Introduction to this special issue: the future of remote work: responses to the pandemic

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Introduction to this special issue: the future of remote work: responses to the pandemic

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The coronavirus pandemic has significantly disrupted information work across the globe. Since March 2020 when the World Health Organization designated Covid-19 as a pandemic, workplaces across the globe have had to make swift changes for their employees to work remotely. The rapid and prolonged shift to remote work from home is producing transformational change that will undoubtedly have long-term implications. The new reality of distributed information work simultaneously challenges and inspires us to revolutionize our work practices and technologies to support the sustainable and robust distribution of people, resources, and knowledge.

For most information workers, working from home is a new experience. In December 2020, less than one year after the shift to work-from-home for most companies, a national survey in the US found that only 20% of information workers had such prior experience (Parker et al., 2020) and in the UK only 6% of workers (ONS (Office for National Statistics), 2020). With the pandemic lockdown, organizations and schools had to be agile and develop strategies for people to make a rapid switch of contexts from the office to the home. However, these changes may be long-lasting. Experts predict that this will not be our last pandemic, and as we have seen over the last two years, new variants of the virus keep emerging. Experts also predict that Covid-19 will likely become endemic (Phillips, 2021) which means that we will have to adjust our lives around this condition. Furthermore, workers and firms alike have accrued valuable, and often positive, experiences with working from home, which makes the continuation of these arrangements likely: a survey of over 30,000 Americans revealed that 20% of workdays will likely remain remote even after the pandemic (Barrero et al., 2021). Futurists also predict that new forms of work such as hybrid work or working in new contexts will continue to develop (Davis et al., 2020).

The field of HCI is well positioned to study this phenomenon due to its interdisciplinarity, encompassing varied perspectives from psychology, anthropology, organizational behavior, design, technology, and more. Over the last two decades, through its interdisciplinary lens, research in HCI and CSCW has uncovered factors that contribute to successes and failures of teams who work in distributed settings. For example, in their seminal paper *Distance Matters*, published in this journal over twenty years ago, Olson and Olson identified four such factors: teams that have developed common ground, that have a mind-set for collaboration readiness and collaboration technology readiness, and who work loosely-coupled, have a greater chance of working effectively in a distributed setting (Olson & Olson, 2000). Twenty years later, we are now facing a new type of remote work-from-home configuration where issues such as managing work-home life boundaries are prominent (De Bloom, 2020; Schieman et al., 2021). Social interaction has also changed; whereas in the workplace people could spontaneously meet others, socialize, and share information, the work-from-home setting has created an atmosphere where such synchronous informal social

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interactions are rare. And when such infrequent informal interactions do occur, they have to fit in around formal meetings or else be planned in advance.

The goal of this special issue on The New Future of Work is to provide a forum to explore where we have come from and to suggest future directions if we are to meet these challenges. This issue showcases timely and novel research on currently disrupted or evolving work practices that can enable us to reflect on how past findings shed light on our current situation, to help us prepare for a world in which work may be done very differently.

The idea for this special issue began as the vision for The New Future of Work Symposium started to crystallize. The organizers of this Symposium felt that there was a pressing need, given the rising tide of the pandemic, for the research community to come together and address the challenges that workers were facing. This Symposium was held in August 2020, with 245 attendees, representing researchers and practitioners from industry, academia, and government, all working in interdisciplinary fields. Participants convened together for three days of keynotes, talks, and productive conversations. The discussions were exciting, ranging from presenting new designs for technology to support team awareness, introducing ways to increase motivation and productivity in a work-from-home context, and introducing novel interventions to preserve team identity in remote work environments. These conversations were provocative and raised significant questions, as well as providing pathways to solutions.

Challenges faced in a remote work context are not just related to work, but given our new workspaces, schedules, and configurations, they are also related to personal and family life as well. Further, there are challenges related to enhancing productivity while importantly preserving well-being. The relative unfamiliarity with remote work for most people prior to the pandemic along with the speed of the workstyle change has also led to difficulties in adaptation. To address these challenges we need to think about understanding and designing new paradigms for interaction, creating new tools, and above all, forging new directions for a future of work that is likely here to stay. The papers in this special issue present empirical research and novel concepts that we can explore in considering how remote work and other emerging work forms in our new age can be sustainable.

1. Challenges of working in a remote context

The papers in this special issue are a good representation of the challenges of working in a remote context. The selected papers cover three basic themes: technology use, attitudes and adaptation to remote work, and changes in work practice as a result of the switch to working remotely.

1.1. *Technology use*

Research in HCI has long realized the central role that technology plays in supporting remote meetings. In the new work-from-home context we are seeing traditional technologies being deployed to support interaction such as audio conferencing and e-mail. We are also seeing greater use of technologies such as video-conferencing as well as VR, that were less used in the past. Three papers have addressed this theme.

Bleakley, Rough, Edwards, Doyle, Dumbleton, Clark, Rintel, Wade, and Cowan continue a long line of research in CSCW/HCI on the role of informal social conversation at work, starting with the work of Kraut et al. (1990) who observed its importance in fostering collaboration. In our new future of work, workers are reconstructing certain aspects of their workspace that play an essential role in information sharing and well-being, and these include developing structures for informal interaction. The authors examine a new type of water cooler conversation that is emerging through video conferencing: social talk among remote workers, a topic that has not been previously examined. Whereas technologies like video reduce physical barriers to meeting remotely, on the other hand, people now have to explicitly schedule times to meet. In an irony of our new times, informal social

communication now has to be formally organized, even with the use of calendars, since remote workers lack opportunities to spontaneously encounter colleagues. Activities such as coffee breaks, lunch, or even games have become part of these online social encounters. The authors found that some of the same problems occur with informal video communication as with informal in-person conversations, such as awkward turn-taking. Problems also surface, such as interruptions, due for example, to latency in the video or to limited visual cues. This paper points to the challenge of supporting social bonding and relationships to develop common ground in our new remote work settings. The authors suggest redesigning video conferencing in order to support more seamless informal social interactions. For example, linking tools across communication platforms could support the planning and coordination of social talk. Also, team members with higher status are often the organizers of social talk; using bots as facilitators could circumvent status and encourage more social interactions.

VR is coming into prominence as a tool that can support remote meetings yet it is recognized that there are still some limitations compared to video conferencing which can display natural facial expressions in real time. However, VR systems provide other features that can benefit interaction such as a heightened sense of presence. In the paper by **McVeigh-Schultz and Isbister**, the authors explore how VR can offer new opportunities for social interaction beyond just what they refer to as "being there." Reframing the design problem from interventions for enhancing individual experiences to interventions for enhancing shared social experiences, the authors examine social affordances in VR systems as applied to interacting partners. They argue that affect and affinity are key social aspects in interaction that should be designed into VR meeting systems. They raise a number of design questions such as what form cues should take to promote these aspects and whether cues should be ephemeral, changing with context, or enduring throughout the meeting. The authors illustrate their *Research through Design* approach in a case study of two design prototypes evaluated in a laboratory task. The case study led to a number of questions about social affordances such as which affordances are most beneficial and how do they work in practice? A broad question the authors raise is whether such affordances should be modeled after real-world interaction or whether completely new forms of social affordances should be designed, especially because VR systems have the capability to support novel interaction forms. This paper presents provocative questions of how design might trigger new practices of interaction, not used with interaction in traditional systems. How will people adapt?

The common use of video-conferencing in remote work during the pandemic has naturally raised questions about people's self-presentation over video. Whereas compared to face-to-face interaction, the use of video offers people more of an opportunity to present a positive self-image, **Taber, Dominguez, and Whittaker** examined whether this is still the case in the new context of working-from-home. In a work-from-home setting, it is hard to avoid context-collapse, to retain the differentiation of contexts, as one may have difficulty in switching from a colleague role to a parent role while working in the home with children around. Another stark difference is a shift in one's video audience. Whereas before the pandemic people generally interacted over video with trusted individuals, i.e. family or friends, once the pandemic began, people were often thrust into meetings with anonymous others, sometimes with large audiences. The authors had a unique opportunity to study self-presentation over video pre and post-pandemic. Despite the radical shift to working from home when the pandemic began, the authors still found a positivity bias in self-presentation with video as they did pre-pandemic. Personality measures also showed some changes, for example, people were more extroverted in video interactions pre-pandemic, likely due to being in settings with familiar people. In comparing office workers with students, Taber et al report that the former were keenly aware of how important it was to manage physical space, and limit intrusions of family life so that they appeared more professional. The results of this study challenge popular narratives about the negative experiences of video conferencing, instead showing evidence for positive experiences. The authors suggest that future video conferencing systems should enable users to have more control over the images they project, as ultimately this can lead to more positive

self-presentation and more positive experiences. However, an interesting question raised is that given that we are expected to work remotely long term, perhaps projecting a continuous positive self over video may not be optimal in all situations.

1.2. *Attitudes and adaptation to remote work*

Attitudes toward remote work are key to success and failure. Because remote work was unfamiliar to most workers at the time of the lockdown and with the consequent rapid change, people had to adapt to new work practices, communication and coordination styles. They also had to adopt new tools, take on family responsibilities during work time, and more. The adaptation to this new work form varied among people. This set of papers examines how some people were able to adapt well while others not. The type of mind-set or attitude one has, and the ability to face the change and uproot the past helped explain who was able to adapt or not.

Attitudes toward collaboration in remote work can promote success or failure at it, as the paper *Distance Matters* reported (Olson & Olson, 2000). The paper by **Howe and Menges** examines how basic beliefs, or mind-sets, can affect the transition from in-person to remote work settings. With a fixed mind-set, people's beliefs are set in stone, i.e. they believe they are inherently good at remote work or not. With a growth mind-set, people's beliefs can be changed, and they believe that remote work is a skill that can be developed. The authors found that a person's mind-set predicts their well-being during the pandemic. This Swiss study was conducted in April 2020, soon after companies switched to remote work. Mind-Sets were measured through a survey at the start of the study, and then emotion and productivity were measured over the next four weeks in weekly surveys, enabling the researchers to track a change in emotion during the transition. Those with fixed mind-sets reported feeling significantly less positive emotion over this four-week transition period to remote work. Fixed mind-sets, which were also associated with more negative emotions, also predicted lower productivity. This study is unique in identifying individual differences that exist in relation to adjusting to remote work and raises an important issue of how attitudes can influence one's ability to change and adapt. It also calls for organizations to develop strategies that can help people with fixed mind-sets to become more adaptive to new work environments. This paper highlights how we cannot expect that all workers can adapt well to radical changes.

Working remotely has become a new normal, either in temporary form, or likely in the future in more permanent form, at least for part of the work week. In order to understand the experiences of remote workers, most of whom were facing remote work for the first time, **Newbold, Rudnicka, Cook, Cecchinato, Gould, and Cox** investigated the challenges, strategies and solutions that people used during adaptation. They applied the model of Genuis and Bronstein for seeking a new normal in the health domain. As many of us who have been working from home since the lockdown began know well now, seeking a new normal is difficult. There are physical, social and emotional issues to address. Physical issues include configuring a physical workspace at home, ergonomics, internet bandwidth, and lack of office equipment. Social issues include shuffling between work and family life, a shift which became more prevalent in working from home. Interruptions, experienced previously at the office, were now more common, and came from different sources, such as family, or seeing chores that needed to be done. Whereas ad hoc communication could easily solve a problem prior to the pandemic, now workers had to spend time tracking down others online who could help. But what was also interesting is that previous events that set work boundaries for the day, such as commuting, no longer existed, leaving workers the need to define new boundaries and develop new work patterns. Workers who faced the most challenges were those who, due to lack of physical space to create a separate, dedicated workspace, were only able to create boundaries between work and homelife in digital form. Some people circumvented such obstacles by creating flexible schedules for work time. Individuals adopted more and different types of tools, organizations organized social events, and found ways to stay connected with colleagues, such as with asynchronous systems. One of the most important findings in this paper is that through the lens of

Genuis and Bronstein's model, some people persisted in the old "normal" awaiting a return to a familiar workstyle while others were able to move on, adjust, and forge a new normal for themselves. The authors discuss the importance of resilience and how people have found ways to create a new normal to adapt to crises.

1.3. *Changes in work practices*

The change in work location put a new spotlight on work practices. In working from home, people no longer commute, which frees up time for other activities. On the other hand, while people have always integrated work and personal life, in an at-home context, the boundaries are more blurred, which has led to new ways in structuring the day. Further, new social practices of social distancing have been introduced in order to curtail the pandemic, and for some professions in which face-to-face work was the norm, these social distancing practices have fundamentally changed how people work, leading to new types of work practices.

Managers are a unique class of knowledge workers because of their supervisory responsibilities. Time management is essential for managers to fulfill these responsibilities, and because the pandemic upset many scheduling practices, understanding managers' time use in the new work context is important. The paper by **Teodorovicz, Sadun, Kun, and Shaer** examines this phenomenon. The authors deployed a time-use survey among managers in two waves: pre- and post-pandemic. One of the interesting results is that the time formerly spent commuting for managers, and now freed-up, was on average devoted to work activities. But also, the workday expanded for managers: they stretched their workdays by interspersing personal tasks amidst work tasks. Work activities tended to be reallocated to evening hours. Allocation of time to different tasks also changed post-pandemic: managers tended to spend slightly more time in interactive activities. The structure of their tasks also changed, where they performed shorter, more fragmented work-related tasks. These changes were more pronounced for managers in larger firms. The results raise the interesting notion that managers might need to work more to recoup some of the rich information exchange and coordination that occurs easily when people are collocated. In remote settings, managers have to work longer hours to perform coordination tasks, now done online. The authors call for technology design to better support managers in coordination and communication. They also argue for future work to understand how organizational changes and technological innovations will impact remote work in a cyclic manner.

One domain of work where co-location was the undisputed norm prior to the Covid-19 pandemic is the production of live TV programs. This is not surprising, given the complex nature of the equipment necessary to create TV programs, and the need for tight coordination between the people who are involved in the production of TV programs. Yet the need for social distancing put pressure on this previously inarguable norm resulting in what **Okopnyi, Guribye, Caruso and Juhlin** call a redistribution of work, skills, and control. One notable example of work redistribution is that reporters in the field, and participants on TV shows, were asked to record themselves, instead of relying on a cameraperson. This required the journalists and participants to develop new skills, albeit building on their prior skills with technology, such as creating and uploading video from a mobile phone. All of these changes resulted in redistributing control: whereas before Covid-19, control firmly resided in the studio, during Covid-19, social distancing resulted in many aspects of production being controlled outside the studio by nonprofessionals (such as show participants), and by other companies (such as the providers of videoconferencing tools and network services). In an additional development, in response to social distancing restrictions, the role of automation has increased in TV production. With this increased automation in production, there is increased work for professionals in pre-production: the planning, scripting, and error-proofing of production. Will redistribution and automation persist as time passes and the pressure of social distancing eases? The authors speculate that the answer is yes, although they also believe that redistribution will be more important. The reason is because redistribution will allow the TV industry to bring on board creative

people and organizations of many backgrounds, and not just those who possess specialized TV production skills.

2. Future research questions

Despite the years of study in HCI and CSCW on remote work, we are still learning about it, and with the pandemic we have entered a new era. Twenty years after the paper *Distance Matters* identified factors associated with successful remote collaboration in a workplace setting, now with remote work conducted outside the office we must consider additional factors. The papers in this issue, through different perspectives, have identified additional factors that can contribute to successful remote work in a work-from-home setting. These new factors include having a growth mind-set, a belief that remote work can be developed as a skill; conducting sufficient social interactions, which can promote bonding and relationships; the ability to clearly define work and home-life boundaries; and configuring a dedicated workspace that is conducive to work.

Nevertheless, there are still critical questions that need to be addressed in future research. Some of these revisit longstanding questions in HCI, but take on new forms. First, what new tools are needed to support remote work, in different types of contexts, whether it be at home, in co-working spaces or other spaces? How can videoconferencing, currently commonly used in meetings, be improved? What can we expect on the horizon with VR in providing workplace support? How can we design better awareness systems so as to preserve the privacy of the home environment while still providing coworkers with relevant and timely information? Second, what skills are needed as we navigate this new context of remote, hybrid, and flexible forms of work? What strategies are needed to help individuals, teams and organizations better adapt? Third, how can people be motivated to do their best work when not physically situated with colleagues? What techniques would help managers in motivating employees? Fourth, as several papers in this issue have identified, how can informal social interaction, a key to developing common ground among coworkers, best be supported? How can we move from planned, scheduled social interaction to a more naturalistic approach? Last, how can we best support people in preserving their well-being while working from home? What can we do to combat loneliness and reduce stress? How can we help workers maintain clearer boundaries between work and personal life?

We find it important to underline the interdisciplinary nature of the explorations in this special issue: collectively the authors of the seven papers discussed above have backgrounds in business administration, computer engineering, computer science, design, economics, information science, psychology, and sociology. This is no accident – innovation often happens at the intersection of different disciplines, and we are convinced that this is the most fruitful path forward when exploring the interaction of people and technology in the domain of work. However, while HCI is an interdisciplinary field already, we need to reach further to bring in experts in fields such as organizational behavior, behavioral economics, management science, and other areas to tackle these hard research questions.

What the papers in this issue have clarified are the many common challenges that people in remote work contexts face, such as loneliness, stress, work-life balance, engaging in social interactions, and configuring physical workplaces. It is also clear that there are differences in past and present experiences of remote work, and likely remote work will continue to evolve in its nature. The findings reported here in different domains, ranging from academia to office work, can help us develop a better picture of what we might envision as we move toward a future of work that is still largely unknown.

Disclosure statement

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