

Is technology helping or hurting our ability to cope during the COVID-19 pandemic?

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ABSTRACT

With the introduction of the lockdown as a result of the COVID-19 pandemic, a quarter of the global population needed to turn to technology to continue living their lives. In light of this unprecedented rapid shift, there is much to learn about people's experiences and coping mechanisms. This paper explores how various forms of technology have been used during this lockdown period, and the kind of impact it has had on our coping ability. The study involved a total of forty UK-based participants who completed four-day long diary studies to encapsulate their experiences with technology during this time, further corroborated with in-depth interviews. We gained an understanding of the reality of our participants' experiences with technology during lockdown and explored the challenges and positive experiences they had. A variety of coping mechanisms were then discussed, such as adapting technology to meet their needs, or creating new habits in response to being home-bound. There was an overall positive attitude towards technology use during this time, as many were able to continue working remotely and remain connected with work, friends and family. However, participants mentioned concerns regarding excessive screen time and moments when they felt overwhelmed with being "always on". There was also an unnerving sentiment that as a society, we do not in fact have a choice – technology is ingrained into our day-to-day lives. This understanding of people's lived experiences during this time creates an opportunity for policy and further research to investigate support mechanisms during and beyond the COVID-19 pandemic.

Author Keywords

Difficult Life Experiences, Pandemic, Lockdown, Coping, COVID-19, Digital Emotion Regulation

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1. INTRODUCTION

The COVID-19 pandemic continues to have a profound impact on the world. Governments announced lockdowns and enforced "social distancing" measures. The United Nations Development Programme has stated that the COVID-19 pandemic has become the greatest global humanitarian crisis since World War II [1]. Within the UK, people were advised not to leave their homes except for essential reasons. Apart from essential workers, the majority of the population was required to work from home, if possible, and those who could not were either furloughed, or lost their jobs entirely. An abundance of uncertainty and distress arose since the announcement of lockdown across the UK on 23rd March 2020, as it was unclear when the measures would end, and what impact they would have.

These measures changed the way of life of an entire population and led us to what has been known as the "new normal". This new normal has constituted a massive adaptation to working, socialising and taking part in leisure activities from home. It is no doubt that as a result of the pandemic, technology has become intertwined in our lives more than ever before - daytime internet usage in the UK has more than doubled since the start of the pandemic [2].

While the concept of 'work from home' is not novel, it has typically been done on a 1-2 day/week basis, rather than full time. Throughout this time, the use of conferencing tools such as Zoom, Microsoft Teams and Google Meet have skyrocketed and reached 100s of millions of daily users [3]. Several people have been pushed to learn how to work from home and develop effective strategies to stay productive in their home environments. Previous studies demonstrate that working from home comes with challenges of maintaining and demonstrating productivity, and difficulties of separating the work/home life boundary [21, 22, 25, 28].

Socialising and partaking in leisure activities from home is also not a new concept, however, it has never been confined to a home environment, replacing the majority of our human interactions and attempting to replicate what we used to do outside of home. Social media use and social communication apps have increased in the UK, with WhatsApp reaching 49% in May (up from 20% in February), Facebook Messenger 41% (from 18%) and FaceTime 30% (from 13%) [36]. New apps have also been adopted, such as Tiktok, or Houseparty, which rose from 175,000 users to 4 million users between February and May 2020 [36]. Between March

and May, the UK saw 4.6million new video-on-demand (such as Netflix, Amazon Prime, Disney+) subscribers [4].

Beyond using technology for work and socialising purposes, technology is also actively used by people to cope with difficult life experiences [6, 8, 9]. This life disruption has affected people emotionally in different ways. Some have been challenged by the limitations of being confined in their homes; a few have said they are enjoying this time to turn off and stay at home; others are dealing with bereavement and the devastating loss of life; many are fearing loss of jobs during this recession. For the majority, this time has proven to be a difficult experience. A recent survey has found that one in five adults have been likely to have experienced some form of depression during the pandemic – a 50% increase since last year [5].

This paper seeks to understand people’s experience with using technology during lockdown and investigate if it had a more positive or rather negative overall effect in enabling them to cope. While we are not expecting a clear-cut answer, the nuances of their emotional ups and downs can provide us with useful data and an understanding of the types of situations that contribute to positive or negative experiences.

To explore these questions, a qualitative study was conducted, consisting of a demographic survey, two interviews and a four-day diary study, completed by forty UK-based participants. The experience and key challenges faced by the study’s participants during lockdown, as well as their coping strategies in this ‘new normal’ were extensively discussed. This study is motivated from previous work in understanding the role of technology in life disruptions. Calls for research in an ongoing and post COVID-19 era, as well as Greg Wadley’s [13] notes on future research in digital emotion regulation, have inspired this paper. The lockdown in the UK provided an opportunity to study how people turn to technology in these situations and learn about the nature and quality of life in the context of the current crisis. Ultimately, through a deeper understanding of technology-related challenges faced during the lockdown period, along with successful coping strategies, appropriate technology design and policy can be developed to support the wider population.

It should also be noted that the definition of technology in this paper constitutes any use of digital devices and the internet. The scope of investigation focuses on participant activities related to work, socialisation and leisure.

2. LITERATURE REVIEW

Challenges related to the pandemic have proven to be, to some extent, a universal experience. The lockdown environment provides a unique testing ground to deepen our understanding of the human relationship with technology in the context of difficult life experiences.

The literature review will begin by exploring approaches to coping with difficult life experiences, and then focus on using technology as a strategy for coping in this context. It will also explore technology specific strategies of dealing with working from home, as the majority of participants are either working or studying from home during this period. Finally, given the recent nature of the pandemic, there is limited data relating to how we use technology as a coping strategy in lockdown. There are some papers that have started to address aspects of this which will be discussed. The review will therefore include both pre-COVID and more recent literature. It should be noted that while pre-COVID work helps us understand common behaviours patterns in similar situations, it does not consider a lockdown mandate which limits opportunities to leave our homes.

Coping with difficult life experiences

Herron et al. have defined sensitive experiences as "life events and life transitions which see individuals in a vulnerable state" [8]. Massimi et al. have defined a life disruption as “a life event that is unpredictable, uncontrollable, and destabilising” [6]. While the pandemic has not been used as a contextual example in literature in the past, given its emotional effects and consequences, it can be classified under this umbrella of ‘difficult life experiences’.

According to psychological literature, when life disruptions or sensitive life experiences do occur, people resort to different forms of coping. Folkman and Moskowitz [9] define coping as “the thoughts and behaviours used to manage the internal and external demands of situations that are appraised as stressful”. After evaluating traditional approaches of the ‘animal model’, which focuses on avoidance and escape behaviour as a coping mechanism [37], and the ‘psychoanalytic ego psychology’, which outlines using realistic and flexible thoughts to solve problems and reduce stress [38], they present their own method. They outline three different ways of coping: problem-focused, which focuses on directly addressing the issue causing distress; emotion-focused, which targets reducing the negative association with the issue; and meaning-focused, where cognitive strategies are actively used to attempt meaning-making, and also include a social factor of other people providing potential emotional support. As the authors themselves point out, while it is useful to understand these coping strategies, they are quite broad, and may be more or less useful depending on the context [9].

Emotion regulation can be considered another form of a coping strategy. It is focused on influencing the emotions we have, when we have them, and how we experience them [41]. While our emotions can serve us well, during difficult life experiences such as the pandemic, they can mislead us and do more harm than good. Regulating our emotions, either actively or passively, can help us cope. The study of emotion

regulation has been widely linked to coping, e.g. by Lazarus & Folkman [42]. James Gross presents the ‘process model of emotion regulation’ [41], explaining that strategies that act earlier in the emotion-generative process are usually more effective than later. He presents two main coping strategies, the first being ‘re-appraisal’, where reassessing a situation can decrease its emotional impact. The second, ‘suppression’, focuses on suppressing outward expressions of emotion. Conclusively, the former is found to be more effective in emotion regulation, noting context dependence.

Skinner & Zimmer-Gembeck [52] also highlight perceived feelings of control as a coping mechanism with difficult life events, highlighting relevance throughout all stages in life. Much of psychology literature also explores the negativity bias phenomenon, where our brains are wired to be more sensitive to negative experiences over positive [57]. This makes coping with difficult life experiences more challenging, however, using proactive coping and positivity offset can help [58].

Awareness of these broader theories and coping strategies can help us make sense of some of the methods of coping used by participants in the study. As has been noted by the authors, context is key. Coping has been examined in a range of contexts relevant to this study, such as bereavement [39], death of a family member [6], and job loss [40]. These studies have often referred to the role of technology as a support mechanism, or enabler to connect to support networks.

Using technology to cope with difficult life experiences

Researchers in HCI have extensively investigated the role of technology in dealing with difficult life experiences, demonstrating that technology can provide a support role during times of disruption and uncertainty [6, 8, 9]. Massimi et al. [6] note that as technologies are a core part of our lives, they influence and change the ways in which we cope. They argue that this relationship with technology is reconfigured in order to mitigate some of the consequences of these disruptions, as the individuals transition towards ‘a new normal’.

Our tendency to use technology as a coping mechanism is both passive and active. At times we actively seek support through technology and understand how it influences our emotional state, while at other times our reactions seem automatic, where we come to realisation upon reflection, or not at all [61].

When we attempt to actively alter our emotional response using technology, this is known as Digital Emotion Regulation [13], building on Gross’ Emotion Regulation [41]. This can take place in several forms, such as playing games, listening to music, watching online content,

consuming social media, reading the news online, or using video meetings.

Iacovides & Mekler [7] and Collins & Cox [10] explore the role of gaming during difficult life experiences, identifying that gameplay can offer people much needed respite and an opportunity to connect with others. However, there was reported tension between “the potential benefits gaming can provide and the perceived value of the activity”. People felt it was unproductive, and consequently felt productivity guilt, even though the activity itself was helping them emotionally. Wadley et al. [13] also notes that technology which is often deemed as unproductive can help people with emotion regulation.

In another study, Wadley et al. [11] investigate the use of music streaming platforms by international students in unfamiliar environments, learning that music can be an effective method for emotion regulation, enabling some people to reach their desired affective states during challenging times.

There are several studies that demonstrate that technology is extremely useful in allowing consistent contact with friends and family [16, 17, 18]. However, these need to be scrutinised as the positive experience of these conversations depend on the users’ personality or preference for these interactions (e.g. are they a social butterfly or do they prefer fewer interactions). Those who feel more negatively towards this type of communication may feel a spur of anxiety and possibly technophobia [19]. Lee [20] finds that during times of distress, those who have positive sentiments towards online communication and staying in touch with others do feel better, while those who don’t, may feel more negative emotions.

The question of whether we turn to technology to regulate our emotions, or whether in fact technology triggers new emotional responses, or both, has also been explored. Sarsenbayeva et al. [15] finds that the use of phone applications prompts certain emotions, but also that people turn to their phones as a distraction when feeling negative emotions. The category of application and duration of use affects the emotions felt. Thus, the directional relationship technology has with our emotion regulation can enhance or deter its coping ability.

During times of uncertainty, people often reflect on their existence and place in the world, with aspects such as the pandemic being out of their control, where technology enables maintaining some semblance of normality. Kaptelinin [12] highlights that the impact of technology on human life makes it crucial for HCI research to explore aspects of human existence and argues for HCI to play a bigger role in this space. He explains that HCI has moved beyond designing better digital products, to also encompass an understanding of how technology impacts the way humans create meaning in their lives. Understanding the

lockdown experience and associated existential thoughts through this paper can contribute towards Kaptelinin's envisioned 'existential inquiry framework', which is framed around XXP's big five existential concerns [43] – two of which are relevant to the experience of lockdown, specifically isolation and restricted freedom.

Understanding this changing relationship and attitude to technology, whether it is actively sought out or passively automatic, across a range of applications, can help us support people better and make technology work better for us.

Work from home: Technology specific coping strategies

There has been extensive research over the last few decades in investigating the 'work from home (WFH)' model, and its challenges. This is particularly useful in the context of this paper, as where possible, the majority of the population shifted to work or study from home.

A challenge often discussed is the difficulty in separating work and personal life boundaries [22, 25, 28], in terms of difficulty in detaching oneself from their work. This is especially the case as the same device often used for work and leisure [62]. The concept of 'autonomy paradox' is also relevant, where there is initially a perceived benefit of flexibility that technology offers, but in fact demands constant availability [21].

Employee isolation poses another key challenge. It is a psychological construct that describes employees' perception of lack of opportunities for social and emotional interaction with other organisational members [23]. Brooks et al. [24] highlight that "confinement, loss of usual routine and reduced interpersonal contact will engender feelings of work-related isolation". Such feelings can create a negative valence towards working from home.

Working from home also an increased perceived pressure to demonstrate productivity. This often leads to work being task-based rather than time-based, and can lead to longer hours and further difficulties in detaching from work [21].

As these challenges are increasingly commonplace, existing coping strategies have been defined. Keeping separate devices [45] for work and non-work related activities has proven to be helpful, however, this may not be a feasible option for all given potential high costs. Another strategy is work planning, where tasks are broken down and daily goals are made. Both digital and non-digital tools are used for this [46]. Meeting these goals can make employees feel accomplished and productive. However, plans can often be overambitious – one study found that their participant sample left 34% of work incomplete by the end of the day [47]. Pandemic-related disruptions can make a full-time work from home schedule even more challenging.

More recently, Rudnicka et al. [44] have explored effective strategies for remote working during the pandemic, in light of the challenges mentioned above, as well as noises from neighbours or taking care of children. They suggest that setting digital and household boundaries, or setting expectations about schedules at work, were some of the useful strategies. In terms of physical boundaries, creating a separate workspace is another solution, but is acknowledged that this may not be a ubiquitous solution.

Our study aims to build on these coping strategy insights and also fill the literature gap of working remotely in the context of a pandemic-related lockdown. It is important to understand the impact of working from home, as following the lockdown, several employers now feel that large-scale remote working is possible [35]. While office use will still be relevant, it is extremely unlikely that it will go back to the level it was pre-lockdown. And this shift to a potential hybrid model means that it is essential for us to understand what 'working from home' under these conditions actually means, so that we can support workers in successfully doing their jobs.

Using technology as a coping mechanism during the COVID-19 pandemic

As the pandemic has had a global impact since March this year, literature on the topic is still fairly limited. Calls for research in this space have motivated this paper.

Beyond the aforementioned technology-specific coping strategies for 'work-from-home', a few papers have addressed challenges and coping strategies outside of the work / study context. Daruwala [26] explores the predictors of technology phobia such as computer anxiety that may arise during lockdown. He explains that the root causes of technophobia are centred around computer dependency, data surveillance, information overload and personality type. Due to these fears, he calls for further research on how to deal with stress with regards to this ICT phobia. Jaiswal and Arun [28] found that those working from home had increased levels of stress and reduced levels of productivity, but some also had unexpected sparks of creativity. They call for further research into understanding how productivity is measured from a company perspective in a work-from-home context, and the types of people who may thrive in home environments.

In terms of coping strategies, nostalgia-based leisure during lockdown [27] has been discussed as a coping mechanism, with "various media channels replaying famous sport matches, classic films and memorable concerts from the past." Gammon & Ramshaw [27] argue that nostalgia may end up being one of the primary cross-generational coping mechanisms in enduring isolation, where social bonds and the sense of community created expected to last beyond the pandemic.

A Spanish survey found that 65% of their 5545 sample of adults reported anxiety or depressive symptoms during the lockdown, and their coping strategies included avoiding COVID-19 related news, following routines and hobbies, and spending time outdoors where possible [48]. However, during the period of the lockdown, being outdoors was not always possible and people needed to find alternative ways to cope. Another study in Zimbabwe found that people resorted to WhatsApp groups to connect with others. Most Zimbabweans used indoor games with family members, exercise, listening to music and gardening as coping strategies [49]. Devi [50] highlights that staying connected with others and keeping a positive attitude during this time can help. Butler & Jaffe [33] also find that acknowledging privileges and finding gratitude has been a coping mechanism as well.

Literature review summary and next steps

The aforementioned works have helped us understand what we know about coping, difficult life experiences, using technology as a support mechanism during life disruptions and working from home. While some papers have started exploring this space, we are still trying to understand more about how people used the technology to help them cope with experience of the pandemic. This paper focuses on this role of technology and is in the meantime also attempting to address calls for further research raised in the more recent lockdown literature.

Understanding what we know and don't know from these four angles of literature review help us with the direction and method of answering our research question.

3. METHOD

Overview of study

The study was initially exploratory, focusing on understanding the different ways people use technology as a response to emotions experienced in the context of the lockdown. Following data collection, the focus was refined to understanding how individuals use technology differently during lockdown. We investigated the contexts in which technology acted as a support mechanism, and conversely in which contexts it acted as barrier to coping. Given the potentially sensitive nature of the focus of the study, we wanted to ensure that participants did not experience any major discomfort during the study. We therefore asked open-ended questions and only prompted participants to discuss incidents that they were comfortable with. We attempted to make our interviews more conversational in order to blur the boundaries between our participants and our role as researchers [29].

Procedure

The study was divided into 4 phases: Survey, Interview 1, Diary Study, Interview 2.

Upon clicking the survey link, participants were introduced to the study and were asked for consent. The survey instructions emphasised the voluntary nature of participating and explained that withdrawal was possible at any time. Participants were required to be over the age of 18 years. The purpose of the survey was to collect demographic data – full name, email address, age group, gender, employment situation, working/studying arrangements, and confirmation that the participant was UK based during lockdown. There was also a text box at the end of the survey for any other comments. There were 10 questions, and on average, the survey took 2 minutes to complete.

Following completion of the survey, participants who met the criteria (i.e. were UK based during lockdown) were contacted by email on a first-come first-serve basis (however, further into the study, we started contacting people from more diverse demographic backgrounds in order to have a more even representation from the data). In the initial email, participants were reminded of the purpose of the study and asked to book in a slot for the first interview using the Calendly application. Once booked, the first meetings took place remotely via Google Meet.

During the first interview, the researchers explained the types of emotional events and technology usages that the study covers, as well as what is expected of the participants during the third stage, which corresponded to a diary study. The participants were also asked to provide an example of a recent emotional event and how they used technology to respond to it. This was in order to ensure that the participants had an idea of the type of incidents they should be writing about in the diary study. The interviews lasted an average of 20 minutes.

During the diary study, which took place over four days (two working and two non-working days), participants were asked to take notes of specific emotional events where they used technology to manage the emotions they experienced. They were also asked to keep note of any differences in their technology usage given the lockdown context. Participants were given the freedom to take notes in any form they wanted, and whenever they wanted. They were also assured that they would keep their notes to themselves, and would only be used to jog their memory of relevant events during the closing interview. The researchers would not have access to the notes.

During interview 2 (closing interview), the moments when participants engaged in digital emotion regulation during lockdown were discussed. We asked them about the types of emotions they were feeling, what caused these emotions, which technologies they used, and what effects each technology had on their emotional state. A topic guide was used to guide the interviews, however they were mostly conversational. The interviews lasted an average of forty minutes.

Both of the interviews were recorded and deleted after the transcribing was completed.

Materials

The following materials were used throughout the remote data collection:

- Google Meet was used as the platform to interview participants.
- A topic guide (in a physical notebook) with prompts for discussions during Interviews 1 & 2 was used
- Calendly was used to ask participants to book themselves for interviews
- Qualtrics was used for the demographic survey
- A dedicated research email address was used to contact participants
- Amazon vouchers worth £25 were sent to each participant for taking part (£8 after interview 1, £17 after interview 2)

Participants

Participants were recruited from the UCL Psychology Pool and Twitter. The study was open to anyone who was based in the UK during lockdown. A total of 93 clicked the survey link, of which 80 completed the survey. Of these, 70 participants met the criteria of being UK based during lockdown. These participants were contacted, with a few dropping out or not responding. Finally, a total of 40 participants formed the sample.

Age Group		Gender	
18-29	29	Female	27
30-39	5	Male	12
40-49	3	Transgender Male	1
50-59	3		

Table 1 and 2. Age group and gender of the 40 participants.

Employment status	
Employed	17
Student	11
Part-time Employee and Student	6
Unemployed	2
Other	4

Table 3. Employment/Student status of the 40 participants.

Working/Studying from...	
Entirely from home	33
Partially from home	3
Out of home	1
Not currently working/studying	3

Table 4. Location of employment/study during lockdown of the 40 participants.

Participants in the ‘Other’ category were marked as ‘Employed and Freelancing’, ‘Furloughed from part-time

job’, ‘Self-employed’, and ‘Choosing not to work, but with the possibility of either going back or ultimately retiring’.

For many participants, using technology was one of the main coping mechanisms of dealing with lockdown (n=31). However, several people also mentioned actively keeping away from tech (n=12) and other non-technology related activities, such as cycling, painting, playing musical instruments were helpful. These groups often overlapped, where both methods were used to cope. Outlooks on the effect of technology use of lockdown were also mixed, with the majority being grateful for technology during lockdown (n=36) while others were not very happy with it but accepted it (n=4).

Thematic analysis

To analyse the responses, an inductive thematic analysis as outlined by Braun and Clarke [30] was conducted. The aim of the study was to gain a rich understanding of the various ways and reasons why people use specific technologies during lockdown and the effect it has on them, rather than focusing on specific emotions or specific modes of technology. The initial data was reviewed (interviews 1 and 2 were combined for each participant, making 40 longer transcripts in total). Following the familiarisation stage, initial codes were manually created based on the relevant findings, which were later grouped. Some code examples include “Wanting to be distracted”, “Escapism”, “Trying to re-create my morning routine”. Codes were both semantic (what participants said) and latent (participants’ further meaning underlying the semantic content). The first set consisted of 203 codes in 16 groups. These were refined and wider themes were defined, forming 120 codes in 12 groups. The final stage involved further refinement with the codes being re-grouped into wider themes. Overall, the inductive thematic analysis resulted in 98 codes & 9 themes.

4. RESULTS

In examining the ways technology was used during lockdown and understanding the emotional ups and downs of our participants, the results are structured as follows:

- (1) Participants’ experience / reality of the lockdown
- (2) Challenges and positives of lockdown
- (3) Coping strategies (relevant to the challenges mentioned in (2)). This section is divided into the following sub-themes:
 - Adapting technology to fit needs
 - Adopting new habits
 - Changing existing habits
 - Staying connected
 - Escapism/distraction

- Non-technology related coping strategies

The themes are not mutually exclusive (e.g. participants who started new technology related habits may have also used non-technology related coping strategies). Each theme and sub-theme is discussed below with illustrative quotes, labelled by participant number, gender and age, e.g. (N40, 30-39, M) refers to participant number 40, aged between 30-39, Male. Quotes are also kept in original spelling and punctuation.

(1) Participants' experience / reality of the lockdown

The focus of this section is to briefly set the scene and determine the variety of technology-specific activities that our participants undertook during the period of lockdown in the UK.

Our sample was a mix of students (n=17) and employed persons (n=23), with some participants being both employed and studying. As a result of lockdown, participants needed to transition to a remote way of working, socialising and relaxing from home. Technology was used by participants on a daily basis for work, often accessing collaboration tools such as Microsoft Teams and Zoom. For social communication, apps such as Whatsapp, Facetime and Facebook Messenger were used. Examples of birthday celebrations and work socials over Zoom were mentioned. For relaxation activities, participants mentioned video streaming platforms, such as Netflix, Youtube and Amazon Prime; games, such as Mario Kart or social games, such as Houseparty. Music platforms, namely Spotify, Apple Music and Youtube were used both during the day while working, as well as in the evening to wind down.

Overall, participants mentioned they had more time than usual, and used this time to do more of their existing technology-related habits or explored new technologies. As several people transitioned to this remote way of working very suddenly, there was a mix of sentiments. Some people, more often in the 18-39 age group, felt comfortable with the transition as they had been using technology on a daily basis anyway. However, others felt overwhelmed, and some were unfamiliar with using applications such as Zoom or Microsoft Teams, which they were required to learn. It should be noted that all of the participants, whether they were familiar with technology or not, felt a need at some points to step away from technology, as it was 'overloading' or 'overwhelming' them.

(2) Challenges and positives of lockdown

This section outlines the technology-specific challenges participants faced during lockdown, as well as some often-unexpected technology-specific benefits.

Challenges

As the shift to remote working and living was sudden, all participants described struggles – including those who were accustomed to using technology on a regular basis.

The most discussed challenge was **screen time**. Participants explained that their screen time had almost doubled as a result of the switch to digital. This was both because of working from home, but also because participants reported an increase in the amount of time they had, which often led to a screen related activity (such as watching a film or video calling). N=4 participants mentioned that as they do not need to commute to work anymore, this reduced time spent listening to audiobooks and podcasts, replaced additional screen time. Concerns regarding fatigue and eye strain caused by screen time also arose. *"The screen time wasn't very healthy for you, sometimes you can get headaches or your eyes can get a bit tired"* (N17, 18-29, F). *"I worry about my eye health right now, that the vision, my sight. Because I guess for me, I look at a screen all day for work."* (N16, 18-29, F).

Participants were more conscious of their screen time than before lockdown, but also felt they have no alternative.

"But now it's [screen time] just probably taking up a majority of my day. ... I feel like oh, I need to take a break. And what's to do with my break, I go towards the news, you know, or friends and family sometimes and it's like, oh my god, this is too much. But then what to do. On a normal day ... I would probably just go out for a nice walk or something like that. ... So I used to do a lot of that, but I can't do that anymore." (N1, 18-29, F).

Participants also felt that they were not in control of their technology use and are more reliant on it since lockdown. *"It's that unpleasant feeling of having to rely on technology"* (N23, 18-29, F).

Participants discussed frustration with aspects that seemed out of their control, such as their **broadband connection quality**. *"Everyone is at home on your line as well, it's just taking a bandwidth, it's reducing the quality. So it is sort of becoming quite annoying actually."* (N40, 30-39, M).

As participants were dependent on staying connected, their Wi-Fi connection was a big issue. *"It was so frustrating especially at a time like this when we are so dependent on being online, digitally present everywhere"* (N1, 18-29, F). This was often mentioned as being frustrating in the context of both work and relaxing (e.g. videos not streaming).

There was also an increase in the amount of **news** that was consumed, and people who have never watched news started doing so. Sources such as BBC, Twitter, Facebook as well as Whatsapp were mentioned. More than 50% of the participants expressed that the news caused negative emotions, specifically COVID-19 related news. *"The only*

thing I saw on the news were Coronavirus deaths and lockdowns everywhere, so it used to be really bad for me. I used to feel depressed reading all of that” (N1, 18-29, F). “I mean I read the news now more than I used to, which I don’t think is a good thing really. It takes up far too much time. And it can make you angry as well” (N34, 40-49, F).

Participants reported that they consumed news more at the beginning of lockdown and regularly checked the number of cases online, however, this reduced as the lockdown progressed. The reasons quoted included the repetitive nature of the news being reported and participant sense of being overwhelmed. *“There’s just so many things that you can read, that is never ending and yeah, like it’s overwhelming because you can never just finish reading everything that’s available, you know?” (N8, 18-29, F).* It was also causing negative emotions among participants, and thus was actively avoided. *“I mean I rarely go on Twitter these days. I found that a very angry noisy space” (N33, 40-40, F).* Participants expressed frustration at the news just focusing on being sensational and capturing attention, rather than offering comprehensive reporting. Other participants expressed concerns of ‘fake news’ which led them to avoid checking the news altogether.

Productivity guilt was a challenge frequently mentioned. Participants often felt a need to stay productive at home. Two angles were mentioned – one was to prove at times that they were being productive to their employers. *“I keep thinking that my boss is thinking that I’m not working, you know, I’m just probably overcompensating for working from home.” (N1, 18-29, F).* The other was when they were relaxing in order to cope with the challenges of the lockdown, but often felt that they should be working. *“I was quite averse to like being on social media or being on my phone or be watching TV because I felt like you know, I needed to use my time better. I did not want to just sit around and do nothing like I was really like, I get really restless and I was kind of worried about that.” (N26, 18-29, F).* Participants often reported that using technology for non-productive reasons did help for a short time, but the longer they used it, the more guilty they felt. They also attempted to find productive alternatives to being non-productive, such as listening to a podcast over music. *“I listen to podcasts because I’m trying to like be more, I guess more productive than listening to music. When I’m in the ... mood to like learn something new. It’s listening to music mindlessly. I feel like I’m not learning anything and I feel a bit guilty” (N8, 18-29, F).*

N=4 participants also noted that they felt more productive when they were feeling positive emotions, and very demotivated with negative emotions. Overall they found the period of lockdown hard to be productive, as their mood was generally lower.

Participants also mentioned **challenges with detaching** from work, or creating the work-home divide. One reason was that

participants were using the same device for work and entertainment, and often felt compelled to check work emails. *“The problem is there’s no law of detachment anymore. So it’s, it’s basically like I can never turn off from work” (N1, 18-29, F).* Participants also noted that the fact that there no commutes or physical boundaries to divide work and home life made it harder for them to detach.

Issues with creating **authentic conversations** online were mentioned. *“I think for me, I find it much easier to be empathic with people face to face. Um, and I think over zoom or over messenger and stuff, I find it more difficult to show that I’m listening and show that I’m being kind” N28, 18-29, F.* Participant N2 mentioned feelings of ‘fake’ concern and checking in with friends or organising catch up calls as lockdown began. Technology has also not been able to replace human affection – some participants who had lost some friends or relatives due to the virus expressed grief at being unable to ‘physically be there, touch them and just be affectionate’.

Overall, participants found it hard to describe their emotions explicitly, but often said it was a mix of **emotional extremes**. All participants mentioned a variety of negative emotions at some point during this time. “Helpless”, “stuck”, “demotivated”, “lazy”, “uncertain”, “depressed”, “wanting to escape”, “wanting to be distracted” were feelings mentioned several times. Approximately half of the participants mentioned feeling bored during this time, due to the increase in free time. *“I think life seems to be more monotone at the moment” (N13, 18-29, F). “I don’t do boredom very well. So that’s probably kind of swinging between entertaining myself and actually getting stuff done and feeling completely bored out of my skull. There’s only two kind of swings. Especially at the moment, that’s probably most common.” (N37, 18-29, F).*

There were also challenges of participants given their **living situation**. Participants living alone said it was challenging but were grateful they had technology to stay connected, while participants living with others mentioned it was comforting to have company, however, often faced issues with noise their Wi-fi connectivity. *“I have a colleague who lives with seven other people. And she said, it’s mad. She says she can’t wait to go back to the office because internet doesn’t work. It’s always loud” (N5, 18-29, F).* Those living with children had additional challenges, as they needed to spend time teaching or taking care of them.

Positives

While the majority of participants discussed challenges, n=10 participants mentioned positives that arose during lockdown. Some participants said that they do not feel as guilty watching TV content or playing games as they have more time to spare. They were also pleased that they could spend time on their hobbies and do online courses. N=3

participants mentioned that they were happy they did not have to commute anymore. N=5 participants mentioned that lockdown enabled them to have a good routine that they could follow. *“Being stuck at home means that now I have a little bit more of a fixed schedule, which is something that I really like having but I didn’t have for quite a while”* (N24, 18-29, M).

While all participants acknowledged an increase in technology use, overall, they agreed that they were glad that technology enabled them to remain connected with others and continue their work, as well as stay entertained through streaming platforms. Participants also mentioned they had time during lockdown to reflect and understand themselves better. N=2 participants in the 50-59 age bracket explained they used ‘the internet’ more and were surprised that they enjoyed virtual meet ups.

(3) Coping strategies

Overall, the lockdown proved challenging in some ways for all of the 40 participants. Several technology-specific coping strategies were discussed during the interviews, which are presented below.

Adapting technology to fit user needs

Over half of the participants described ways they used technology to enable them to partake in activities that were impacted by the lockdown. The most common example was using social media and communication applications to stay in touch with family and friends, where they would have usually met in person.

Two participants mentioned they had missed the **cinema** feel, and therefore purchased a projector to try to re-create that feel at home. *“So, before lockdown me and all my friends we used to really like going to the cinema, but then now we can’t. So then we got a projector and put it up on the wall and watch movies like this”* (N35, 18-29, M).

Participants who missed the social interaction of watching films with company, either at home or in the cinema, mentioned Netflix party – an extension introduced by Netflix that enables multiple people to watch Netflix content at the same time, while chatting in a chat box. This enhanced the social experience for them.

Another participant had explained they missed **travelling** during lockdown and would browse the destination they were meant to go to on Google Earth. *“Two of my trips that I had arranged were cancelled. I was missing that so I just started browsing those destinations. It’s quite funny, but basically, you know, the Google Earth has got this very cool platform where you can browse and really almost looks like real you know, because yeah, yeah, it’s really cool”* (N5, 18-29, F). While it wasn’t an experience that could be replicated online, they were able to somehow compensate for not being there.

As gyms were closed, several participants were unable to **exercise** in their usual environment. N=9 participants found new ways to exercise during lockdown, using Youtube videos, apps, and Zoom classes. However, due to homes not being set up for exercise classes, several participants had limited space, and thus opted for exercise in the park. *“Now I’m always out exercising in the park and I take my speaker with me to listen to music. It gives me great joy to have music just downloaded or listen to the radio while exercising in the park”* (N31, 30-39, M). Participants also explained they used online platforms to purchase new gym equipment during lockdown.

Participants tried to re-create **social events** virtually. Celebrations and work socials took place virtually on platforms such as Zoom. One participant explained she had regularly attended pub quizzes with her local team – they had now started doing this virtually, and in fact were able to meet more often due to ease of connecting and more availability. *“I have a quiz team, we would meet up in a pub probably every fortnight. And so obviously with that not happening. ... I do think more people have been doing more frequently during lockdown. Probably like once every week, and that Thursday and Friday I did two quizzes in a row and that’s not normal at all. Yeah I wouldn’t normally do that but I feel like it’s not much else to do so lots of people are more available”* (N18, 30-39, F).

Adopting new habits

Participants attributed the fact that they had more time during lockdown to forming new habits.

N=15 participants, who usually rarely play **games**, explained that they started playing games during lockdown. The type of games were varied, some using gaming consoles, while others used simple app games on their phone. The importance of the social element of gaming was mentioned several times. *“I played the game to other people online, it’s a way to connect with friends even though we have to stay socially distance”* (N39, 18-29, F). The application ‘Houseparty’ was mentioned n=4 times, which enables people to video chat and also play simple games. Participants explained that this app proved to be very popular due to the nature of being able to stay social as well as keep the conversation playful. The same was said about organising quizzes on platforms such as Zoom. *“So, and after the quiz happened, we just stayed on zoom with my friends and just chatted for a bit and played a few games, which was good”* (N18, 30-39, F).

N=6 mentioned using the extra time they had to **‘digitally de-clutter’**. These activities included organising playlists on Spotify, backing up files, or organising bookmarks on the browser.

N=7 participants explained they used this time to **explore new technology**. N=2 participants purchased an Amazon Alexa, and another n=2 purchased VR headsets. Participants also used this time to familiarise themselves with new technologies. One participant explained this time enabled her to support her parents with understanding how to use the Facetime application. *“The nice things is being able to have more time in the day to the phone my mom, to FaceTime her, which is something my parents didn’t know how to do at all until the lockdown. So I can’t see them, It’s nice to be able to see their face and I used to call my family once a week and now I call them everyday that’s quite nice.”* (N16, 18-29, F).

Participants mentioned that they often felt helpless and had no control over the situation during lockdown. N=6 stated that **feeling in control** of different aspects of their life helped them cope. One participant said that writing out his schedule helped him during this time. *“Even more important during lockdown, because you don’t have to really control the situation but you actually try to like find to control things. So yeah, try to like, schedule up beforehand”* (N2, 18-29, M). Another participant explained his frustration at reading the news on Twitter, but that responding to comments and having a conversation helped him feel more in control. *“But interestingly that Twitter in that circumstance was both the cause of my irritation and my emotional state, not a positive state, but it was also the solution to the state and not necessarily solution. That’s not the right word, but it did allow you to facilitate a dispersal of my emotional anger or whatever it was that was built up and became a little bit of satisfying diffusion of the emotion.”* (N20, 50-59, M).

Participants noted they were using **music** more often in order to concentrate. Several participants complained of noises from neighbours and the street, and thus used music as an attempt to block out these sounds. Music was also used as a tool to bring back old memories. *“Whenever I listen to that song ... in lockdown, I’m transported back to that place immediately. So music is definitely one way of basically just daydreaming about being outside and travelling to all those places that I want to”* (N1, 18-29, F).

The amount of **online shopping** increased during lockdown, as several stores had queues and had limited stock. *“Yeah, we haven’t been able to go to shops in person. And so some of the time where I would have gone to shopping personally, I’d have instead gone online. And that’s happened quite a few times”* (N7, 18-29, F).

New habits, such as **cooking**, were introduced during lockdown. Cooking trends began and online recipes and Youtube videos were used to support these new habits. New **exercise**-related habits emerged, such as cycling, as public transport could not be widely used during this time. N=2 participants explained they used cycling apps to explore new parts of London during this time. Yoga apps were used by

n=5 participants, partially as these apps introduced free subscriptions, as well as because other participants were unable to go to their usual group yoga classes. For **mental well-being**, n=2 participants started using colouring and journaling apps.

It should be noted that several participants reported that they stopped some of these habits as lockdown progressed. This was specific to participants who had started a new habit, such as games, exercise, reading the news. Reasons are people were more motivated at the beginning to use the time on these habits, but they often did not stick.

Changing existing habits

All participants were already using video streaming platforms pre-lockdown – the majority were reported greater use during lockdown. The reason behind this was mainly more time and it was an antidote to boredom, however, the reason why it was chosen over other activities was easy access. A phone felt easy to pick up, or TV / laptop as it is all set up, with one button launching Netflix or Amazon Prime. *“So picking up a book would probably feel kind of too hard if I’m kind of really set up to have the focus to do it. But watching a video is going to feel a lot easier. So I think I just choose like maybe the closest thing to me.”* (N11, 30-39, F). The same approach was described for games, social media and music, but was not mentioned as frequently as videos.

Social media use had generally decreased. N=11 participants explained they were using it less, because they had less to post about (as they were mainly at home), and that it was having a negative effect on them when they saw something COVID-19 related (similar to the effect news had). One participant also mentioned he was not using travel apps or websites at all anymore.

It should be noted that n=2 participants reported reduced technology use across the board, and wanted to completely stay away from technology. N=3 participants stated their habits did not change at all since lockdown.

Staying connected

Every participant used video calls more frequently during lockdown, both for work purposes, as well as social calls with family and friends. This was used to maintain the feeling of connectedness and an effort to replace interactions that would take place in person. *“I’m doing more FaceTime chats with friends. So before, you would just call friends as normal or just send a WhatsApp message. But now I’m doing a lot more video calling to family and friends. So that’s one thing which has changed, which I think is a lot nicer. It’s actually nice to see people’s faces. So it has given me a lot more joy.”* (N31, 30-39, M). Platforms such as Facetime, Messenger, Whatsapp, Zoom and Instagram were mentioned.

Escapism/Distractions

A major coping strategy for participants was escapism and distracting themselves from their reality. This was usually done outside of work in the form of playing games, listening to music, or watching TV shows. *“It’s like feeling like now you’re in a different world and no problems currently exists. ...They shift your focus from our problems. And then you just, you’re focusing with the task, and you know, if you’re winning that’s great, they can actually lift your mood. If you’re not that, at least like you’re focusing on a virtual problem that obviously doesn’t have as much in practice real problems.” (N17, 18-29, F).*

Non-technology related coping strategies

While the study is focused on technology specific solutions, it is worth noting that n=18 participants mentioned non-tech related coping strategies, where they actively tried to get away from technology for some time. Due to the negative effects of following the news, n=2 participants followed active ‘no news/social media’ days. Other participants actively went out for walks without carrying their devices. Walks were also used by n=2 participants in the mornings to re-create the feeling of a commute, to form a kind of physical separation between living and working from home. *“And what I found really helpful during this whole process ... it sounds a bit weird but I just try and replicate my walk home from work” (N18, 30-39, F).*

5. DISCUSSION

The research community currently lacks insights about how such a disruptive life event, akin to a pandemic, and living in a lockdown might impact people’s relationship with technology, both in terms of attitude and coping ability. To start filling this gap, this paper investigated the way that technology was used during the period of lockdown in the UK, and tried to gauge whether technology proved to be a more positive or more negative force in supporting people with coping with the consequences of the pandemic. An introductory literature review gave an overview of the current research focusing on the areas most relevant to this study, namely coping strategies, technology use during difficult life experiences, as well as more recent literature on working from home and the COVID-19 pandemic experience in relation to technology. Qualitative research involving diary studies and in-depth interviews with forty participants found key themes which were described in the ‘Results’ section of this paper.

In this section, the core themes which emerged from the findings will be discussed and reviewed in terms of how they relate to previous studies, and will provide a view for each side of the research question itself, i.e. the ability of technology to act as a coping mechanism to difficult life experiences, as well as its inability. The limitations of the present study will then be discussed, and the possibilities of future research following this study will be explored.

Ability of technology to act as a support mechanism

Most people would agree that having technology during this pandemic is preferable over having no contact with others. If the internet suddenly stopped working, either due to network issues or overuse, the consequences would be immense [31]. Having technology and access to the internet allowed people to stay connected, continue doing their jobs, and feel entertained to some extent. In fact, it can be argued that technology has supported **three of** Maslow’s five hierarchy of needs [53]: psychological (belongingness and feelings of accomplishment) and self-fulfilment needs (achieving one’s full potential), through the ability to remain connected, work and partake in leisure time. It can even be claimed that technology supported some people, to an extent, with **two** of the most basic needs: physiological (e.g. food, shelter) and safety (e.g. financial security), given a shift to online shopping for groceries, and the ability to continue working remotely.

Focusing on technology’s coping ability mentioned by the study’s participants, the coping mechanisms outlined by Folkman and Moskowitz [9] are applicable to our results. For example, the ‘adapting technology to fit needs’ sub-theme, is a direct form of problem-focused coping, which aims to directly address the issue causing distress. Participants found new ways to use technology to fit their unmet needs – as participant N35 used a projector to replace the experience of going to the cinema, or N5 using Google Earth to experience travelling virtually. However, these represent make-shift strategies, specific to participants’ imagination, adaptability and tech-literacy. Thus, it should be noted that those who are less tech-savvy may be left out of this process.

Another major coping strategy that technology enabled was escapism, nostalgia and an ability for participants to detach themselves from reality. Folkman and Moskowitz’s emotion-focused [9] coping, which targets reducing negative associations, is relevant here. Using technology such as TV shows and films were often used as a form of distraction, or nostalgia, in line with Gammon & Ramshaw’s [27] description of nostalgia-based coping. Games have been used, in line with Iacovides & Mekler’s [7] exploration of the role of gaming during difficult life experiences, specifically as an opportunity to connect others and reduce feelings of isolation, via light social gaming platforms such as Houseparty, which were used by people who had never played games before. Additionally, the use of music, as a method to experience nostalgia was evident in both the results and literature [27]. As N1 put it, *“I’m transported back to that place immediately... music is definitely one way of basically just daydreaming about being outside and travelling to all those places that I want to”*. This is also in line with Wadley et al.’s [11] work on music being a method of emotion regulation, enabling some people to reach their desired affective states during challenging times. This coping strategy was enabled with the use of music streaming platforms, such as Spotify, Apple Music, or Youtube. n=2

participants also mentioned that creating music, e.g. by playing the electronic keyboard, provided a similar feeling of 'daydream' and 'escapism'.

As participants reported having extra time during the lockdown, mainly because of a lack of commute and fewer social events to go to, they were grateful to have technology to allow them to partake in more leisure activities. People resorted to online streaming services such as Netflix, Youtube, or playing games – the things they knew well. The availability of technology during this new-found time also enabled participants to try new habits - online courses, yoga, games, new technologies. The availability of technology also allowed participants to continue existing habits they used to take part in outside of their homes. For example, participant N4 was grateful that she could continue her exercise classes using Zoom. *"I think the thing that I can do this online is really important as well. Because probably if I wouldn't have been able to use technology, I wouldn't have been able to motivate myself every day."* Participant N18 was able to continue her pub quiz nights on Zoom, and was in fact able to take part in more online events because of an increase in time and fewer evening commitments. Such technology-related activities kept them busy and distracted, which is often the feeling they were trying to achieve in order to cope and feel elements of normalcy. N=3 participants also mentioned that they were grateful that they could do their grocery shopping online, as there were several queues and some people couldn't access the stores during the lockdown. However, this was not the case for everyone, and inability to book slots for deliveries caused more frustration, as websites such as Ocado went down and placed people in virtual queues [54]. Also, a few people were using apps such as Visualping [55] to get ahead of online queues to book slots. Those who were not as tech-savvy were unable to get ahead and book a slot, leaving some people behind.

A challenging emotion commonly felt during this time was a feeling of helplessness. Participants did not feel that they had any control over the events around them. Technology enabled a few participants feel some sense of control, even in simple ways such as selecting TV content or music. Participant N20 explained that taking part in a 'Twitter argument' and being heard made him feel better. *"It became a little bit of satisfying diffusion of the emotion."* This kind of a response is in line with the literature highlighting feelings of control as a coping mechanism [52].

Staying connected with others during this time was the most commonly mentioned coping mechanism. This was in various forms, such as video calls or regular catch ups, as well as using social media such as Instagram, Twitter or Reddit, where participants were able to share their experiences and relate to others, reminding them that they are 'not alone'. Studies have carefully studied the effects of social connection on coping ability [16,17,18], and Folkman and Moskowitz's meaning focused [9] element of coping,

where cognitive strategies are actively used to attempt for meaning-making, also include a social factor of other people providing potential emotional support. Gratitude for the ability to stay connected was also mentioned, as participants had the chance to use this time to reflect – again, assigning a form of meaning to this time.

The inability of technology to act as a support mechanism

Despite the acknowledgement that it is only technology that has allowed us to continue living our lives, several participants have found this need to use technology across almost all aspects of their life challenging. While several governments and corporations are viewing the ability to stay productive a success, claiming this "forced experiment" has in fact worked, it is evident that several participants have merely survived, not thrived.

The fact that the results indicated that there was a high number of people who actively sought non-technology specific activities, such as reading a physical book as opposed to a Kindle, meditating without any apps, or walking outside while leaving their devices behind, shows that technology has been overwhelming for some. Some participants actively sought a 'digital detox'. Studies in the digital detox space find that people seek technology-free experiences as a result of technology fatigue and to relieve stress [63]. These sentiments indicate that technology cannot always act as a coping mechanism, especially when it is already being used for most of our other activities throughout the day. Linked to this lockdown-related increased use of technology is the issue of screen time. Participants reported issues of eye strain, fatigue, but felt they were not control and had no choice as they had to use technology, especially for work purposes. This links with more recent studies of the impact of screen time on mental health during COVID-19 [60], reporting that those using screens for over 10hrs/day were more likely to experience depressive symptoms. This has serious implications with regards to supporting people with managing any personal consequences as a result of this increase in screen time.

A major challenge quoted was the dilemma of wanting to stay well informed, but not be overwhelmed by the amount of news available around the pandemic. Participants felt "overwhelmed" and that the flow of news was "never ending". The spread of fake news was another major concern. Depoux et al. [51] states that the "social media panic travelled faster than the COVID-19 spread." The term "infodemic" was coined by the World Health Organisation, who had in fact tweeted false information regarding the pandemic in January, stating that the virus was not contagious [32]. With this plethora of information and uncertainty about what is true, even with valid and paid sources, a high amount of anxiety, fear and confusion arose. This created a strong need to detect and respond to this news

– new platforms such as logically.ai [56] have been created to combat such issues and identify fake news. While such platforms are new and currently small scale, they could be a potential solution to supporting people with identifying trustworthy information. During the heart of the pandemic, Whatsapp worked with the WHO and decided to limit the ability for its users to forward messages, in an attempt to curb the spread of misinformation [64]. Measures taken by such mainstream social communication platforms can aid this cause as well.

Frustration with broadband issues were mentioned several times. Many had to switch to remote working and leisure, which included streaming, leading to significant increases in internet usage [2]. This often resulted in weaker broadband and connection issues, meaning video calls were frequently disrupted and streaming services lagged. As a result of this, a feeling of lack of control was mentioned again, as participants felt they could not partake fully in the activities they wanted when connection issues arose. Referring back to the literature on negativity bias [57], where negative information weighs more heavily in the brain, the frustration with Wi-Fi issues affected participants strongly, while a lack of issues or smooth connectivity was never positively acknowledged. Nevertheless, with more activities turning digital, it is evident that the infrastructure needs to be able support this increase.

Another challenge which technology contributed to was **productivity guilt**. While it is in some sense paradoxical, as access to technology enables people to work and be productive, it also contributes to feelings of guilt when participants are being in some sense unproductive. In terms of work, participants felt that they always need to be “on” and available, and try to overcompensate productivity, which was in line with previous literature highlighting the challenges of working from home [21]. As participant N1 put it, *I keep thinking that my boss is thinking that I'm not working .. I'm just probably overcompensating for working from home.*” Linked to this is the issue of the inability to detach from work. As noted in previous literature [44], it can be challenging to detach from work in a home environment, especially if the same devices are used for work and non-work purposes, which was the case for the majority of the participants. Ideally participants would separate home and work boundaries, but this was especially difficult during the pandemic when entire households were at home. This calls for a need for further support in enabling home/work boundaries for people working from home during this time and in the future.

In terms of leisure time, several participants described that while they were participating in ‘non-productive activities’, such as watching online content, playing games, or using social media, they felt a duty to be productive and subsequently felt guilty. They did however admit that these activities help them cope and contribute to the ‘escapism’ process that some seeked. This links back to Wadley’s [13]

argument for digital emotion regulation, and Iacovides & Mekler’s [7] findings of games acting providing essential respite, where these activities can still be deemed productive as they act as an emotional support mechanism. It should also be noted that some forms of leisure technology did support participants with feeling productive in the conventional sense, such as by doing online courses, or listening to podcasts instead of music.

These mixed experiences with productivity can bring us to question what productivity really means. In the most common context, productivity is associated with work and completing tasks. In a Digital Emotion Regulation context, productivity can be associated with dealing with our emotions successfully. After studying employees’ experiences of working from home during this pandemic, Jaiswal and Arun [28] found that moments of ‘undisturbed time to think about things’ had led to sparks of creativity. While this can be deemed as inefficient, instances of such inefficiencies can in fact contribute to our well-being and creativity. If employers are able to set fair expectations of what entails productivity, keeping in mind the emotional needs of people at this time, this can help with coping with some of the anxiety created by working from home.

A final challenge was the **inability to create authentic conversations and experiences online**. While there was a widespread appreciation for our ability to remain connected, participants often felt that many of the conversations they were having felt inauthentic and sometimes forced. This was especially common in work contexts, which is also in line with previous literature, where there was an acknowledgement that some experiences just cannot be re-created, and some work socials seemed “awkward or performative” [44]. Some participants described that even in personal contexts, some catch ups felt ‘forced’ and ‘fake’. Another participant experienced a close friend passing away abroad, and while there was a feeling of appreciation that he was part of the funeral on Zoom, he described a feeling of helplessness when he was unable to express his grief fully and support the family by “physically being there, touching them and just being affectionate” (N32). These experiences caused some frustration and disappointment and did not contribute to the coping process. In addition, a consequence of activities turning digital is that there are missed opportunities of micro-interactions with others. This includes missed casual camaraderie, such as in a class, at the office or gym, or while travelling; spontaneous exchanges with strangers; or opportunities to meet new people. As these tend to be unplanned, they are difficult to re-create digitally, yet it is often these kinds of interactions that feel the most genuine. Exploring ways to increase this feeling of authenticity can make online experiences more enjoyable and ultimately support with coping to the digital shift.

Overall, the coping strategy results broadly align with previous literature and extend COVID-19 related literature. Research has looked at HCI and difficult life experiences, but

never in the context of a pandemic, where we are forced to use technology for almost everything. It is essential to thus understand what effect it has on us and if and how it can be re-designed to support us in better ways.

Limitations

Due to the voluntary nature of our recruitment strategy, our sample is likely to have included participants with an existing interest in reflecting on their relationship with technology. In fact, a few of the participants mentioned in interviews that this was an area of high interest to them. That said, we did attempt to reduce bias by recruiting using external sources such as Twitter, beyond the UCL Psychology subject pool, and by keeping the questions as broad as possible.

While the sample of forty participants provided a rich amount of data, the sample is unlikely to be representative of the entire UK population's experience. In order to attempt to identify a variety of experiences, the only selection criterion was that participants needed to be UK based. However, our sample did not include anybody infected by COVID-19, anybody self-isolating (who would likely have an even higher dependence on technology and stronger emotional experiences due an additional layer of confinement), or essential workers. It also needs to be acknowledged that varying circumstances, beyond the basic demographic data collected our study, such as the living status, financial status, relationship status, personality, or technological literacy of our participants could skew the results. Their coping needs would be different, and they would engage with different forms of technology. For example, if a participant is living alone and single, they may use online dating applications, while another person who is living alone but is in a long-distance relationship, may use more video communication tools such as Facetime. Understanding the potential links between these circumstances and technology-specific coping strategies could yield interesting insights.

Some participants also found the diary study itself challenging and noted that they did not feel many emotions throughout the day, and thus could not discuss coping mechanisms in detail. Some participants would also be biased when writing down their emotions, as they would be actively thinking about them throughout the day as part of the exercise, so their natural emotions may not be reflected. However, this is a wider issue with self-reporting and diary studies [59].

Finally, during the interviews, there were also sometimes network issues which cut off the flow of the conversations, and thus not all information may have been captured.

Future work and recommendations

This study has provided a closer understanding of how technology can benefit, but also hamper emotional well-being and coping mechanisms during this time. The

highlighted challenges provide opportunity to further research these areas and present possible solutions to them. These include issues of excessive screen time, feelings of helplessness, managing misinformation and fake news, improving work / home and physical / digital boundaries, productivity guilt, online authenticity, and bandwidth connectivity limitations. The goal of enabling greater inclusivity digitally is also key. This goal is two-fold: firstly, including older generations and those with limited access to technology. Secondly, while some are slowly transitioning back to offices, it is necessary to include those who need to stay at home to work, perhaps due to increased risk of infection or care responsibilities, and ensure they do not feel isolated from the rest of their team. This is a new area which can be further researched.

Future work could also explore certain types of participants with varying circumstances, such as the categories mentioned in the limitations. The data started revealing initial trends, such as those who fall under the younger age bracket tended to provide more examples of adapting technology to fit their needs, while those in an older age bracket often shared experiences regarding challenges with getting used to transition to digital. Trends of those living alone versus living with others started emerging, where those living alone had a more positive affinity towards technology as it enabled them to stay connected, while those who lived in bigger groups often appreciated time away from technology and spending time in-person with their flatmates. However, they also often reported more issues with broadband connectivity. Understanding nuances of these differences between participants would aid in generating a deeper insight into their experiences, and understand why certain people turn to specific technologies. Using other methods such as quantitative research could also enable a larger sample to be captured. Additionally, having clearer 'success' measures or indicators of the effects technology on our well-being could further enhance our understanding of the impacts of technology and what can be done to improve.

Another interesting area to explore would be design-specific solutions to the future of learning or working, keeping in mind the knowledge of people's experience of this pandemic explored in this paper. Some designs are already being tested out, such as Microsoft's case studies featuring the designs for the future of post-COVID experiential learning environments [34].

There are important policy consequences following this analysis, from both a government and corporate view. There is a clear need for mental health and policy support, as well as further support in enabling detachment from work, such as facilitating a physical separation. It is very likely that the future of work will be a hybrid model, with a mix of office and work from home. A few organisations have started working on this following discussions with employees working from home. Microsoft's software engineers, for

instance, mentioned challenges related to an overwhelming amount of meetings during this time, and thus announcing ‘no meeting Fridays’ [33]. Such actions, even though they may seem incremental, make a difference to the employee experience of working from home. Further research strengthening the argument for these interventions is essential.

Finally, as the pandemic is still ongoing, future work could provide a more well-balanced view of the focus of this paper, once more data and literature is available.

6. CONCLUSION

Being confined indoors has almost forced the use of technology in order to maintain some semblance of normalcy, to maintain daily activities and feel included in society. The aim of this paper was to gain an understanding of the role technology played on our ability to cope during the lockdown. This was conducted through an investigation of how people in the UK were impacted by the lockdown and understanding how they used various forms of technology to cope with pandemic-related challenges. We identified and presented a number of challenges created by technology, as well as positive enablers and coping strategies.

From previous work, we were able to derive an understanding of how people cope during difficult life experiences, and how they use technology specific solutions, however, this was not studied in a lockdown context. This paper contributes towards expanding the context in which technology-related coping mechanisms are studied, and has given a base for understanding people’s experiences during the height of the lockdown. However, future research also could further deepen the understanding of each mentioned challenge, explore variations in experiences based on participant circumstances, or define ‘success’ measures or indicators of the effects technology on our well-being.

While this lockdown can be considered an extreme case, there is no doubt that the future of work, socialising and leisure will not be returning to its pre-pandemic state. COVID-19 has accelerated an already fast-moving adoption of digital technologies, creating lasting effects with regards to our technology use. There are serious consequences resulting from decisions made by public health, the government and organisations during lockdown. If another lockdown does happen, the findings from this paper and other relevant literature could potentially aid researchers, designers and policy-makers in understanding how people act in these situations, and what their coping strategies and needs are during this time of heightened emotions. While technology cannot single-handedly solve all issues, it can to some extent mitigate the effects of this pandemic. At the same time, technology as it is cannot replace and re-create all physical experiences, and expectations need to be set for this. It is evident that there is a need for academia, the public sector and corporate entities to work in tandem in order to

address these challenges, educate the public, and implement supportive legislation.

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APPENDIX

The appendix contains the topic guide which was used for the semi-structured Interviews 1 and 2.

Interview 1 Topic guide

- Explain the research
- Describe what an emotional event is
- Describe what could be considered technology use in response to those events
- Provide examples – e.g. I was frustrated about something at work and so I used a meditation app; I was anxious about something I saw on the news about lockdown and so watched a TV show to distract myself
- Explain how the ‘diary study’ will work; see diary section below
- Explain what will be expected of them in the final interview
- Ask the participant to provide an example to make sure they have understood what we are after
 - What’s an example of an emotional event they encounter in their daily life?
 - What are common ups and downs, emotionally, in their day to day life?

- What do they do in response to those events? (does not have to be limited to technology for the sake of this exercise)

Diary

- Let participants do it themselves, we don't see it
- Ask them to take note and reflect on their use of digital technology (most likely, their phone and computer, but also tablets, game consoles, etc.) during or following emotional events during this lockdown
 - If there are any technologies they use more than others, take note of this too
- Ideally have min. 5 examples ready for when we talk next, which we can talk about in depth
 - We will ask about the context (where you were and what was happening), the type of emotions they experienced, and the ways in which they used technology, and whether that affected how they were feeling
 - Tip - some people find easier to remember specific events by taking a photograph as a reminder of the event and the context, taking a screenshot of the phone, using screen time as a reminder of the kind of technology used
 - The medium is up to the participant - can take notes with a paper and pen, on phone/laptop – whatever is easiest to jog their memory of few examples to talk about in some depth
- Did you use any other techniques or do anything else at the same time? (e.g. listen to music while playing the game, etc...)
- Why did you stop the activity?
- Do you know if other people use this technique? Is it something you've seen other people use before? Do you discuss it with people you know?
- Would you recommend that technique to others?
- Do you think there are any drawbacks to using this technique, or do you have any concerns about using it?
- Are there any techniques that you used in the past but don't anymore?
- Do you think emotions influence your tech use, or vice versa: tech use influencing your emotions (e.g. bad network connectivity making you frustrated)
- Have you noticed a change in your emotional responses / the technology you use as a result of them because of COVID-19?
- Do you have any other comments regarding your lockdown experience in relation to your technology use? Do you feel more grateful or disrupted with technology use during this time?
- Have you had moments when you wanted to get away from technology?
- Do you feel your attitude / relationship with technology has changed during this time?
- Any other comments / thoughts

Interview 2 Topic guide

Ask the participant to talk about the specific events they noticed during the week:

- What were you feeling?
- What caused those feelings?
- Bringing them back: What were you doing? Where were you? Who with?
- How did you respond/cope with this feeling? What technology did you use? (asking for details e.g. what video, what music, what game, etc...) How long did you use it for?
- How did you choose the music/video/game/etc... in particular? Do you have specific, go-to pieces of content that you go back to in certain circumstances (e.g. playlists)?
- What was the effect on your emotional state?
- To what extent were you conscious of using it to regulate your emotions?
- Is this something you would typically do or was it a one-off, rare occasion?
- When did you learn/start doing that? How? Do you use it in any other contexts?