Two Birds with One Phone: The Role of Mobile Use in the Daily Practices of Remote Information Work

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ABSTRACT

Without the constraints of traditional work environments, information workers can work anywhere, but also any way — interleaving nonwork activities into work hours and vice versa. The mobile provides affordances that support work–nonwork transitions in a way that was not possible from the office. However, it is unclear if and how information workers leverage their mobiles to achieve flexible work practices at home. While uncontrolled flexibility can conflict with productivity, the remote setting suppresses certain explicit opportunities to use a mobile device, e.g. during a commute, due to which people may not be engaging in mobile based flexible work. We aim to describe these mobile use patterns for remote information work to inform better ways to balance work and nonwork needs. We present early evidence from a survey of 118 information workers, a data logging field study of 23 information workers, and follow up data-walkthrough interviews. We found that even though mobiles were used for meetings at home, majority of mobile use was for short nonwork activities. We also found that the mobile can help multitask between work and nonwork roles when remote. At the same time, the mobile supports sedentary digital breaks, despite the flexible nature of information work. These results highlight the role of the mobile device in facilitating a future with flexible work practices to rethink traditional "desk jobs".

CCS CONCEPTS

• **Human-centered computing** → **Empirical studies in ubiquitous and mobile computing**; **Ubiquitous and mobile devices**.

KEYWORDS

Remote Work, Mobile Devices, Multi–tasking, Work–Home Integration

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1 INTRODUCTION

Many organizations are looking towards a future of work where the workforce is hybrid [6, 11]. The COVID-19 pandemic highlighted the effectiveness of remote work and introduced many information workers to a paradigm that saves time, reduces stress, and most importantly gave workers more agency to determine their work practices. However, employers remain anxious about how workers achieve this flexibility [39]. Most importantly, for the worker, remote work introduces novel constraints and disruptions where they must meet the demands of both work and home.

Williams et al., state that worker practices are shaped by, "the belief that work and nonwork are inherently interleaved" [37]. One way to achieve such flexibility is through mobility. At home, information workers have greater freedom to not only move between spaces but also between work and home roles. One ubiquitous technology that provides the affordances to support such transitions is the mobile phone [3, 10]. However, previous investigations of mobile use for work present little empirical evidence on how it is situated in an intermingled work–home setting, such as remote work. The remote setting has limited certain opportunities for mobility (e.g., commute to work), but it has also engendered new ones (e.g., multitasking with home chores) that can change how we view "desk jobs". To design for such remote working experiences, we need to better understand how mobiles complement a worker's ecosystem, especially in a non-workplace setting.

Our study characterizes how mobiles are used in remote information work. Broadly, this study describes mobile usage based on its role (*work* or *nonwork*) and the worker's physical state (*at* or *away* from the workstation). We employed a mixed-methods approach to examine how mobile use manifests during the daily lives of remote workers. Our findings were generated from (i) an online survey of 118 information workers, (ii) a 14–day behavior logging study of 23 information workers, with approximately 1500 application sessions for each participant and a total of 197 responses to daily experience surveys, and (iii) 23 follow-up interviews that involved a data-driven retrospective analysis of individual practices.

This paper describes the initial results from the data we collected. Mobile activities spanned both nonwork and work–related purposes. Nonwork activities were often self–determined, potentially as forms of micro–breaks, and happened mostly when participants were at their workstation and were not deeply focused. In contrast, work–related usage of mobile phones was often triggered by notifications and more likely when workers were away from their workstation. Our findings inform the design of intelligent applications to support the scheduling of micro–breaks and mobile tasks. Together, it can help workers reclaim mobile–friendly periods to pursue activities away from their otherwise sedentary role. A better understanding of mobile use practices helps inform new applications for information workers to meet their work goals without compromising on their personal needs.

2 BACKGROUND

From an organizational perspective, many of the prior studies on information work in remote settings indicate better productivity outcomes despite flexible practices [4]. However, such studies ignore the individual experience needed to meet such outcomes. Mobile devices are considered essential to information work as they help maintain communication and information flows when workers are away from their desk [24, 36]. Earlier, workers were expected to use mobiles when they were not at work, but when is a remote worker *at work*? This paper clarifies mobile use in remote information work by describing both work and nonwork patterns during remote work.

2.1 Work and Nonwork Uses of Mobiles

The turn of the millennium saw mobile use contribute more to a country's growth than personal computers [36]. Originally, work on the mobile was known to be dominated by email communications [19]. Since then, mobiles have become smarter, ubiquitous, and more connected. Recent work in the HCI community has shown the potential of using mobiles for application development [31, 35], debugging of code [18], and for micro-tasks [38]. Yet, mobiles are not only limited to work use. Mobiles play a pivotal role in managing one's personal life as well. These functions go beyond communication and include entertainment, information seeking [23] and task management [37]. Arguably, in information work, these activities can be multiplexed into a single larger device, but studies show that workers employ a mix of strategies to shuffle work and nonwork across multiple devices [15]. Workers can sometimes segment nonwork activities to a dedicated device or in other cases blend work into personal devices (and vice versa). Based on Cecchinato's qualitative case study, in a multi-device environment workers create *micro–boundaries* — such as physically distinguishing devices or temporally allocating a role to a device [7]. Moreover, workers have described that they would reconsider their device–mediated role separations when their work routines became less rigid [9].

In remote work, it is challenging to disentangle work activities from nonwork using traditional methods like time cards [24]. Today, a multi-device ecosystem for a worker can support both roles simultaneously [15]. Understanding the daily practices of mobile use during remote work can help inform new insights and interventions to augment both work and home roles. A study by Karlson et al. from over 10 years ago empirically investigated usage logs to describe various characteristics of interleaving mobile and desktop use [20]. Only 7 of the 16 participants from that study owned touchscreen mobiles. Since then, the functionality of mobiles for both work and nonwork has increased manifold but instrumented studies to unveil such multi–device behaviors have been scarce.

2.2 Factors Associated with Mobile Use at Remote Work

When working remote, information workers often compensate for flexibility by intensifying their work effort [21]. Therefore, mobile use can be sidelined in favor of dedicated PC work when workers are highly engaged. To counteract intense tasks, workers often inject breaks throughout their workday to recover [16, 17]. Unlike the traditional circumstances of information work, while working remotely, workers can take these breaks by accessing resources at their home (e.g., watching TV or gardening). However, the mobile can also be a means to take breaks and can even help assuage loneliness often experienced in remote work [4, 32].

As mentioned earlier, the mobile does have work uses but it is unclear under what circumstances it will be used during remote work. Cao et al. found that during remote work information workers were multitasking for both work and nonwork purposes during meetings, sometimes even physically away from their desk (e.g., exercising or doing chores) [6]. We believe mobiles are fundamental to such multitasking — workers can digitally disengage from work while at the desk, yet stay connected while physically away.

3 DATA & METHODS

3.1 Survey Study

We conducted a survey to learn the perceptions of a large sample of information workers distributed across the globe [1]. We circulated this survey among employees of a large U.S.–based multinational corporation. The survey received 118 responses, of which 27% responses were from workers located outside the U.S., in Europe, Asia, and South America. This survey inquired about worker behaviors for remote work, mobile use, mobile use during work, and mobile use away from the workstation. We also collected demographic information (age, gender, country) and basic personal information (job role). The survey took about 15 minutes to complete. Respondents were not compensated for their participation in the survey.

3.2 Behavior Logging Study

3.2.1 Ethical Considerations. The survey responses motivated us to observe mobile use in-the-wild. To complement survey findings we deployed privacy-preserving logging tools to index actual behaviors and attitudes. This phase of the study was implemented in the same multinational corporation mentioned in Section 3.1. Maintaining participant privacy was critically important to this endeavor. Our instrumentation was designed so that it could not be used for, nor mistaken for, worker surveillance. To this end, a core principle was that raw log data never left participants' devices, and was always under their full control. Data collection, therefore, required participants to explicitly export aggregate reports to the research

[1] The complete survey can be found in the supplementary materials

Table 1: The device use features were computed on the participants' devices before they were provided to the research team

Measure/Label	Description	
Mobile use categories	Each participant labeled application as either Work, Nonwork or Mixed–Use	AWARE+ Participant Label
Mobile use sessions	Every session marks the start time and end time of a foreground application. The actual application name is replaced by the user category	AWARE
Time since latest notification	Time since the application received a new notification after its last session ended	AWARE
Typing duration	Aggregates the time spent typing within an application session	AWARE
PC focus sessions	Start and end time of PC usage. Ends when the PC is turned off or locked.	AWARE+ PC Logging
Ongoing PC activity sessions	The start and end time of the PC activity that was in focus when mobile use occurred. Typically starts before and ends after mobile use.	AWARE+ PC Logging
PC attention	Total time on attention events (typing, clicking, scrolling) in the ongoing activity	PC Logging
PC resumption	Time between the end of mobile use and a new PC attention event	PC Logging
Away from PC	Labeled true when the mobile usage is observed between significant movement — at least 10 seconds of motion before and after with no PC events in between.	AWARE+ PC Logging
Away from Network	Labeled true when the mobile's WiFi network has not been marked for PC work	AWARE+ Participant Label
Calendar event	Categorizes mobile usage based on the coinciding calendar event — free time, meetings, or protected focus time	AWARE PC Logging

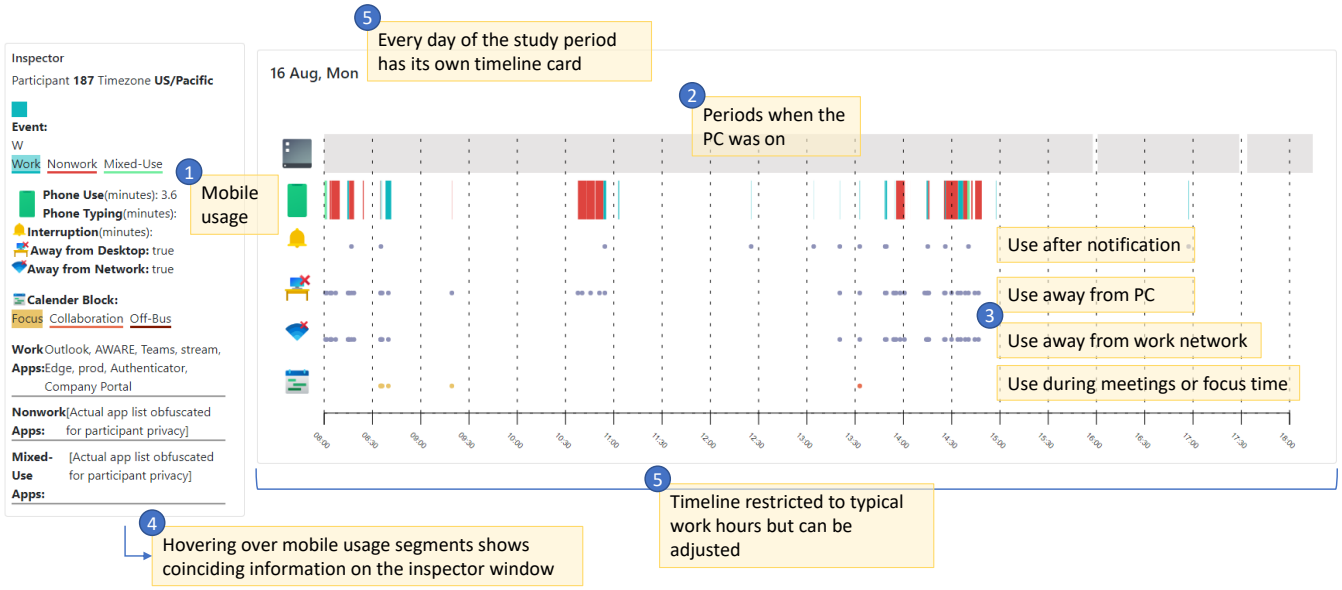

Figure 1: After the participants completed 14 days of data logging we conducted an interview where we presented their mobile use behavior to them (1). Blue, red, and green were used to demarcate work, nonwork, and mixed-use. To assist recall we also showed if their PC was on (2) and annotated other additional context (3) — notification triggered use, if they were away from their workstation/network and if usage was during meetings or focus time. The inspector could summarize the details on the visualization by hovering on a specific event (4). Lastly, we could adjust the period of day shown and the specific days as well.

team after the 7-day and 14-day checkpoints. These reports were generated by a data broker tool that participants used to label and abstract their data. We describe the logging, and the data broker tool, in the next section. This study was approved by an internal Ethics Review Program that supports the corporations' Institutional Review Board (IRB).

3.2.2 Participation & Protocol. We recruited 23 information workers who were working remotely in the U.S. Among them 6 participants identified as women, 16 identified as men, and 1 preferred not to say. 7 started working at a new organization after remote work. Participant roles included analysts, designers, engineers, researchers, scientists, and program or project managers. Recruitment was conducted by advertising the study over organizational email lists. Participants were offered USD 40 for completing 7 days of data collection and an additional $60 for completing all 14 days with

the data-walkthrough interview. For this in-the-wild component, we collected device interaction information by providing participants with logging tools for both their mobile device and their primary computer (PC) for work. For capturing mobile use, we deployed a modified version of the AWARE framework [14], a mobile application for collecting various event–based and continuous contextual signals passively. Our deployment was modified to only store data locally on the participant devices. With this application we were able to log timestamps of certain behaviors: screen events (turning on/off, lock/unlock), foreground applications (name only), notifications, and typing events. We did not collect any content information, such as text on the applications, notification messages, typed characters, or fields. Also, AWARE logged the SSID of the WiFi network the mobile is connected to (every 60 seconds) and also labeled a binary flag for significant motion — 0 if the device stopped moving, 1 if it was moving. For PC activity, we deployed a logging application to record timestamps for application switching events, attention events (typing, scrolling, clicking), and calendar events. We did not collect the on-screen details of the application (e.g., file names), contents of attention events (also excluded objects/fields interacted with). Similarly, for calendar events, we did not collect meeting names or attendees' names. As with mobile logging, all PC logging data was stored locally and did not leave participant devices without explicit interaction. Throughout the logging study, participants responded to various surveys — adapted from prior work — to measure information worker productivity [28], engagement–challenge [27], and anxiety [29]. We retrieved the data from participant devices using a data broker tool that we developed. This broker asked participants to identify mobile applications used for "work", "nonwork", or "mixed use", and only these labels were included in the report. Mixed-use mobile sessions were infrequent and therefore not included in our future analysis. Participants were also asked to identify a "home" WiFi network so that the report could indicate if the person was at "home" or "away" with a Boolean, rather than reporting network SSIDs, or the precise physical location of participants and households. Table 1 shows the main features we extracted from both devices and how they were measured. After their study period was over, we interviewed participants using a visualization dashboard to illustrate participant mobile use throughout different days in the study (Figure 1). The interviewer used the visualization to inspect specific days of participant behavior and help them reconstruct their daily activities. Participants could view the visualization over screen-share and request to view particular instances of mobile use.

4 RESULTS

The following sections describe our key findings. In each section we first describe our quantitative findings from the survey, then the findings from the behavior logging, and lastly situate the results based on a thematic analysis of interview responses.

4.1 Information workers perceived an increase in mobile use during remote work

From the initial survey, we found most information workers perceived an increase in mobile use since transitioning to remote work. 78 respondents (66%) reported increased use during work hours. However, the reported increase was not only for work use, but also nonwork (Figure 2a). Moreover, respondents indicated their mobile was integral to their work practices. 88 respondents (75%) expressed that they were likely to miss their smartphone if it was off–limits during remote work hours. We compared these preferences against other devices and found that smartphones scored higher than tablets and smartwatches (p-value $< 2.2 \times 10^{-16}$), but had no significant difference compared to external displays (p-value$<$ 0.071 using *Dunn's multiple comparison* [13]). Further, we looked into the behavior logs to verify if the perceived prominence of the mobile phone actually manifests in time use. Compared to previously reported measures of information workers [12, 22, 33], the mobile use throughout the day remains similar, but the time during work hours appeared to be greater (Figure 2b). This result validates our motivation to study the unique circumstances of mobile use during remote work.

4.2 Information workers engaged in self-initiated micro-breaks and triggered micro-tasks

The survey responses showed that information workers had a proclivity to nonwork mobile use during remote work. By adapting the *MPAS* [5] questions we found work use affinity (3.2 ± 1.16) to be lower than that for nonwork (3.7 ± 1.06). During the behavior logging, we asked participants to categorize their applications as work or nonwork. Measuring the time use showed that nonwork usage during reported remote work hours captured about 78% of mobile use. While work use was about 15 minutes per day on average, nonwork activities was about 55 minutes per day. In alignment with prior work, we also found that typical mobile activities were short, about 78 seconds (on average). In this section, we present results that indicate how work and nonwork mobile use is related to interruptions (intrinsic or extrinsic) as well as desktop work.

$$Mobile\_State(Non{-}Work) \sim Interruption\_Type(External)+1|Participant \quad (1)$$

4.2.1 ***Work activities were associated with external interruptions and witnessed quicker responses than nonwork.*** From the device logging, we were able to determine if a mobile application was initiated by a notification or not. Depending on how the participant categorized their applications, we could discern if the notification was related to work or nonwork. To disentangle the relationship between purpose of mobile use and how it was initiated, we built a Generalized Linear Mixed-effect Model (GLMM) with a binomial distribution. The type of interruption was a fixed effect and the participants were included as random effects. The reference levels are provided in the parentheses of Equation 1. We found a significant main effect between interruption type and what the mobile was used for. Self-interruptions were negatively associated with work related phone use, and vice-versa (Table 2). Notifications preceded 27% of work sessions but only 13% of nonwork (Table 2). Based on the *Kruskal-Wallis* test, we found that workers took significantly longer to respond to nonwork notifications compared to work (p-value= 5.6×10^{-9}). During work hours, the median response time for work notifications was 97 seconds. By contrast, the median response for nonwork notifications was

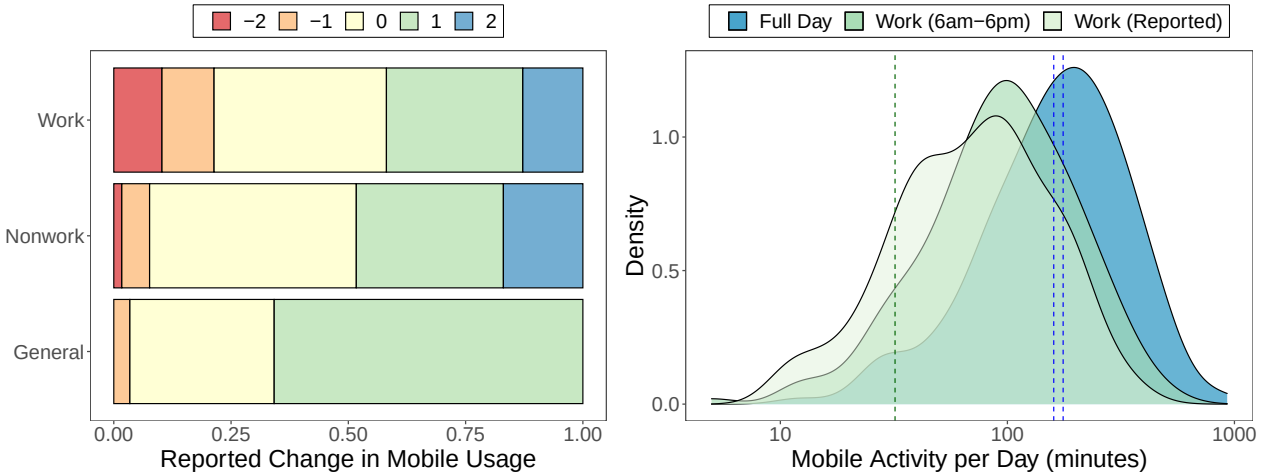

Figure 2: Information workers believed that their mobile use during work hours had increased. Time use measures quantified this increase. (a) Most survey respondents reported an increase in use — -2 = *Much less often*, -1 = *Less often*, 0 = *As Often*, 1 = *More Often*, 2 = *Much more often*. (b) Measuring the duration of mobile use was found to be comparable to full–day use in previous studies (dashed blue lines [22, 33]). However, the usage during work had increased in comparison to prior work (solid green line [12]).

Table 2: The table shows the results of a GLMM with random effects to study the relationship between interruption type and mobile sessions. In comparison to external interruptions, self-interruption had 0.42 lower log-odds ratio that the session was work related. However, the random effects indicate that this fixed effect is expected to vary between participants.

Fixed Effect	Estimate	*p*-value
Intercept	-1.22	1.1×10^{-6}
Self Interruptions	-0.42	7.5×10^{-8}

Random Effect	Variance
Participant	1.29

170 seconds. Therefore, we observed participants show some form of prioritization between work and nonwork, even though they can flexibly interleave either. In general, these results provide empirical evidence that even in remote work the mobile device supports immediate awareness of work processes. At the same time, it also affords self–determined nonwork uses.

4.2.2 ***Workers took longer to resume PC work after external interruptions and after nonwork interruptions.*** Given that the mobile is not an information worker's primary work device, we were curious to see how it interrupts desktop activities. Particularly, to evaluate how disruptive mobile use can be, we inspected the time it took participants to resume desktop activities after mobile use. We measured the time it took for a new attention event on the desktop after a mobile application ended. On average, participants resumed desktop activities after 84 seconds. On closer look, the resumption time for external interruptions were significantly longer than self–interruptions (p-value= 5.2×10^{-9}). Moreover, participants took significantly longer (p-value= 6.1×10^{-7}) to resume work after nonwork mobile activities (92 seconds) than after work mobile activities (60 seconds). The observably faster resumption times for work–related mobile use could reflect activities on both devices that are connected by a larger process — or *working sphere* [26].

In the follow-up, participants revealed that nonwork mobile use was a means to self-stimulate (Figure 3). Participants took quick breaks from their remote work routine using communication applications, social media and games.

> *On Fridays I'm doing focus work, and sometimes, it's not a great habit, but if I'm in the middle of a long focus time, then I want a brain break. I'll pick up my phone and look up my personal email and things like that. (P104)*

Although all interruptions have a cost, a longer resumption time could also indicate upcoming work tasks that are not as urgent. The nonwork mobile use might not be disruptive, it might occur during opportunities that allow easy context switches in the first place. Essentially, we found that while some participants viewed these interruptions as disruptions, others actually embraced it as a part of their remote work routine.

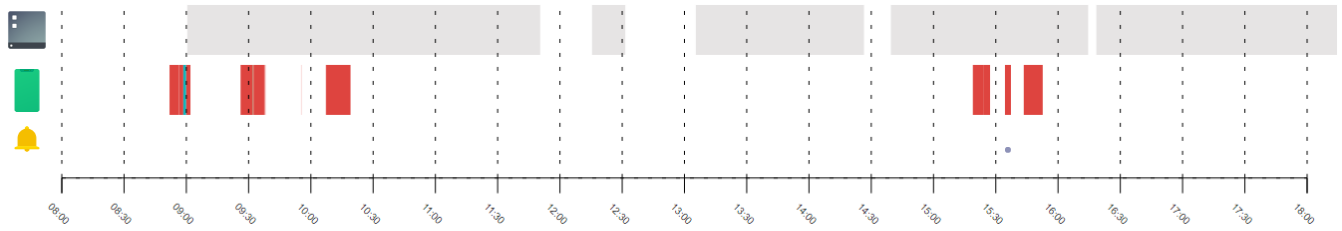

Figure 3: On August 9, 2021, we observed P374 engaging in micro–breaks during remote work. Most of these nonwork activities are self–initiated (now dot on the notification row).

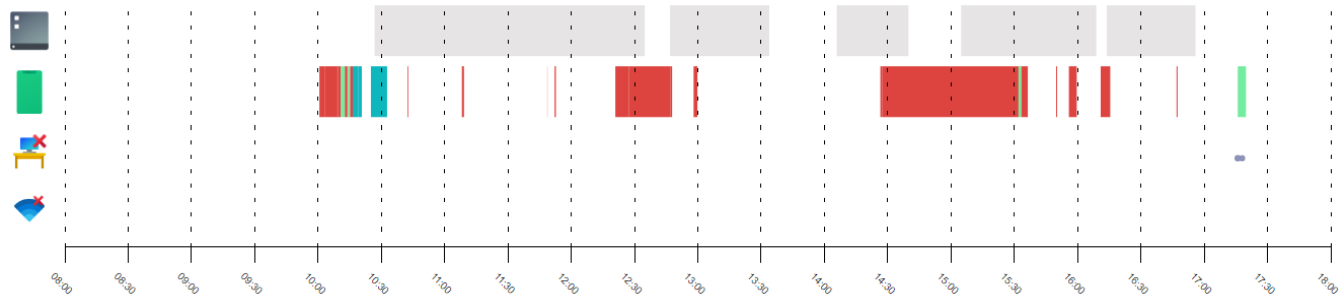

Figure 4: On that day P594 did not appear to use their mobile when away from their PC (even when it was off—gaps in the top row). Instead, we see them fill gaps in work with nonwork usage (that begins when the PC is active).

4.3 Mobiles support work when away from the workstation and support nonwork when disengaged at the workstation

Given the nature of mobile use patterns, the application sessions on the mobile device were short enough to be interleaved with any PC work activity. Our survey asked workers to report the frequency of their mobile device use, (i) when simultaneously present at their workstation, and (ii) when taking a break away from it. 78% of the respondents reported to use their mobile for work at least occasionally when away from their desk such as during coffee breaks (64%) and while cooking meals (67%). Motivated by these responses, we analyzed the behavioral logs to highlight the mobile use in the context of doing desk work.

Our participants' workstations were laptops (PC) that were typically connected to external monitors. To infer if a worker was away from their workstation, we combined various behavioral features — (i) when we detected mobile use after the worker had moved away from their PC and no PC events, or (ii) the mobile was away from their work networks (Table 1). As per this method, a worker is still considered near their workstation if they move their laptop away from the desk and keep working. During reported work hours, we found 76% of time use and 79% of application sessions occurred when the workers were detected away from their workstation. Therefore, mobile use was indeed *mobile*. We dissected the association between purpose of mobile use and workstation presence, by building another Generalized Linear Mixed effect model with a binomial distribution. The proximity to workstation was a fixed effect and the participants were included as random effects. The reference levels are provided in the parentheses in Equation 2. We found a significant main effect between workstation proximity and type of mobile use. When workers were near their workstations they were less likely to use their mobile for work tasks, and vice-versa (Table 3).

Table 3: The table shows the results of a GLMM with random effects to study the relationship between proximity to workstation and mobile sessions. In comparison to being away from the workstation, being near it had -1.07 lower log-odds ratio that the mobile session would be work related. However, the random effects indicate that this fixed effect is expected to vary between participants.

Fixed Effect	Estimate	*p*-value
Intercept	−1.52	4.5×10^{-10}
Near Workstation	−1.07	4.3×10^{-5}

Random Effect	Variance
Participant	1.31

$$Mobile\_State(Non{-}Work) \sim Workstation\_Proximity(Away){+}1|Participant \quad (2)$$

The data-walkthrough with the participants helped us interpret situations where we saw chunks of nonwork mobile use in parallel to PC use. Participants described that their workday often has periods of downtime or dead-time. Since these periods only need passive awareness of work, instead of "babysitting" *(P833)* the operations, participants would use their mobile to engage nonwork activities (Figure 4). These events were likely to occur when participants were being "blocked" on work tasks *(P793)*, anticipating a work process to complete *(P374)*, or waiting for an event *(P658)*.

> *"I refer to them in my head as garbage hours because it's 30 minutes or so between my meetings. Where you have one meeting and then you have another coming up and it's not enough to start some focused work" (P594)*

Fundamentally, this finding captures how work intensity throughout the day can be fragmented and nonwork activities on the mobile helps workers transition between those periods.

5 DISCUSSION

5.1 Opportunities to Support Flexibility at Remote Work

Literature on moderating ICT use has mostly focused on designing digital self–control tools [30] that encourage users to reduce time spent on specific applications. However, when workers have flexible work practices they are not incentivized to spend additional time on work *(P793)*. And restricting use will only lead workers to find new ways to compensate *(P187, P672)*. Therefore, instead of simply suggesting restricted mobile use, we use our findings to discuss how nonwork mobile activities can be used to improve remote work.

In a traditional workspace, walking between meetings or turning around and talking to the desk neighbour were forms of achieving breaks *(P374)*. Using the mobile to transition role-boundaries is easy and can be meaningful for respite [34]. These micro–breaks could be recommended to workers by modelling user attention, work intensity, and work schedules. The behavior logging study showed us that nonwork mobile use was highly associated with simultaneously being at the workstation. In theory, information workers should be able to break free from their usual sedentary behavior if they are on their mobile. Therefore, by identifying such moments it is worth exploring if workers can be nudged to be physically mobile or even attend to offline micro–tasks at home.

5.2 Societal Implications

In this study we employed device logging that is far beyond the scope of traditional employers [25]. Indeed, as more activities are mediated by technology, and as we bring more workplace devices into our private homes, such logging may yield a panoptic view of workers' lives. It is therefore no surprise that remote work has only exacerbated concerns with workplace surveillance [1]. To reconcile the benefits and risks of such passive sensing for work we will need to combine technological and policy approaches. These approaches need to focus on protecting workers with sensitivity towards the workplace power dynamics. Advancement in this space is critical for this research to move forward. From a technology point-of-view the insights from such tools should be targeted to the data owner, the worker. Workers should be clearly notified why different data is captured before they decide to opt–in. Moreover, surveillance of different types of data vary in reasonableness and intrusiveness [8]. Therefore, workers must have the agency to determine what data contributes to aggregate statistics for an employer. At the policy front, we need to evaluate these solutions in light of the power dynamics at play between employees and employers [2] — what pressures will employees feel when making such decisions? Here, policies such as Europe's General Data Protection Regulation (GDPR) already protect some classes of employee–employer data. Such regulations may provide necessary external pressures to limit the scope of data collection, and tip the balance to a more equitable position.

5.3 Limitations and Future Work

An organic way to improve on our work is to study device activity with more granularity. However, such attempts should consider a privacy-centered study design. Another factor influencing our findings is when the study was conducted in reference to the organizational lifecycle. Given our study period was only 2-weeks we could not capture any major seasonal changes. We believe multiple device usage is likely to change when workers are busier, say at the end of a quarter. Also, this work is only focused on information work. Future work can study the role of the mobile in other job roles, cultures, and communities.

6 CONCLUSION

The flexibility enjoyed by information workers in remote settings helps mesh their work and nonwork activities. One device that can facilitate such interleaving for an information worker is their mobile device. However, we have a limited understanding of how within-day mobile use practices manifest in remote work and if they help or harm worker experiences. This paper discusses an initial investigation that situates work and nonwork uses of the mobile into the multitasking nature of remote work. We hope to encourage new ways to support worker productivity, recovery and multitasking at remote work.

REFERENCES

[1] Bobby Allen. 2020. Your Boss Is Watching You: Work-From-Home Boom Leads To More Surveillance. *https://www.npr.org/2020/05/13/854014403/your-boss-is-watching-you-work-from-home-boom-leads-to-more-surveillance* (2020).

[2] Kirstie Ball. 2010. Workplace surveillance: An overview. *Labor History* 51, 1 (2010), 87–106.

[3] Larissa K Barber and Alecia M Santuzzi. 2015. Please respond ASAP: workplace telepressure and employee recovery. *Journal of Occupational Health Psychology* 20, 2 (2015), 172.

[4] Nicholas Bloom, James Liang, John Roberts, and Zhichun Jenny Ying. 2015. Does working from home work? Evidence from a Chinese experiment. *The Quarterly Journal of Economics* 130, 1 (2015), 165–218.

[5] Beth C Bock, Ryan Lantini, Herpreet Thind, Kristen Walaska, Rochelle K Rosen, Joseph L Fava, Nancy P Barnett, and Lori AJ Scott-Sheldon. 2016. The mobile phone affinity scale: enhancement and refinement. *JMIR mHealth and uHealth* 4, 4 (2016), e6705.

[6] Hancheng Cao, Chia-Jung Lee, Shamsi Iqbal, Mary Czerwinski, Priscilla NY Wong, Sean Rintel, Brent Hecht, Jaime Teevan, and Longqi Yang. 2021. Large scale analysis of multitasking behavior during remote meetings. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*. 1–13.

[7] Marta E Cecchinato. 2018. *Communicating in a multi-role, multi-device, multi-channel world: how knowledge workers manage work-home boundaries.* Ph.D. Dissertation. UCL (University College London).

[8] Étienne Charbonneau and Carey Doberstein. 2020. An empirical assessment of the intrusiveness and reasonableness of emerging work surveillance technologies in the public sector. *Public Administration Review* 80, 5 (2020), 780–791.

[9] Luigina Ciolfi and Eleanor Lockley. 2018. From Work to Life and back again: Examining the digitally-mediated work/life practices of a group of knowledge workers. *Computer Supported Cooperative Work (CSCW)* 27, 3 (2018), 803–839.

[10] Karlene Cousins and Daniel Robey. 2015. Managing work-life boundaries with mobile technologies: An interpretive study of mobile work practices. *Information Technology & People* (2015).

[11] Maitraye Das, John Tang, Kathryn E Ringland, and Anne Marie Piper. 2021. Towards Accessible Remote Work: Understanding Work-from-Home Practices of Neurodivergent Professionals. *Proceedings of the ACM on Human-Computer Interaction* 5, CSCW1 (2021), 1–30.

[12] Vedant Das Swain, Koustuv Saha, Hemang Rajvanshy, Anusha Sirigiri, Julie M Gregg, Suwen Lin, Gonzalo J Martinez, Stephen M Mattingly, Shayan Mirjafari, Raghu Mulukutla, et al. 2019. A multisensor person-centered approach to understand the role of daily activities in job performance with organizational personas. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies* 3, 4 (2019), 1–27.

[13] Olive Jean Dunn. 1964. Multiple comparisons using rank sums. *Technometrics* 6, 3 (1964), 241–252.

[14] Denzil Ferreira, Vassilis Kostakos, and Anind K Dey. 2015. AWARE: mobile context instrumentation framework. *Frontiers in ICT* 2 (2015), 6.

[15] Rowanne Fleck, Anna L Cox, and Rosalyn AV Robison. 2015. Balancing boundaries: Using multiple devices to manage work-life balance. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*. 3985–3988.

[16] Charlotte Fritz, Allison M Ellis, Caitlin A Demsky, Bing C Lin, and Frankie Guros. 2013. Embracing work breaks. *Organizational Dynamics* 42, 4 (2013), 274–280.

[17] Lynette Harris. 2003. Home-based teleworking and the employment relationship: Managerial challenges and dilemmas. *Personnel review* (2003).

[18] Maria Husmann, Alfonso Murolo, Nicolas Kick, Linda Di Geronimo, and Moira C Norrie. 2018. Supporting out of office software development using personal devices. In *Proceedings of the 20th International Conference on Human-Computer Interaction with Mobile Devices and Services*. 1–11.

[19] Amy K Karlson, Shamsi T Iqbal, Brian Meyers, Gonzalo Ramos, Kathy Lee, and John C Tang. 2010. Mobile taskflow in context: a screenshot study of smartphone usage. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. 2009–2018.

[20] Amy K Karlson, Brian R Meyers, Andy Jacobs, Paul Johns, and Shaun K Kane. 2009. Working overtime: Patterns of smartphone and PC usage in the day of an information worker. In *International Conference on Pervasive Computing*. Springer, 398–405.

[21] Clare Kelliher and Deirdre Anderson. 2010. Doing more with less? Flexible working practices and the intensification of work. *Human relations* 63, 1 (2010), 83–106.

[22] Karina Loid, Karin Täht, and Dmitri Rozgonjuk. 2020. Do pop-up notifications regarding smartphone use decrease screen time, phone checking behavior, and self-reported problematic smartphone use? Evidence from a two-month experimental study. *Computers in Human Behavior* 102 (2020), 22–30.

[23] Kai Lukoff, Cissy Yu, Julie Kientz, and Alexis Hiniker. 2018. What makes smartphone use meaningful or meaningless? *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies* 2, 1 (2018), 1–26.

[24] Mika Maliranta and Petri Rouvinen. 2006. Informational mobility and productivity: Finnish evidence. *Econ. Innov. New Techn.* 15, 6 (2006), 605–616.

[25] Ivan Manokha. 2020. The Implications of Digital Employee Monitoring and People Analytics for Power Relations in the Workplace. *Surveillance & Society* 18, 4 (2020), 540–554.

[26] Gloria Mark, Victor M Gonzalez, and Justin Harris. 2005. No task left behind? Examining the nature of fragmented work. In *Proceedings of the SIGCHI conference on Human factors in computing systems*. 321–330.

[27] Gloria Mark, Shamsi T Iqbal, Mary Czerwinski, and Paul Johns. 2014. Bored mondays and focused afternoons: the rhythm of attention and online activity in the workplace. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. 3025–3034.

[28] Gloria Mark, Shamsi T Iqbal, Mary Czerwinski, Paul Johns, Akane Sano, and Yuliya Lutchyn. 2016. Email duration, batching and self-interruption: Patterns of email use on productivity and stress. In *Proceedings of the 2016 CHI conference on human factors in computing systems*. 1717–1728.

[29] Theresa M Marteau and Hilary Bekker. 1992. The development of a six-item short-form of the state scale of the Spielberger State—Trait Anxiety Inventory (STAI). *British journal of clinical Psychology* 31, 3 (1992), 301–306.

[30] Alberto Monge Roffarello and Luigi De Russis. 2021. Coping with Digital Wellbeing in a Multi-Device World. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*. 1–14.

[31] Tuan Anh Nguyen, Christoph Csallner, and Nikolai Tillmann. 2013. GROPG: A graphical on-phone debugger. In *2013 35th International Conference on Software Engineering (ICSE)*. IEEE, 1189–1192.

[32] World Health Organization et al. 2020. *Mental health and psychosocial considerations during the COVID-19 outbreak, 18 March 2020*. Technical Report. World Health Organization.

[33] Antti Oulasvirta, Tye Rattenbury, Lingyi Ma, and Eeva Raita. 2012. Habits make smartphone use more pervasive. *Personal and Ubiquitous computing* 16, 1 (2012), 105–114.

[34] Anya Skatova, Ben Bedwell, Victoria Shipp, Yitong Huang, Alexandra Young, Tom Rodden, and Emma Bertenshaw. 2016. The role of ICT in office work breaks. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*. 3049–3060.

[35] Nikolai Tillmann, Michal Moskal, Jonathan De Halleux, and Manuel Fahndrich. 2011. Touchdevelop: Programming cloud-connected mobile devices via touchscreen. In *Proceedings of the 10th SIGPLAN symposium on New ideas, new paradigms, and reflections on programming and software*. 49–60.

[36] Khuong M Vu. 2011. ICT as a source of economic growth in the information age: Empirical evidence from the 1996–2005 period. *Telecommunications Policy* 35, 4 (2011), 357–372.

[37] Alex C Williams, Shamsi Iqbal, Julia Kiseleva, and Ryen W White. 2020. Managing Tasks Across the Work-Life Boundary: Opportunities, Challenges, and Directions. (2020).

[38] Alex C Williams, Harmanpreet Kaur, Shamsi Iqbal, Ryen W White, Jaime Teevan, and Adam Fourney. 2019. Mercury: Empowering Programmers' Mobile Work Practices with Microproductivity. In *Proceedings of the 32nd Annual ACM Symposium on User Interface Software and Technology*. 81–94.

[39] Ed Zitron. 2021. Why Managers Fear a Remote-Work Future. https://www.theatlantic.com/ideas/archive/2021/07/work-from-home-benefits/619597/