in-hand, writing: "Clocking in, counting and weighing output and payment by piece-rate are all older forms of workplace surveillance. Business organizations are hierarchies, and hierarchies function by superordinate positions monitoring and controlling positions below them in the hierarchy."

Employers may also conduct surveillance to gain a sense of greater control or to reduce risks in their operations, or simply because new technologies for monitoring are convenient, pervasive, and increasingly inexpensive to implement. Ball (2010) organizes the various motivations and targets of workplace monitoring within three (often overlapping) categories: performance, behaviors, and personal characteristics. Performance monitoring includes the use of cameras to observe employees on the job, listening in on customer service phone calls, or tracking the location of delivery drivers—all with the goal of enhancing productivity. Behavior monitoring extends the workplace gaze beyond performance evaluation toward more disciplinary functions of shaping certain behavioral traits. It might include scrutinizing communications with a focus on tone or politeness, drug testing, or enforcing codes of conduct designed to support a particular corporate culture. Monitoring of personal characteristics might include psychometric testing prior to hiring, collection of biometrics for security and access controls, and corporate wellness programs that track employees' health and fitness.

In the US, federal regulations and legal precedent broadly allow these types of workplace surveillance (Ajunwa, Crawford, and Schultz 2017). The Electronic Communications Privacy Act of 1986, for example, allows business owners to monitor employees' verbal and written communication, and related activities on company-owned equipment, as long as the company has a "legitimate business reason" for doing so (Nord, McCubbins, and Nord 2006). Similar regulatory environments have allowed employee monitoring—in varying degrees—to flourish in other jurisdictions, including the United Kingdom (Lockwood 2018) and Australia (Brown and Witzleb 2021), as well as Canada and the European Union (Lasprogata and King 2004).

Yet, in the last decade, technological advancements have clearly enhanced the scale, scope, and accuracy of workplace surveillance across all of Ball's (2010) categories. Employer-provided laptops and cellphones enable real-time monitoring and location tracking. Biometric handprints have replaced punch cards, and internet browser histories are often scrutinized closely. New monitoring tools can capture photos of computer screens at random and access webcams to take photos of workers at their computers; some tools can "instantaneously detect anger, raised voices or children crying in the background on workers' home-office calls" (Shellenbarger 2008). In many ways, the rapid evolution of workplace monitoring technologies has put new pressures on the frameworks meant to balance their use against workers' privacy rights (Charbonneau and Doberstein 2020; Ebert, Wildhaber, and Adams-Prassl 2021).

Further, Mateescu and Nguyen (2019) note how workplace monitoring practices are increasingly focused on *wholesale* data collection. They write that companies are "collecting new kinds of data about workers, enabling quantification of activities or personal qualities that previously may not have been tracked in a given workplace—expanding the granularity, scale, and tempo of data collection" (Further, Mateescu and Nguyen 2019: 1). And the deployment of these more pervasive practices is becoming commonplace: a 2019 survey of 239 large corporations revealed that half were using "nontraditional" surveillance methods, including logging and analyzing phone calls, scrutinizing emails and social media posts, and tracking who attends meetings (Wartzman 2019). As such, workplace surveillance can be seen as becoming increasingly universal in both its reach and breadth.

Too often, however, the harms posed by workplace surveillance fall most heavily on the most vulnerable workers (Browne 2015; Stark, Stanhaus, and Anthony 2020), exacerbating economic inequalities and power imbalances that prevent workers from avoiding or challenging these increasingly invasive practices (Introna

2002; Levy 2015; Rosenblat, Kneese, and boyd 2014). While employers argue that monitoring is an inexpensive way to increase productivity, critics frame it as the modern method for exerting power and control over labor. Monitoring has been used to determine pay and promotion decisions as well as to reinforce disciplinary actions. The AFL-CIO, for example, objects to monitoring because it "invades workers' privacy, erodes their sense of dignity and frustrates their efforts to do high-quality work by a single-minded emphasis on speed and other purely quantitative measurements" (qtd. in Lund 1992: 54).

Dating back to 1987, the United States Office of Technology Assessment (OTA) (1987: 1) report on "The Electronic Supervisor: New Technologies, New Tensions" stated that advances in electronic monitoring raised questions about fairness and privacy in regard to employer surveillance of employees, noting that employees had little power to object to what they considered "unfair or abusive monitoring." More recently, Nguyen (2021) noted that workers' lack of insight into how they are tracked and how their data are used leads to employment insecurity, a shifting of risks and costs from employers to workers, and an exacerbation of racial profiling and bias. She writes: "Workers currently don't have power over the technology that directs their jobs, nor do they retain rights over their data in the workplace. This creates a tremendous and invisible power imbalance between workers and companies" (Nguyen 2021: 5).

## COVID-19 and the Rapid Shift to Remote Work—And Remote Monitoring

The sudden shift in work practices due to the pandemic reduced worker power even further in the face of new and accelerating surveillance practices that increasingly bridge the gap between one's workplace and home. Advanced software tools have been deployed to monitor and assess worker productivity based on factors such as email responsiveness, engagement with new workplace communication channels, and even monitoring other active windows on a worker's home computer (Harwell 2020; Hern 2020; Satariano 2020). The pandemic has increased interest in surveillance platforms like Hubstaff (referenced in the introduction), TSheets (a mobile app that can track phone location during work hours), and Time Doctor (software that can discreetly screen record and capture a picture of the employee through a webcam every ten minutes) (Allyn 2020), among others. With the rapidly increasing technological sophistication of remote employee surveillance, we see Ball's (2010) categories of workplace monitoring—performance, behaviors, and physical characteristics—collapsing into pervasive surveillance systems that intrude into all aspects of employees' lives and activities, even when not "at work." As one worker commented to *Recode*: "My manager knows every single damn thing I do.... I barely get to stand up and stretch, as opposed to when I am physically in the office. I feel like I have to constantly be in front of the computer and work because if not, either the TeamViewer logs me out for being idle, or my manager randomly sends a check-in email that I must reply to promptly" (qtd. in Morrison 2020). Kniffin et al. (2021: 66) describe the multitude of working-from-home monitoring practices as "virtual sight-lines," meant to replicate the in-person practice of managing-by-walking-around. Yet, they note these virtual sight-lines come with risks, including increased stress due to constant monitoring, increased centralization of management, and decreases in employee creativity, especially for those in lower-level positions.

To further explore the pandemic's impact on workers, we pose the following research questions. First, we seek to develop a baseline understanding of how work experiences changed throughout 2020, focusing on hours worked, job satisfaction, job stress, and job security concerns. We ask:

> **RQ1:** How did employees' work experiences change during the early months of the pandemic?

Once we have established this baseline, we seek to understand how employees' experiences with workplace monitoring changed during the pandemic. For example, how did policies change as workers shifted to working remotely? Did workers feel confident they knew about these changes, and did they see these

changes as appropriate and acceptable? Were employees concerned about increases in surveillance during and after the pandemic? We ask:

> **RQ2:** How did workplace monitoring practices—and employees' attitudes toward those practices—change during the early months of the pandemic?

## Methods

In October 2020, seven months into the COVID-19 pandemic, we developed a survey instrument for office workers who had been affected by pandemic restrictions. In particular, we were interested in changes to their work environment and experiences due to the pandemic. The survey included three sections: (1) demographics and background questions; (2) workplace questions, including items about their job security, satisfaction, and stress at both the start of 2020 (before the pandemic lockdown began) and at the time of data collection, as well as monitoring practices used by their employer; and (3) factorial vignettes to explore attitudes toward various types of monitoring. In this paper, we focus on the first two sections of the survey.

After receiving IRB approval for the study, we contracted Qualtrics[1] to recruit a national, gender-balanced sample of American workers who met the following criteria—worked in the US, aged 18+, employed by the same company since at least January 2020 (to ensure they were at the same job for pre-pandemic and current assessments), and worked from home for at least part of the pandemic.

The survey launched in November 2020. Qualtrics first collected fifty responses for the research team to review before launching the full data collection effort. During this stage, we identified several problems, including potential survey completion by bots, so we took additional measures, adding two attention check items and replacing any responses that included straight-lining (i.e., the respondent choses the same response for several items in a row). Qualtrics also removed responses that were completed too quickly; median completion time was nine minutes, so we set a minimum completion time to six minutes. The lead author reviewed each response and removed problematic cases, such as those that included gibberish (e.g., random string of characters) in response to open-ended questions. This process led to a final dataset of 665 responses. During data cleaning, twenty additional cases were removed due to data abnormalities or cases where the respondent indicated they were retired/no longer working.

Among those included in the final dataset (N=645), 46.2% identified as a woman, compared with 52.7% who identified as a man.[2] Most participants (84.2%) identified as White, while 7.1% identified as Black, and 4% identified as Latino. The average age across all participants was 44 (*SD*=13.3). Most participants (76.9%) had at least a bachelor's degree. More than one-third (36.7%) reported an annual household income below $75,000, while 19.1% reported income above $150,000.

### *Survey Measures*

In this section, we describe measures computed from the survey items to facilitate additional analyses. Note that for items that addressed a specific time (January 2020 or November 2020), respondents first answered a series of questions about the start of the year, with language clearly stating they should think about their work environment in January. On a separate page, respondents were asked to think about their current (November 2020) work environment. In addition to these instructions, each item had timing-specific

[1]For more information on Qualtrics panels, see Qualtrics Panel Management Guide: https://www.qualtrics.com/ebooks-guides/panel-management_guide/. Participants in these panels typically have an option for how to be compensated (e.g., gift cards, donations to charities).

[2] We included options for non-binary or other gender identities; however, only five people selected one of these options.

wording to minimize confusion (e.g., "How satisfied were you with your job at the start of 2020?" vs. "How satisfied are you currently with your job?").

***Workplace Characteristics.*** We first asked about the industry respondents worked in, including a list of ten popular options plus an "Other" option where they could list the industry. In cleaning the data, we reviewed "Other" responses and moved them to one of the ten categories when appropriate (e.g., "IT" was moved to "Technology"). The most common industries were Technology (n=147; 22.8%), Finance/Business Services (n=97; 15%), Education (n=91; 14.1%); Health Services (n=52; 8.1%), Construction (n=42; 6.5%), and Manufacturing (n=40; 6.2%). These six industries comprised 72.7% of responses.

We asked respondents to estimate the number of employees in their company, with seven response options ranging from 1–9 to more than 5,000. Responses were spread out across the seven categories, although they skewed toward larger companies, with over one-third (35.4%) of respondents saying their company had more than 1,000 employees. On the other end, 13.8% of respondents said their company had 1–9 employees. We also captured length of employment using five response options (less than one year, 1–2 years, 3–4 years, 5–10 years, more than 10 years). Most respondents had been with their company for a long time, with two-thirds (65%) saying they'd been at the same company for five or more years. Just 23 (3.5%) respondents had been at their job for less than one year.

We asked participants whether they worked primarily on-site, remotely, or a mix of the two at both the start of 2020 and in November 2020. As expected, the percentage of people who shifted from mainly on-site decreased significantly while the percentage of people who worked partially or fully remote increased significantly between the two times (see Table 1).

| **Location** | **Jan 2020** | **Nov 2020** |
|---|---|---|
| Completely at an employer-run location (e.g., company office, facility, warehouse) | 365 (56.1%) | 147 (22.6%) |
| Mostly out of an employer-run location (e.g., company office, facility, warehouse), but sometimes remotely/from home | 122 (18.7%) | 88 (13.5%) |
| Mostly remote/from home, but sometimes at an employer-run location (e.g., company office, facility, warehouse) | 69 (10.6%) | 180 (27.6%) |
| Completely remote/from home | 95 (14.6%) | 236 (36.3%) |

***Table 1.*** *Distribution of Work Location (On-Site vs. Remote) Before and During Pandemic*

***Work Environment Attitudes.*** We asked respondents a series of questions about their work experiences, both at the start of 2020 and at the time of the survey. They responded to each question on a seven-point scale (range -3 to 3, with a neutral 0), with the labels for each end of the scale changing based on the question. For example, respondents were asked: "How satisfied were you with your job at the start of 2020?" and (on a separate page) "How satisfied are you currently with your job?" using a scale labeled "Very Unsatisfied" (-3) to "Very Satisfied" (3). We asked these questions for three categories (job satisfaction, job stress, and job security) and for hours worked per week.

***Workplace Monitoring Practices***. All respondents were asked: "To the best of your knowledge, did your company monitor any of the following employee activities at the start of 2020? Check all that apply." We included twelve common monitoring technologies used by companies, as well as "I don't know" and "None" response options (see Table 2). More than three-quarters of respondents (78.1%) said their company used at least one of the methods included in the list.

| Type of Workplace Monitoring | N (%) |
|---|---|
| Time and attendance | 396 (61.4%) |
| Email (employee account) | 261 (40.5%) |
| Physical location | 212 (32.9%) |
| When employees log into/off the internal network | 186 (28.8%) |
| Web browsing | 185 (28.7%) |
| Phone call metadata | 112 (17.4%) |
| Employees' social media posts | 111 (17.2%) |
| Phone call content | 103 (16.0%) |
| Screenshots taken from work computers | 103 (16.0%) |
| Data from wearables or sensors | 80 (12.4%) |
| Email (personal account) | 60 (9.3%) |
| Keystrokes | 41 (6.4%) |
| | |
| None | 83 (12.9%) |
| I'm not sure | 58 (9%) |

***Table 2.*** *Frequency of Workplace Monitoring Practices. Note: Percentages add up to more than 100% because respondents were asked to select all types of surveillance their employer used.*

We asked several additional questions about company monitoring practices in the survey. First, in the series of questions about respondents' current work environment, we asked, "Since the lockdown began, has your company begun using any new technologies to monitor employees or changed prior monitoring policies?" A similar number of respondents each said yes (n=248, 38.4%) and no (n=250, 38.8%), while 22.8% (n=147) said they did not know if their company had added new forms of monitoring. We also asked, "How confident [were/are] you in your knowledge of how your company monitors employees?" for both time periods, with response options ranging from -3 (Not at all confident) to 3 (Very Confident). For January, the mean was 1.51 (*SD*=1.30), while for November the mean was 1.23 (*SD*=1.55).

Finally, we asked respondents who said their company had not instituted new monitoring technologies during the pandemic—and those who weren't sure—to indicate their level of agreement with the statement, "I'm concerned there will be increases in the amount of workplace monitoring post-COVID-19." Response options ranged from -3 (Strongly Disagree) to 3 (Strongly Agree), and the mean value was .15 (*SD*=1.70), with 46% indicating agreement with the statement and 33% indicating disagreement.

***Data Collection Concerns.*** We included eleven statements about general privacy attitudes and worker attitudes toward several forms of data collection. Using exploratory factor analysis with Varimax rotation, we identified two factors with high reliability and low cross-loading; in this paper, we focus on one set of items, which we have termed the Data Collections Concerns Scale (Table 3).

| Item | *M (S.D.)** |
|---|---|
| I'm concerned that online companies are collecting too much personal information about me. | 5.25 (1.41) |
| I'm concerned that many new tech devices collect too much personal information. | 5.40 (1.36) |
| There is too much monitoring of American workers by their employers. | 4.68 (1.43) |
| There is too much monitoring of American citizens by the government. | 4.84 (1.51) |
| **Scale (α=.81)** | **5.04 (1.14)** |
| **Note: Response options ranged from 1 (Strongly Disagree) to 7 (Strongly Agree).* | |

***Table 3.*** *Items Included in Data Collection Concerns Scale.*

## Findings

### *RQ1: Differences in Pandemic Work Experiences*

To address RQ1, we had respondents report their average hours worked per week, as well as their perceived job satisfaction, job stress, and job security for January and November 2020. Table 4 includes these items with mean scores at the two time points. Given that we know many Americans lost their jobs or were furloughed in the early months of the pandemic, we only recruited people who had been at the same job for the entirety of 2020, which avoided comparisons between two different jobs. For this analysis, we were particularly interested in respondents who changed their score across the two time periods, and we created a new binary variable to capture whether a respondent changed their score to a more negatively valenced attitude or experience between January and November 2020.

| Item | Jan 2020 Rating | Nov 2020 Rating |
|---|---|---|
| **Hours Worked** [About how many hours per week did/do you work?]<br>Response: open-ended numeric | M: 35.5<br>SD: 12.04 | M: 32.92<br>SD: 13.11 |
| **Job Satisfaction** [How satisfied were/are you with your job?]<br>Response range: -3=Very Unsatisfied to 3= very satisfied | M: 1.97<br>SD: 1.15 | M: 1.59<br>SD: 1.46 |
| **Job Stress** [How stressful was/is your job?]<br>Response range: -3=Not at All Stressful to 3=Very Stressful | M: .27<br>SD: 1.64 | M: .53<br>SD: 1.79 |
| **Job Security** [How concerned were/are you currently about job security?]<br>Response range: -3=Not at All Concerned to 3=Very Concerned | M: -.26<br>SD: 2.13 | M: .34<br>SD: 2.05 |

***Table 4.*** *Respondents' Attitudes Toward Their Work Environment Before and During the Pandemic.*

Even though our respondents held the same job during all of 2020, hours worked per week declined for more than one-third (35.2%); across all respondents, this translated into an average decrease of 2.6 hours per week. Men were significantly more likely to report a decrease in work hours (41.5%) than women (28.5%), $\chi^2(1)=11.6$, $p<.001$, $\varphi=.14$, and people with a bachelor's (39%) or graduate degree (36.8%) were more likely to report decreased hours compared to those with a high school degree and/or technical training (22.9%), $\chi^2(2)=6.68$, $p=.035$, Cramer's V=.10. There were no significant differences in work hours between White and non-White workers.

Looking at job satisfaction, there was an overall trend suggesting job satisfaction decreased between January and November 2020. While the average score remained above the neutral midpoint, suggesting general satisfaction with work, the score decreased by an average of .38 points. One-third (n=217, 33.6%) of respondents reported lower satisfaction in November than January. While there were no differences in job satisfaction based on gender or race, workers who had a bachelor's degree (39.5%) were much more likely to report a decrease in their job satisfaction compared to those with graduate degrees (30.6%) or high school degree/technical training (28.6%), $\chi^2(2)=6.96$, $p=.031$, Cramer's V=.10. We also observed significant variations in job satisfaction across industries respondents worked in, $\chi^2(5)=14.44$, $p=.013$, Cramer's V=.175, with the biggest decrease occurring among those working in health services, where nearly half (48.1%) reported a drop in job satisfaction.

Perceptions of job stress increased between January and November for 37% of respondents. Women (41.6%) were significantly more likely to report an increase in job stress than men (33.2%), $\chi^2(1)=4.77$, $p=.029$, $\varphi=-.086$. In addition, we saw a significant correlation between job stress and workplace location: 30.9% of fully remote workers said their job-related stress increased during this time, compared to 43.1% of hybrid workers and 35.9% of fully on-site workers, $\chi^2(2)=8.02$, $p=.018$, Cramer's V=.11. No differences in job stress were observed when looking at education and race.

Finally, looking at job security, we saw an overall increase in concerns, from below the midpoint (less concerned) in January to above the midpoint in November. Overall concerns about job security increased by .6 points between these two measurements, and nearly 40% of respondents reported higher job security concerns at the end of 2020. Women (44%) were significantly more likely to report higher concerns about their job security compared to men (35.6%), $\chi^2(1)=4.66$, $p=.031$, $\varphi=-.085$. There were no significant differences when looking at increases in job security concerns across education or race.

To summarize findings related to RQ1, multiple characteristics of respondents' working environment were negatively affected during 2020 for a substantial proportion of our sample. These respondents experienced reduced work hours, decreases in job satisfaction, increases in job-related stress, and increased concerns about job security. For two of these factors, women were significantly more likely than men to report a shift toward more negative attitudes or experiences at work.

### *RQ2: Employees' Workplace Monitoring Concerns, During the Pandemic and Beyond*

Workplace monitoring was commonplace among our respondents. As detailed in Table 2, respondents reported their employers used a wide range of technologies to track their interactions, web browsing, time spent working, social media use, and more. Just 12.9% of respondents said their employer did not monitor employees, and 9% were unsure. An interesting pattern emerged in looking at the 12.9% who said there was no monitoring, with a chi-square test revealing a significant difference in responses based on company size: those who worked for companies of less than ten employees accounted for more than half (53.6%) of all "no" responses, $\chi^2(5)=148.53$, $p<.001$, Cramer's V=.503. Small companies may not engage in employee monitoring because of financial costs, technological barriers, or simply because it's a family-run business or the respondent was self-employed.

Among those who selected at least one form of monitoring (n=504), they reported, on average, that their employer used 3.47 of the twelve types of monitoring included in the question ($SD$=2.14). Five types of monitoring were reported by more than one-quarter of respondents: time and attendance (n=396, 61.4%), work email (n=261, 40.5%), physical location (n=212, 32.9%), when they logged into or off the internal network (n=186, 28.8%), and web browsing (n=185, 28.7%). Figure 1 shows a distribution of the number of different types of monitoring tools reported by respondents.

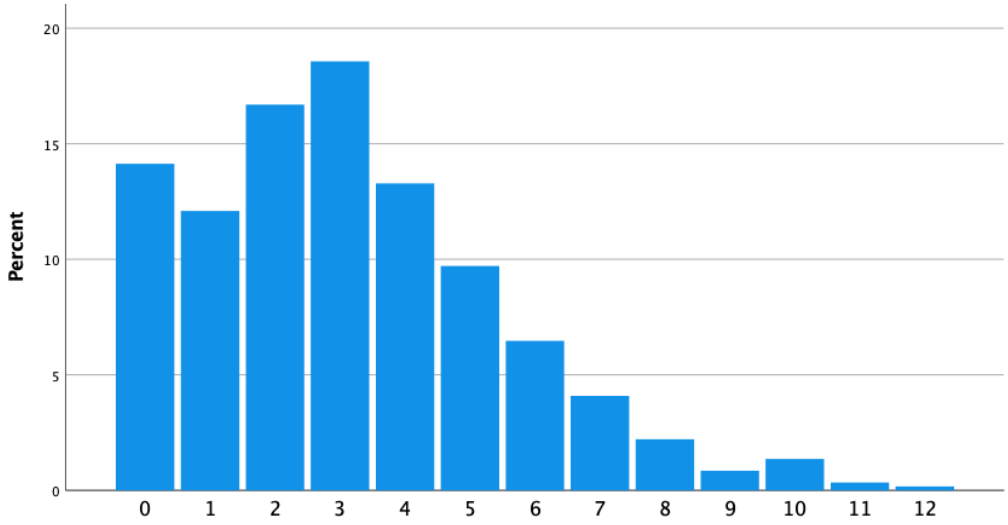


***Figure 1.*** *Number of Monitoring Techniques Used at Respondents' Workplace.*

We asked respondents how confident they were in their knowledge of their employer's monitoring practices at the start of 2020 and at the time of data collection. Overall, confidence dropped by .28 points during the year, from an average score of 1.51 (*SD*=1.3) down to a score of 1.23 (*SD*=1.55), with 32.2% saying their confidence decreased. Looking at this subset of respondents, there were significant variations across industry, with those working in education (45.1%) and health services (42.3%) being more likely to report less confidence in their knowledge of workplace surveillance practices in November 2020, $\chi^2(5)=16.70$, $p=.05$, Cramer's V=.189. In addition, women were significantly more likely than men to report reduced confidence (39.9% vs. 26.2%, respectively), $\chi^2(1)=13.68$, $p<.001$, $\varphi=-.146$.

Next, we asked respondents whether their employer had begun using any new monitoring tools since the start of the pandemic. Men (61.5%) were significantly more likely than women (32.5%) to say their employer had added new monitoring tools, $\chi^2(1)=39.91$, $p<.001$, $\varphi=.285$, as were those with more education, $\chi^2(3)=35.79$, $p<.001$, Cramer's V=.268. We observed a correlation between company size and the addition of new monitoring tools, with those in the smallest companies (1–9 employees) saying this happened rarely (8.9%), while the four largest size options each had greater than 55% of respondents say their employer had added new forms of monitoring, $\chi^2(5)=81.71$, $p<.001$, Cramer's V=.405. Significant differences were also observed based on industry—where those in technology, construction, and manufacturing were most likely to say their employer had added new forms of monitoring—and whether they were working on-site vs. remote in November 2020. In the latter case, remote workers (35.4%) were less likely to say their company added new forms of monitoring than hybrid (54.4%) or fully on-site (60%) workers, $\chi^2(2)=20.06$, $p<.001$, Cramer's V=.201. We saw no significant differences between those who reported additional monitoring and those who did not when looking at changes in job satisfaction, stress, and security concerns since the start of the pandemic.

The most concerning aspect of this question was that nearly one-quarter of respondents (n=147, 22.8%) said they weren't sure if their company had added any new forms of monitoring in response to the pandemic. We explored this more, finding a correlation between company size and the likelihood of saying they weren't sure, with those working for larger companies being much more likely to be unsure than those working at small companies, $\chi^2(10)=120.69$, $p<.001$, Cramer's V=.306. Likewise, we found significant variance when looking across the six most popular industries in our dataset, $\chi^2(10)=53.06$, $p<.001$, Cramer's V=.238. In this case, just 9.5% of construction workers and 12.8% of technology workers said they were

unsure about new forms of worker surveillance. Compare this with workers in education, where more than one-third (34.1%) said they were unsure. Finally, we observed a link between one's knowledge of new monitoring practices and where they worked in November 2020, $\chi^2(4)=39.20$, $p<.001$, Cramer's V=.174. Those working on-site had the least uncertainty about monitoring practices (13.8% reported being unsure), followed by those who split their time between on-site and working remotely (19.5%), and those who were fully remote (32.2%).

We also asked some respondents about their concerns about future workplace monitoring. This question was motivated by work by Ball (2010) and others on function creep, whereby monitoring used for one purpose is expanded to other purposes, or the amount of data collected from employees is expanded after a company discovers it can help increase productivity and reduce "bad" behaviors. Specifically, respondents who said their company had either not begun using new technologies to monitor employees since the start of the pandemic or said they weren't sure (n=397) were asked to indicate their agreement with the statement, "I'm concerned there will be increases in the amount of workplace monitoring post-COVID-19" along a 7-point scale ranging from -3 (Strongly Disagree) to 3 (Strongly Agree). Overall, respondents indicated slight agreement with this statement, although there was significant variance ($M$=.15, $SD$=1.7).

To further explore this question, we constructed an OLS regression model, using this item as the dependent variable and several demographic and workplace items as independent variables, as well as the number of reported current monitoring technologies used at work and their overall concern about data collection. See Table 5 for details.

| **Independent Variable** | **Unstandardized Coefficient (SE)** | **Standardized Coefficient / Beta** | **p-value** |
|---|---|---|---|
| Gender identity: Male | .337 (.173) | .096 | .052 |
| Race: White | -.441 (.229) | -.092 | .055 |
| Age | -.004 (.006) | -.035 | .491 |
| Education | -.173 (.089) | -.093 | .052 |
| Job satisfaction (Nov20) | .039 (.055) | .035 | .484 |
| Job security concerns (Nov20) | .207 (.045) | .240 | <.001 |
| Job stress (Nov20) | .218 (.053) | .226 | <.001 |
| Hours worked per week (Nov20) | -.011 (.007) | -.084 | .097 |
| Number of forms of monitoring used by employer | .151 (.040) | .185 | <.001 |
| Data Collection Concerns Scale | .365 (.079) | .222 | <.001 |
| Constant | -1.22 (.644) | -- | .060 |

***Table 5.*** *OLS Linear Regression Predicting Concerns About Increased Workplace Monitoring Post COVID-19.*

The overall model was significant, $F(10, 325)=14.52$, $p<.001$, adjusted $R^2=.288$, and several IVs were significant predictors. Men ($\beta$=.10, $p$=.052), non-White workers ($\beta$=-.09, $p$=.055), and those with less education ($\beta$=-.09, $p$=.052) expressed greater concerns about post-COVID monitoring at work. In addition,

workers who felt their job was more stressful at the time of data collection ($\beta$=.23, $p$<.001) and had more concerns about their job security ($\beta$=.24, $p$<.001) reported greater concerns about post-COVID monitoring. Finally, we found positive correlations between the number of current monitoring practices used ($\beta$=.19, $p$<.001), as well as general concerns about data collection ($\beta$=.22, $p$<.001), with concerns about increased post-COVID monitoring.

## Discussion

The twenty-first century has been characterized by the rapid development and evolution of new technologies to promote digital communication and collaboration, and these technologies have benefitted organizations and their employees (e.g., Raja et al. 2013; Turner et al. 2010). However, we have also seen a parallel increase in the evolution of surveillance technologies that allow employers to track employees, both when working on-site and when working remotely. In this paper, we considered how the COVID-19 pandemic affected workers' attitudes and experiences, especially as many people who previously worked on-site suddenly became remote workers. We were especially interested in how the pandemic accelerated the adoption of new surveillance tools by employers, workers' attitudes toward these tools, and their concerns about how these tools may be used once the pandemic has ended and many workers return to the office.

We first identified differences in our respondents' attitudes toward their job across three core factors—job satisfaction, job stress, and job security. While this dataset is correlational, we are relatively confident that changes in these factors between January 2020 (2.5 months before the pandemic lockdown began) and November 2020 (when both cases and deaths were steadily increasing, and the US was reporting more than 150,000 daily cases[3]), were due, in part, to the pandemic. A significant percentage of our respondents reported less satisfaction, higher stress, and more concerns about their job security—and these changes were not evenly distributed across workers. More often than not, women reported greater negative shifts during this time, which is perhaps understandable given that women were also taking on more responsibility at home, including childcare and remote learning (Fuhrmans and Weber 2021; Molla 2021).

We also found that work location significantly influenced how participants felt about their job. Historically, research examining telework has shown mixed results, suggesting that some workers benefit from the practice while others suffer from the lack of in-person interaction (e.g., Anderson, Kaplan, and Vega 2015; Baruch 2000; Mann, Varey, and Button 2000). This has been similarly observed during the pandemic (Chiu 2021; Ipsen et al. 2021; Pluut and Wonders 2020; Robison 2020), including a study by Pew Research that found those working from home in the first several months of the pandemic felt they had more flexibility, while those who had to work on-site were concerned about virus exposure (Parker, Horowitz, and Minkin 2020). Alternatively, COVID-19-specific challenges may have made working from home more difficult, notably for parents having to manage work and childcare/remote schooling, workers who were caretakers for other family members, and those whose work suffered from the lack of in-person interactions.

On top of navigating this new reality, concerns about employer monitoring while working at home—and even post-COVID—are creating new uncertainties and stressors. Our respondents' uncertainty about monitoring practices may not be surprising given everything else workers had to manage in the first months of the pandemic, but it is concerning when considered in light of the wider push for worker monitoring and the implications of monitoring workers in a traditionally private space. Scholars have been raising the alarm in recent years regarding increasingly invasive forms of worker monitoring, from productivity software and wearables (Ajunwa 2019) to big data analytics and biometrics (Ajunwa, Crawford, and Schultz 2017), and the pandemic has amplified these concerns due to the increased demand for tools to track employees wherever they are working.

[3] Data pulled from the *Washington Post* (2020) COVID-19 tracker.

Much of the uncertainty—and likely some of the concerns—our respondents expressed about workplace monitoring could be addressed through greater transparency about surveillance and monitoring practices. The lack of transparency, both in terms of surveillance methods used in the workplace and how employers use data collected to make decisions, has been a major focus of workplace surveillance research for more than two decades (Introna 2000). Our data reveal a large percentage of respondents lacked knowledge of their employer's monitoring practices, and the patterns present in the "unsure" responses highlight places where communication about monitoring has been insufficient.

Being aware of workplace surveillance while working at home is necessarily complicated, with the blurred boundaries of remote work making it more difficult to know when and how you're being tracked. Employees may be unaware that their work computer has monitoring tools installed, which is an increasingly common practice. For example, Gartner Research found that the share of large companies using software to collect data like typing frequency, social media posts, and when they log in/off doubled between 2020 and 2021, from 30% to 60% (Hunter 2021). This form of monitoring is largely invisible to workers, especially compared to the more obvious forms of surveillance in physical workspaces (e.g., supervisor walking around, cameras). Beyond that, working from home, especially during the pandemic, has led to a significant blurring of home/work boundaries, and many workers could not fully separate work and non-work hours; this means that workers might be penalized for decreases in productivity—as defined by the software—and that personal data may also be captured by the software in addition to work-specific data (Satariano 2020). This raises significant privacy concerns, and it is often unclear how employers use this data and what, if anything, they are doing to ensure that non-work activities are not stored or used in ways that harm workers.

Based on our findings (e.g., that remote workers expressed significantly higher uncertainty about new monitoring practices) and related work on workplace surveillance, we argue that employers must be more transparent about workplace monitoring for remote workers. Chamorro-Premuzic and Buchband (2020) encourage employers to "remove the element of surprise" and move away from more hidden forms of surveillance meant to catch "bad actors"; these practices are typically not worth the "cost" in job satisfaction, which has been shown to decrease when workers lack trust in their employer (Alder, Noel, and Ambrose 2006). Alder, Noel, and Ambrose (2006) suggest providing employees with advance notice before implementing new monitoring policies or tools and conducting an organizational climate assessment to get feedback from employees regarding new policies. Communication about policy changes should also be provided in multiple formats to ensure the message is both seen and heard, and data should be provided, when possible, to support changes (Kropp 2019).

Transparency by itself may not be sufficient; workers might take issue with over-reaching monitoring practices, regardless of whether they were notified in advance. Consent—which may take a variety of forms in workplace environments and may not be free from undue influence—is also insufficient given the depth and breadth of data collection. In their discussion of the datafication of employment, Adler-Bell and Miller (2018: 2) state that workplace monitoring "opens the door to an extreme informational asymmetry in the workplace that threatens to give employers nearly total control over every aspect of employment." Nguyen (2021: 3) further notes that these practices are largely unregulated in the US, and many workers "do not have a choice, or a voice, about whether they can opt in or out of being monitored."

Moving beyond transparency and consent, employers should focus attention on how and when monitoring practices might be perceived as *inappropriate* and provide their employees with greater control over where, when, and what data are collected about them. As Leonardi (2021) has noted, the pandemic has greatly increased the amount of "digital exhaust" generated by workers—the metadata that reflects how and when employees are working. This digital exhaust is increasingly used to train algorithms that are used in a wide range of employment decisions—even though the accuracy of such algorithms is uncertain (Mateescu and Nguyen 2019)—yet workers are often unaware of the very existence of these data. Given that much of these

data are largely invisible to workers, it raises important questions about consent, appropriateness, and what control workers should have over how such data are used.

Nissenbaum's (2010) theory of privacy as contextual integrity provides a useful framework for evaluating the appropriateness of various workplace surveillance practices. Contextual integrity looks beyond traditional dichotomies that treat data as either private or public. It recognizes that our interactions and data disclosures occur in particular contexts, and that norms around the appropriateness of a particular data flow will vary based on the content of the data, the purpose for which the data are being collected, who is able to access the data, and the guidelines or "transmission principles" in place to shape or constrain disclosures.

In a traditional work environment, the monitoring of employees' performance, behaviors, and even personal characteristics might be considered appropriate, given that context is bounded by the physical limitations of what content can be captured while in the physical workplace and the temporal restrictions on when and how much data are captured from employees while physically present. But in work-from-home environments, where the contexts of the workplace and one's home become blurred, the appropriateness of wide-scale monitoring of all computer activity, environmental conditions, and employee behaviors is debatable. When work and home contexts are merged, employers have an eye into their workers' private spaces and activities. Further, monitoring tools that are deemed appropriate because their primary purpose is to stop the spread of COVID-19 may no longer be deemed appropriate when their use shifts to assessing worker productivity more broadly. Future research should consider how various types of data, purposes, actors, and transmission principles affect the appropriateness of workplace monitoring and workers' perceptions of such practices.

### *Limitations*

As with all point-in-time survey studies, we can only make correlational claims; while it is highly likely the pandemic was responsible for at least some of the findings presented here, we cannot account for other factors that may have affected individual respondents during this time. In addition, our survey design—asking people to recall work conditions and attitudes from ten months earlier—is somewhat limited; however, we think comparing their responses across the two points in time was a useful metric for assessing how the pandemic affected work experiences. Our sampling strategy provided us with a diverse set of US workers, but there were limitations, including some purposeful (i.e., we only surveyed US-based workers who had been able to work from home, which shrank the range of industries included), and some not (i.e., our sample was overwhelmingly White, which prevents us from making meaningful comparisons based on race).

Future research should consider the attitudes and experiences of those who were unable to work from home, as well as those in jobs that already experience significant monitoring, such as those who work in warehouses, gig workers, and retail workers. Such research is needed to better understand how the pandemic may influence future workplace surveillance practices, and whether the power discrepancies observed in normal times will only continue to get worse.

## Conclusion

In this paper, we have explored some of the ways the COVID-19 pandemic has affected workers by asking people who were employed at the same company for all of 2020 how their work experiences changed from the start of the year to its end. We considered both general measures of their work experience (perceived job satisfaction, stress, and security) as well as their experiences with surveillance as part of their job. Findings from this study support popular media articles and anecdotal data that many companies turned to new electronic means of tracking workers as their employees began working from home, although many people in our study were unsure of what these new policies were. Furthermore, many of our respondents

expressed concerns about what workplace monitoring would look like once the pandemic had ended and their working environment returned to "normal."

These findings generate a number of additional questions to explore. Specifically, we think researchers need to consider the interaction between workplace factors and employee monitoring practices. For example, how are workers disempowered by monitoring technologies, and how can employers be more equitable in distributing benefits and harms related to workplace monitoring? Likewise, how are the harms associated with workplace monitoring unevenly distributed? While our findings suggest that men have greater concerns about future surveillance generally, recent research by Stark, Stanhaus, and Anthony (2020) details some reasons why women have greater concerns about camera-based surveillance than men. Likewise, while our ability to detect racial differences in attitudes toward workplace monitoring was hampered by our small non-White sample, significant literature highlights the long history of increased surveillance of Black and Brown people (Browne 2015), and it will be critical to identify whether the pandemic has further exacerbated these discrepancies. Finally, while the pandemic has led to many changes in workplace policies, future work should examine if and how these policies change when workers return to the office, and whether these policies negatively influence job satisfaction, job stress, and collaboration between workers.

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