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Digging into “Zoom Fatigue”: A Qualitative Exploration of Remote Work Challenges and Virtual Meeting Stressors

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Abstract: Purpose: With the onset of the COVID-19 pandemic, employees suddenly had to work remotely and realize all work-related social interaction in virtual formats. The sudden shift to the virtual format came with new workplace stressors. To understand the stressors of remote work and videoconferences, we present two qualitative studies. The aim of this study is to better understand the stress associated with remote work and videoconferencing, with an emphasis on how workers cope with the added stress. Methodology: We applied thematic analysis to open-ended survey data from employees in the US ($n = 349$) and in-depth telephone interviews of 50 meeting leaders from the US and Germany. Findings: We identified the work-home interface, technology, and communication issues as key challenges of remote work. Further, we found camera usage, early meeting phases, and multitasking to be central stressors of videoconferences. Finally, we identified individual- and team-level coping strategies to reduce the impacts of virtual meeting stressors on employees. Originality: Our research contributes to the emerging field studying the effects of virtual work and videoconferences on employees. We provide an overview of the challenges of remote work at the early stages of the pandemic, and we present an overview of the stressors that emerge in virtual meeting environments. We discuss insights into why videoconferences may fatigue employees. Including German and US samples, our research allows a cross-cultural comparison of videoconferencing stressors. Finally, we present actionable practical recommendations to improve videoconferences.

Keywords: remote work; videoconferences; virtual meetings; meeting management



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1. Introduction to Zoom Fatigue

The COVID-19 pandemic revolutionized the working world, with a sudden shift to remote work across the globe. Accompanying the change, workplace meetings had to be transferred to one of various videoconferencing solutions, such as Zoom, MS Teams, or Google Meet. For example, Zoom went from hosting 10 million meetings per day in December 2019 to 300 million meetings per day in April 2020, a trend that continued during 2021 [1]. At the same time, a major problem emerged with all these meetings. Employees started to report symptoms of exhaustion from them [2], colloquially called Zoom fatigue (e.g., [3,4]). Zoom fatigue or videoconferencing fatigue refers to the extent to which people experience exhaustion that is directly linked to their participation in videoconferences [5]. Since remote working is here to stay and will continue to be the mode of choice for many employees [6], the challenges of virtual meetings will remain relevant issues of work, even beyond the COVID-19 pandemic.

Despite a great amount of media attention concerning the Zoom fatigue phenomenon, the scientific understanding of why remote work and videoconferences are particularly stressful is just beginning to emerge, given the novelty of remote work policies for broad groups of employees. From recent research, we know that the sudden shift to remote work

came with specific key challenges, such as ineffective communication and loneliness [7]. Additionally, initial empirical evidence showed that virtual meetings trigger specific fatigue symptoms that are not explainable by other typical workday routines [5,8] or by a generally increased meeting load (i.e., frequency and duration [8]). In terms of virtual meeting stressors that may be particularly demanding, scholars have pointed to the role of camera usage [5,9], technical problems [5,8], distractions [5], and less informal communication [5,10], as well as experiences of loss and comparison to the “good old times” [8]. Theoretical papers discuss continuous alertness [11] and cognitive overload [3,12] as possible stressors of videoconferences that are associated with videoconferencing fatigue. What we do not know is the degree to which individuals actually perceive and experience these stressors.

When studying new and complex phenomena, qualitative study designs are particularly beneficial [13]. To date, we have a small but growing empirical research space in the area of remote work and videoconferencing stressors that affect employees. The present paper joins the line of research by Bennett et al. [5], Shoshan and Wehrt [8], and Wang et al. [7] by investigating remote work as well as stressors of virtual meetings from a qualitative perspective. We aim to move the conversation regarding remote work and virtual meetings “upstream” to the root causes of possible fatiguing effects. The purpose of our studies is to identify stressors of remote work and videoconferences, and, additionally, to examine why they are impairing employees. Further, we seek to understand current attempts to cope with and manage the stress caused by these remote work activities.

To this end, we applied a root cause analysis and conducted two qualitative studies using a surface-level approach (Study 1) followed by a deep-level approach (Study 2). Study 1 was conducted among US employees suddenly thrust into remote work in the spring of 2020. This first study followed a broad approach to discover challenges that these workers encountered. Study 2 was conducted more than a year later, after employees had had time to adapt to the new normal of work [14,15], and includes leaders of videoconferences from the US and Germany. This allowed us to explore potential cultural differences in a virtual meeting context. The inclusion of these two particular cultural settings was inspired by previous research on face-to-face meeting interactions, which found distinct differences in the behavioral patterns that emerge in meetings in Germany and the US, respectively [16]. Furthermore, Study 2 was designed to generate novel insights by focusing on meeting leaders’ experiences in videoconferences rather than those of regular attendees, as investigated in prior research.

Our research contributes to the emerging field studying the effects of virtual work and videoconferences on employees in five important ways. First, we provide an overview of the challenges of remote work and virtual meetings at the early stages of the pandemic. Second, we present an overview of stressors that emerge in virtual meeting environments. Third, we discuss initial insights into why characteristics of virtual meetings may affect employees. Fourth, we present a cross-cultural comparison of virtual meeting stressors between German and American samples. Finally, we equip meeting leaders with actionable practical recommendations to improve their virtual meetings.

2. Remote Work and Virtual Meetings as Job Demands

In remote work (also called telework, work from home, or home office), workplaces are located in various locations beyond the central offices or production facilities of a company, and workers communicate using technology [17]. Traditionally, remote work has been a privilege of higher-income earners and white-collar workers [18], and, thus, was not a commonly used practice [19]. With the outbreak of the COVID-19 pandemic in the spring of 2020, however, remote work became a necessary part of many workers’ daily lives [20]. Current trends show that remote work is here to stay, with the majority of employees reporting wanting to continue working remotely or in hybrid models with both in-office and remote workdays [6].

As a central characteristic of modern organizations, teamwork shapes the organizational workflow and provides the key organizing principle for achieving coordination and

collaboration. Therefore, the sudden shift to remote work included a rapid increase in virtual collaboration to keep up the team-structured work. In coordinating work, maintaining relationships, and ensuring organizational functioning, team meetings play an important role (cf. [21]). Indeed, as of December 2021, employees attend between 11–15 meetings per week [22]. Given the ongoing remote work practices for many employees, many or all of these meetings take place virtually. Given the prevalence of teamwork in modern organizations, it is particularly relevant to examine the effects of remote work and virtual meetings on employees in team contexts.

Research on face-to-face team meetings has shown that those meetings affect employee experiences. For example, the sheer number of daily meetings was found to affect employee well-being (e.g., [23]). As any meeting interrupts the workflow and consumes valuable work time, the mere existence of a meeting can become a workplace stressor [24]. Face-to-face meetings tend to generally have a bad reputation, with employees often perceiving them as ineffective, which affects how they feel at the end of the day as well as their general job satisfaction [23]. However, there is no established and clearly outlined construct, such as face-to-face meeting fatigue, as there is for videoconferencing fatigue.

The concept of fatigue itself originated in physiology, where it is understood as a decline in performance due to preceding physical exertion [25]. Mental fatigue is a psychophysiological change or “suboptimal psychophysiological state or condition” [26] due to sustained effort while performing a task [27]. Any activity that requires continuous exertion can be fatiguing, including the widespread practice of virtual meetings. Workplace fatigue has been a well-known phenomenon in organizational research for decades, and can either fluctuate over time depending on workplace factors or become a stable experience [28]. Task disengagement or impaired performance on cognitive tasks are possible consequences of workplace fatigue [29], which is why workplace fatigue can be a serious threat to employees’ health and safety [30]. Fatigue from virtual meetings has been established as a relevant fatigue phenomenon on its own [5,8].

One characteristic of virtual meetings that has been identified as particularly stressful is camera usage [5,9]. Theoretical discussions assume an increased cognitive load when being on camera as a central reason for feeling drained after videoconferences [12]. Both signal senders (i.e., the person who is speaking) and signal receivers (i.e., all other participants of the meeting) are expected to make an extra effort to send and receive nonverbal signals. Empirical findings showed that camera usage in virtual meetings comes with increased resource costs due to self-presentation, which refers to the feeling of having to manage the impression one is making on others [9].

Nevertheless, employees during the pandemic were not exclusively affected by virtual meeting experiences, but also by other factors that came with the shift to mainly remote work and other COVID-19-related life changes outside of work. For example, masking and social distancing, as well as the need to conduct homeschooling due to closed schools and childcare institutions, can also affect employees [31]. Additional challenges of remote work, such as procrastination [32] and a lack of social support from co-workers and supervisors [33], may also strain employees. To untangle the relevance of general remote work challenges and stressors of virtual meetings for employees, we decided to conduct a two-study approach. The goal of Study 1 was to explore the general stressors employees experienced in the early stages after rapidly shifting to remote work. Study 2 built on these findings and examined the stressors of virtual meetings more specifically.

We based both studies on the Job Demand-Resources Model (JD-R) by Bakker and Demerouti [34], which describes demand–strain relationships as well as resources. In general, this model postulates that high job demands cause exhaustion and low resources reduce work engagement. Job demands are aspects of the job that require effort and result in a depletion of energy. Against the background of this model, stressors of remote work, as well as stressors of virtual meetings, can be classified as job demands that, if not moderated or mediated by resources, increase employee strain. The JD-R model provides a useful framework for understanding workplace stressors’ impacts on employees.

3. Study 1: Challenges and Opportunities of Virtual Work

The COVID-19 pandemic thrust the known phenomenon of remote working overnight upon billions of people [7] who were not necessarily equipped to handle the sudden shift. Employees were facing completely new demands they had not experienced before. Their physical work situation changed drastically, for example. Some employees may not even have had a chance to set up an office at home with the comforts they were used to in their offices, such as external screens or ergonomic chairs [35]. Given the increasing digitalization of most workplaces even prior to the pandemic, working virtually while being co-located with colleagues was something employees were already used to [7]. The main change with the onset of the pandemic was that employees were not working co-located anymore and were suddenly distributed across many different locations. The new situation further required moving all work functions to the virtual context, which included turning face-to-face meetings into videoconferences. This meant that no form of face-to-face collaboration was possible, and resulted in a dramatic increase in the number of daily virtual meetings [14].

To gain an overview of the complex and novel situation that the sudden shift to virtual work brought, qualitative research is a useful approach. In order to investigate the challenges of remote work in a timely manner and to reach a large sample in order to obtain representative insights, we decided to use open-ended questions in an online survey. This method has already been used by other influential studies in the field of videoconferencing fatigue research (cf. [5,8,9]). Using open-ended questions in an online survey is an economical way to get a quick first overview, but the method has limitations when it comes to depth of detail, as situation-specific follow-up questions are not possible. As our main goal of Study 1 was to reach a large sample within a short time, however, this was our approach of choice.

Study 1 explores the early reactions people had to suddenly working remotely and their experiences of virtual meetings. To do so, we took an exploratory approach to investigate the following research questions:

RQ1: What were the main challenges that employees perceived at the early stages of the pandemic?

RQ2: How do participants experience virtual work meetings at the early stages of the pandemic?

3.1. Methods Study 1

3.1.1. Sample and Procedure

Data for Study 1 were collected in August 2020 as a part of a larger survey study. The present study focused on the qualitative aspect of it. Using Amazon Mechanical Turk, we sought out working adults with diverse occupations from the US who worked full-time and usually had at least one meeting per week. Amazon Mechanical Turk is a useful and reliable tool for collecting panel data for generalizable knowledge [36]. All participants were presented with questions about their perceptions of the last meeting they had. We excluded participants who reported on meetings of over 100 people, because larger group meetings differ from smaller group meetings. Additionally, we removed participants who reported on meetings with fewer than three people, since dyadic meetings differ from team meetings in terms of ephemerality, emotion, and group phenomena [37] (see also [38]). We further excluded those whose last meeting occurred more than two weeks prior to the survey to avoid biases by recall errors [39]. After deleting incomplete data, our final dataset consisted of 349 individuals, composed of 51.6% females, with an average age of 36 (SD = 7.9) and an average organizational tenure of 6 years (SD = 5.7).

To explore people's experiences during the early days of the pandemic, questions were developed based upon qualitative interview research methods [40] and were consistent with previous research using surveys for qualitative studies [41]. The qualitative survey took about five minutes to answer and included four open-ended questions that were stated as follows: "If you are working from home due to COVID-19, please list all the obstacles

that have prevented you from effectively carrying out your job;" "If you are working from home due to COVID-19, please describe any changes you've experienced in the work you do and how you complete it;" "Please think of all the meetings you have engaged in since working from home due to COVID-19 and compare your experiences with face-to-face and virtual meetings;" and "If you are working from home due to COVID-19, think of the last virtual meeting you had and list all the challenges (if any) that emerged due to conducting the meeting online."

This study received ethical approval from the second author's Institutional Review Board. We obtained written informed consent from all participants included in the study before they answered the survey questions. To ensure participants' anonymity, we deliberately did not collect any identifying information. If any such information was provided in the answers to the open-ended questions, we removed it.

3.1.2. Data Analysis

Two raters applied thematic analyses. In a first step, both raters read independently through all responses and identified themes. Next, both raters generated initial codes, searched for themes, and reviewed their themes. The two raters then discussed, combined, and defined themes to create a mutually exclusive list of themes. In the following step, both raters coded the first 100 responses from each question independently based on the theme list. Given the high interrater agreement based on the codes for each question ($\kappa = 0.82$ for question 1 and $\kappa = 0.85$ for question 2), the remaining data were coded individually.

Next, we conducted a second-level coding process within each question. In this process, we identified themes across the first-level codes within each question and grouped them into themes to assist in interpreting the results more clearly. Following current qualitative analysis conventions, all first-level codes and associated responses were sorted and grouped into themes according to commonality between individual responses [42]. With the first-level codes sorted into the correct second-level theme, percentages of the frequencies of themes and second-level coding that were mentioned in the data were calculated.

3.2. Results of Study 1

Table 1 shows the identified themes, theme definitions, example codes, exemplary transcripts, and frequencies of themes.

Theme 1: Work–Home Interface. We identified troubles concerning the work–home interface as a first relevant theme of remote work. Codes that emerged around this topic were distractions as well as family and childcare obligations. Participants reported having difficulties remaining focused and being distracted by their pets, neighbors, or background noises. In some cases, background noises were caused by employees' families. To limit the spread of COVID-19, the closure of most daycares, schools, and other social institutions was unavoidable. This left many employees with the challenge of managing other duties that were previously outsourced, such as educating their children or caring for dependents, in addition to their day-to-day work. Participants explained having to complete housework or homeschooling, which prevented them from working to their fullest.

Theme 2: Technology Issues. Another central topic we discovered concerned the technological issues that appeared when working from home at the beginning of COVID-19-caused remote work policies in the spring of 2020. Technology-related issues included problems with connectivity (e.g., internet connection issues, delays in data uploads), hardware issues (e.g., a lack of appropriate equipment, a lack of knowledge of how to use the equipment), and software issues (e.g., access issues, data sharing issues).

Theme 3: Communication Issues. Communication issues emerged as our third relevant theme. This theme included experiences of videoconferences as being less productive than face-to-face meetings. Participants stated that they perceived a lack of engagement, focus, motivation, support, and social interaction in their virtual meetings. Further, we found that communication in virtual contexts was perceived as less natural. Having difficulties interacting with co-workers due to missing social cues, a lack of immediate feedback, and

less flexibility contributed to experiencing videoconferences as less natural. Interruptions of the communication flow were also identified as relevant communication issues.

Table 1. Themes and Codes Identified from Study 1: Challenges of Remote Work and Virtual Meetings.

| Theme | Definition | Example Codes | Exemplary Transcripts | Frequencies |
|----------------------|--|--|---|-----------------|
| Work-home interface | Blurring of the lines between work and private life | Distractions, family, and childcare obligations | “Home noise.” “Things that my child needs during the day prevent me from working my fullest.” | 123 (35.24%) |
| Technology issues | Technology-related aspects, including hardware and/or software equipment | Hardware issues, software issues, connection issues | “No webcam/mic so I have to type my questions, which often are ignored.” “Having everyone understand how to use the software and be on time to conduct the meeting has been a challenge.” “My wifi cutting out so my colleague could not hear me.” | 255 (73.07%) |
| Communication issues | Act of conveying meanings from one entity or group to another using mutually understood signs, symbols, and semiotic rules | Interrupted flow of communication, less natural communication, less productivity | “Everyone wants to talk at the same time.” “It was hard to rely on social cues to tell when different people are going to talk, so there were many interruptions.” “Physical meetings (face to face) are generally more productive than virtual meetings” | 120.83 (34.62%) |

4. Study 2: Contributors to Videoconferencing Fatigue

The COVID-19 pandemic occurred in multiple waves and even continues to keep the world busy, so remote work regulations have persisted for longer than initially expected. In the meantime, many well-known organizations such as Airbnb and PwC have integrated permanent remote work options into their general working policies [43]. In addition, while remote work gradually morphs into the new normal for many, employees feel increasingly fatigued by the regularly necessary events of videoconferencing (e.g., [3]). Videoconferences per se are similar to face-to-face team meetings, with the important difference that they take place in a virtual context and are facilitated by videoconferencing software. Both videoconferences and face-to-face meetings are typically led by a meeting moderator and have a specific purpose (e.g., problem-solving [10,44]). Face-to-face meetings are usually scheduled in advance and come with an agenda, as do many virtual meetings. A difference regarding virtual meetings is that, in addition to scheduled and well-prepared virtual meetings, many videoconferences take place with no or short notice in advance, and without preparation of a detailed agenda. This happens when they are used to compensate for spontaneous gatherings, such as unplanned and informal social interactions [10]. Given that videoconferences come with specific characteristics that are different from face-to-face meeting characteristics, we assume them to come with different stressors.

After employees had some time to adapt to their increased videoconference load [14,15], one year after Study 1, we investigated employees' experiences of virtual meetings to understand what stressors they were perceiving in videoconferences. To identify stressors of virtual meetings and understand why they were stressful, Study 2 focused on the virtual meeting experiences of meeting leaders. A focus on meeting leaders provides important insights for two reasons. First, they are the ones facing the highest virtual meeting loads, and, thus, are being confronted with virtual meeting stressors particularly frequently [45]. Second, they have the possibility to reduce virtual meeting stressors, as they are responsible for meeting preparation, execution (i.e., meeting moderation), and follow-up [46]. The following research questions guided our efforts in Study 2:

RQ3: What stressors do meeting leaders perceive in videoconferences?

RQ4: How do leaders and their teams cope with stressors of videoconferences?

4.1. Methods Study 2

4.1.1. Sample and Procedure

Participants were recruited through the personal networks of the author team and student assistants, as well as through a snowball technique, where we asked interviewees to name other potential participants. We decided to rely on the snowball approach, as our inclusion criteria were more specific and we were interested in well-being, which can be a sensitive topic [47]. To be included in the study, participants had to (1) work either in Germany or the US, and (2) consider themselves meeting leaders who (3) led a minimum of one internal virtual meeting per week (to avoid recall errors) [39] with (4) at least three participants, including themselves. We did not have to apply an upper-level cut-off because none of our participants reported meetings with more than 100 participants, with 80 participants being the largest reported meeting. Our final sample consisted of 50 virtual meeting leaders, 30 of whom worked in Germany (15 female and 15 male) and 20 (14 female and 6 male) of whom worked in the US. The average age was 39 years for the meeting leaders in Germany (SD = 11.7) and 45 years (SD = 12.7) for the US participants. German participants reported an average of 7 participants per meeting (SD = 3.48) and a mean of 12 meetings per week (SD = 9.64). In the US sample, participants reported a mean of 13 participants in their regular meetings (SD = 19.2) and an average of 16 meetings per week (SD = 10.1). The interviewed meeting leaders mentioned using a wide range of different software solutions to conduct their videoconferences, including popular solutions such as Zoom, Microsoft Teams, or WebEx.

Data for Study 2 were collected from March 2021 to June 2021 through semi-structured interviews with an average duration of 30 min and an accompanying survey that took approximately 5 min. Interviews were conducted by the first author and three student assistants via telephone or an online videoconference platform using audio only. All interviews were audio-recorded and later transcribed. The interview questions were open-ended and neutral. The guideline was broadly divided into four main sections with 27 more detailed sub-questions that focused on the following topics: (1) the current work situation, (2) changes in meetings during the pandemic, (3) characteristics of good and bad virtual meetings, and (4) participants' well-being. The interview protocol can be found online in the Supplementary Materials. The accompanying survey covered general information on demographic data, position, time spent in current employment, meeting frequencies, and the size of the meetings.

Written informed consent, as well as verbal consent for recording the interviews, was obtained from all participants before the interview and survey. Participation was voluntary and could be aborted at any time, and all data were processed anonymously. Participants were offered the opportunity to receive the results of the study as compensation for their time. This procedure of the study was approved by the Local Ethical Committee at the first author's institution.

4.1.2. Data Analysis

Based on the interview transcripts, we developed a coding system according to the principles of thematic analysis (e.g., [48]) and used the software MAXQDA [49] to conduct our analyses. As a first step, the first author and the three student assistants, who also conducted the interviews and were familiar with the research question, familiarized themselves with the data transcripts, which involved multiple rounds of reading and re-reading transcripts. In a second step, the coder team systematically generated initial codes and assigned parts of the transcript to each code. Third, the four coders summarized the codes into potential themes and, in a next step, checked whether the themes and codes fit with other exemplary transcripts. Finally, the first author and the three student assistants developed a preliminary thematic coding system that included themes and sub-codes. After trying out the preliminary coding system, the coder team refined the themes and codes as needed,

then generated theme and code names, as well as definitions, and supplied each code with an exemplary segment from the transcripts (Table 2). Our final coding system consisted of seven themes, with a total of sixteen singular codes. Based on this coding scheme, the first researcher and the three student assistants independently double-coded five transcripts. The first author and the three student assistants formed two coding dyads for the purpose of establishing interrater reliability. Discrepancies were resolved by discussion within the coding dyads. Interrater agreement was substantial for both coding dyads, with $\kappa = 0.7$ and $\kappa = 0.69$ for the respective teams. After reaching this level of agreement, all raters coded the transcripts independently.

Table 2. Themes and Codes Identified from Study 2: Stressors Concerning Videoconferences and Coping Strategies.

| | Theme | Definition | Example Codes | Exemplary Transcripts | Frequencies |
|-------------------|------------------------------------|--|---|--|-------------|
| Stressors | Camera usage | Utilization of the camera in videoconferences | Camera usage preventing VCF Norms for camera usage | “And, I mean, it is nice to see smiling faces every now and then.” “I let my team know, like, my expectation is, when we have a meeting, that they are going to be present on video.” | 41 (82%) |
| | Early meeting phases | Pre-meeting or early meeting interactions (e.g., small talk) | Informal communication preparation | “[In] Face-to-face meetings we would kinda sit around and talk, you know, ‘How’s life? [...]’. When we would have these meetings, we’d bring them up in the same room, so we could all talk. Since then, it’s been less of that, just because of the time constraints, of trying to get these meetings off on time and getting to the next meeting for myself. There’s less of that interaction.” “What has changed in terms of content is that suddenly there was a lot more desire for structure, so we also tried to keep the physical meetings with a certain structure, but that sometimes got out of hand. And with the online meetings, everyone is very concerned that it always has a certain structure.” | 44 (88%) |
| | Multitasking | Switching back and forth between different work tasks in relatively short time | Work-related multitasking Private multitasking Evaluation of multitasking | “I definitely will send e-mails. I always usually during the day have a to-do list of like e-mails I need to send or things that I need to do, so I’ll sometimes have that pulled up on the side.” “If somebody sent me a text, I usually answer the text.” “If you do other things multitasking, I think you are missing out of the meeting.” | 35 (70%) |
| Coping strategies | Individual-level coping strategies | Coping strategies that are applied individually to cope with stressors of videoconferences | Breaks Reducing screen time Camera equipment | “I try to build breaks into our day, especially with long virtual meetings you just need it mentally.” “So, you just have to train yourself to look out of the window from time to time, away from the computer.” | 31 (62%) |
| | Team-level coping strategies | Coping strategies that are applied together as a team to cope with stressors of videoconferences | Creating room for informal communication Digital tools | “We compensate for this social aspect with our coffee calls, whether in the morning or in the afternoon.” “And so, I saw as a team, we’re continuously looking at ways we can leverage the tools better and the tools are evolving as well.” | 34 (34%) |

4.2. Results of Study 2

Table 2 shows identified themes, second-level codes, and exemplary quotes as well as frequencies of Study 2’s results.

Theme 1: Camera usage. Most virtual meeting platforms enable attendees to use an integrated or external webcam, but this often remains an individual choice in the meeting. Interestingly, we found that it was perceived as stressful by participants when cameras were not used in a virtual meeting. Meeting leaders reported that using the camera is

pivotal for the experience of a good virtual meeting. They explained that turning on the camera and seeing each others' faces in a meeting helped them to feel more connected and to have a more natural social interaction compared to using audio only. Meeting leaders also reported that they require visual cues to improve non-verbal communication, as the video frame allows them to see team members' facial expressions, body posture, and hand movements. Additionally, interviewees explained that throughout the years of 2020–2021, norms on camera usage emerged. Some interviewees described this as a deliberate process prescribed by management, while others explained that an unwritten rule dictates when to use the camera and when not to. Generally, most team leaders mentioned that turning the camera off in large meetings or when having low bandwidth is acceptable, whereas attendees in team meetings would generally be asked to turn their video on. However, cases in which someone cannot or prefers not to turn on the camera due to privacy concerns are usually met with understanding.

Theme 2: Early meeting phases. Meeting leaders mentioned the lack of pre-meeting interaction as another stressor of video conferences. Our interview findings highlight that pre-meeting interaction phases are substantially different and more rare—or non-existent—in videoconferences. Videoconferences were generally described as more task-focused and shorter in duration, with less room for informal communication. Virtual meeting rooms typically open just prior to the meeting's scheduled start time and, therefore, preclude pre-meeting talk. Some interviewees reported that pre-meeting small talk was partially transferred to the early meeting phase and that they encouraged attendees to exchange informal information if desired. Others mentioned working through the meeting agenda without any compensation of pre-meeting informal communication. Moreover, interviewees reported that virtual meetings that were not well prepared triggered a great sense of frustration due to the waste of time. They explained that it would have been less frustrating in a face-to-face setting because they could have still used that meeting to chat and exchange information on other, possibly non-work-related topics.

Theme 3: Multitasking. We identified both work-related and private multitasking, which refers to switching back and forth between different work tasks in a relatively short time [50] as crucial stressors of videoconferences. Multitasking was more likely to occur in larger meetings, when the cameras are turned off and when participants have the feeling that the discussed content is irrelevant to them. Reading and writing e-mails were the most prominently described work-related multitasking activities, followed by organizing one's calendar or editing documents, and programming or analyzing data. Notably, fewer participants reported doing non-work-related activities while being in a virtual meeting, such as checking the phone for private messages or doing household duties. Even though interviewed meeting leaders stated that they actually engage in a fair amount of multitasking, they explained generally not liking it as it is perceived to threaten meeting quality and is an indicator of an unnecessary meeting. On the other hand, some meeting leaders mentioned that multitasking makes virtual meetings more efficient for them, because they can complete multiple tasks within one time slot that would usually be blocked exclusively for a meeting. Others multitasking was generally seen as acceptable by meeting leaders as long as it was work-related and team members were still contributing to the meeting.

Theme 4: Individual-level coping strategies. Interviewed meeting leaders described applying individual strategies to cope with the stressors of videoconferences. Interviewees reported intentionally scheduling breaks from virtual meetings to create room for movement or off-screen time. They further explained that they schedule the virtual meetings for shorter time periods than they would in face-to-face settings so as not to overload attendees or end up with back-to-back meetings. Some meeting leaders even mentioned blocking 30-min timeslots in their calendar to make sure they had enough time off from meetings to recover. Additionally, participants reported trying to reduce the time spent looking at the screen because they experienced the continuous attention on the screen as particularly stressful. They, for example, walked away from the screen when not in

a meeting or in a meeting with the camera turned off, or they looked slightly over the screen. Improving technical equipment, including audio, video, and lighting equipment, was mentioned as another individual approach to cope with virtual meeting stressors. Improving audio quality was reported to improve the flow of communication, whereas better lighting equipment was described to make participants more comfortable with their own video representation.

Theme 5: Team-level coping strategies. Team-level coping strategies are created collectively and help the team as a whole to cope with the stressors of videoconferences. To cope with the lack of informal communication, team members reported planning regular virtual after-work events on a monthly basis. To facilitate informal communication in everyday work, participants scheduled regular meetings for coffee or lunch dates without an agenda or topic, just as an occasion for non-work-related talk. Further, meeting leaders stated that they tried to have more one-on-one meetings with their team members and actively ask them about how they were doing outside of work as well. Participants reported that they started to use digital tools that were available in the meeting software to improve the team atmosphere and the structure of meetings. They mentioned utilizing different emoticons, such as clapping or a happy face, to express the emotion of being happy, or a thumbs up or hand raise icon to show their reaction to something and to avoid crosstalk throughout the meeting.

Additional findings. Interviewing meeting leaders from the US and Germany allowed us to examine cultural differences in videoconferences. Our findings indicated that meeting leaders in the US had more experience with videoconferencing than German meeting leaders prior to the pandemic. Regarding informal communication, US meeting leaders mentioned having less trouble than German meeting leaders with integrating informal talk into their virtual meetings. This may be explained by the fact that the meeting leaders from the US were already more familiar with the format and thus more experienced with making meeting attendees feel comfortable. Apart from the aforementioned differences, the experiences of US and German meeting leaders appeared similar. Table 3 provides a brief cultural comparison.

Table 3. Cultural Comparison from Study 2: Topics Where Cultural Differences Emerged.

| Topic | US Sample | German Sample |
|---|---|---|
| Previous experiences with videoconferencing | Videoconferencing was already more a part of everyday work before the pandemic due to collaboration with international teams or locally distributed teams within the US | Fewer experiences with videoconferences prior to the pandemic; German teams were usually working in the same location; in case of international collaboration, telephone conferences were applied |
| Informal communication | More confident approaches to integrate informal communication into virtual contexts, e.g., through virtual after hours or more frequent one on ones | Difficulties with integrating informal communication into the virtual context; more focus on the strong task-focus of videoconferences (i.e., perceived meetings as more efficient) |

5. General Discussion

With this paper, we contribute to a better understanding of the drastic increase in remote work, the new normal in today’s organizations, and the stressors of virtual meetings in particular, by applying qualitative approaches in two studies and probing experiences at different stages of the COVID-19 pandemic. Our findings highlight the work–home interface, technology issues, and deteriorating communication as key challenges at the beginning of the global shift to remote work. Our contribution to literature and practice

is the fact that we dig into qualitative reports from actual employees engaging in remote work. The stressors identified here are what they actually reported as the sources of their stress and difficulty with remote work, rather than what may be assumed based on indirect observation or conjecture, an issue with other previous work.

Further, a year later, we identified camera usage, a lack of pre-meeting interactions, and multitasking as stressors of videoconferences. This is meaningful because the source of stress appears to have evolved to include elements that were less problematic in the face-to-face era of workplace meetings, when most meetings were in person. The expansion of stressors to include the lack of pre-meeting interactions highlights the importance of social interaction that is not meeting-prescribed [41].

In addition to the stressor side of the equation, we also discovered individual- and team-level coping strategies that employees and team leaders came up with to cope with these new stressors of everyday remote work. Note, the purpose was not to test whether these efforts were helpful in an empirical way, but rather to see what people were actually doing at that moment. Evidence suggests that inserting recovery time for individuals assists with managing the stress of remote work.

5.1. Challenges of Remote Work

The findings from our first study lend further support to the notion that overlaps between work and private life constitute a central challenge of remote work during the COVID-19 pandemic [7]. Transferring workplaces to remote settings in private households brings about new and different distractions. For example, the physical distance barrier from home that exists when going to an office in another location no longer exists. Thus, childcare obligations, housework, or leisure opportunities (e.g., watching television or napping on the couch) become more proximal and more distracting, while detaching from the workplace in the evening can be difficult.

Our qualitative insights further show that technology issues make remote work particularly stressful, which is consistent with the current qualitative findings [8]. With IT support or helpful colleagues no longer at arm's reach, receiving technical support when problems arise is less convenient or even impossible for remote employees. Additionally, in some cases, the technology that is available at home differs from the technology available at the office, requiring additional training that remote IT support may not be able to provide. This incompatibility and training issue also arises when companies use a range of different software solutions to conduct their videoconferences. Because there is no universal videoconferencing or virtual collaboration platform, employees need to be familiar with a broad range of tools.

5.2. Stressors Associated with Videoconferences

Interestingly, our findings indicate that turning off the camera in videoconferences was perceived as a stressor of videoconferences, which is opposite to current quantitative results by Shockley et al. [9], who found that turning off the camera in videoconferences was perceived as less stressful. This may be explainable by the fact that we interviewed meeting leaders, who may possibly have a different perspective on camera usage in virtual meetings than the meeting participants. Another explanation, which would extend from meeting leaders to other meeting attendees as well, concerns the timing of the data collection. Shockley et al. [9] collected their data at the beginning of the second wave of the COVID-19 pandemic, after a summer characterized by increasing relaxation of restrictions and the associated freedoms, and before things became increasingly restrictive again. We, on the other hand, collected our data in the spring of 2021, after the long-lasting COVID-19 winter of 2020/2021 that was characterized by strict restrictions affecting everyone's lives. Thus, the individuals we interviewed had already been exposed to a long period of social distancing beforehand. The lack of social interaction in all spheres of life (e.g., [31]) may have meant that, at that point, camera use had become a welcome opportunity to connect with others. We would argue that our finding regarding camera use continues to be relevant

during the ongoing pandemic and the changing nature of work beyond the pandemic. Moreover, turning the camera on not only promotes virtual meeting etiquette (e.g., [14]) but has benefits for team dynamics as well, as was also discussed by the meeting leaders in our sample. This should be weighed against the preferences of individual attendees who might prefer their camera off (with the possibilities to disengage from the meeting that come along with that choice). It would be interesting to investigate the effects of camera usage in other meeting contexts, such as customer meetings, virtual educational meetings such as training workshops, or virtual coffee break meetings to untangle controversial effects.

Furthermore, we identified a lack of pre-meeting interaction as a stressor of videoconferences. Pre-meeting interaction, the talk that happens immediately before a formal meeting begins (e.g., when all team members arrive early and wait for their leader to arrive), is a vital component of face-to-face meetings that makes for a smoother and more enjoyable meeting experience, particularly for introverts [41]. Given that videoconferences usually start on time, with all participants opting in at the minute the meeting begins, there is no room for informal social interaction. Our findings align with research showing that informal communication indeed appears to be neglected in videoconferences [10]. Given that informal communication is crucial for remote workers, finding and evaluating ways to incorporate informal communication into the virtual context is a relevant area for future research.

Multitasking was reported to occur frequently in videoconferences, which aligns with recent quantitative insights that the virtual format invites attendees to multitask [51]. Our qualitative insights regarding the evaluation of multitasking correspond to previous research showing that work-related multitasking is more accepted among co-workers than non-work-related multitasking [52]. However, our data also indicate that multitasking can be both boon and bane for remote workers. While some reported perceiving multitasking as useful for maintaining productivity, particularly when a meeting is not relevant to them, the general opinion of our sample was that multitasking threatens meeting quality and should thus be avoided. We would argue that following the best practices to make meetings relevant for participants should be the priority, rather than normalizing multitasking.

5.3. Coping with Virtual Meeting Stressors

Meeting leaders appeared to recognize the stressors that virtual meetings bring and reported that they developed coping strategies over time both individually and together with their team. Current qualitative findings have already revealed that employees have begun to actively engage in reducing the negative effects of virtual meetings [8]. We expand this literature by showing that meeting leaders both come up with ideas about how to improve their virtual meeting experiences for themselves personally (e.g., looking away from the screen or walking around), but also with their team, whereby team members together discovered what they needed and how to achieve it. For example, this can include establishing team meeting norms for when to use the camera or not, or the active incorporation of software tools to structure meetings. Using an emoticon to show that a person wants to contribute something to the meeting or to show a reaction to something can help avoid interrupting the communication flow. Additionally, our qualitative insights indicate that teams have created their own virtual spaces to compensate for the informal communication that normally takes place in face-to-face meetings and developed virtual socializing sessions such as virtual coffee breaks.

5.4. Multilevel Consequences of Virtual Meeting Stressors

Our in-depth analysis of meeting leaders' experiences in Study 2 revealed that the effects of virtual meeting stressors occur both at the individual and team levels. We identified individual-level consequences of virtual meeting stressors (e.g., impaired eyesight) and consequences at the team level (e.g., impaired team cohesion). This is not surprising, given that teams are multilevel in nature [53] and meetings are contexts in which teams come together to interact.

While previous research has primarily focused on the individual level (e.g., [9]), our findings suggest that researchers should consider the potential stressors of videoconferences at either of these levels. This is in line with recent occupational stress research indicating that multilevel perspectives are necessary to understand how stressors emerge in team contexts [54,55]. In essence, how do individual team members' characteristics and team-level factors interplay to turn virtual meeting characteristics into stressors? Individual factors, such as personality traits (e.g., introversion) and individual work experiences (e.g., weekly virtual meeting load), may predispose a person to perceive virtual meeting characteristics as stressful. At the same time, static aspects of the team, such as team composition, and more dynamic components, such as team members' interaction behaviors, likely influence the experience of virtual meeting characteristics as stressors. Future research should adopt multilevel approaches to advance the understanding of the role of the team context in the emergence of virtual meeting stressors. The consideration of team-level factors also has practical implications in terms of intervening at the appropriate level.

5.5. Limitations and Future Directions

Our qualitative approach highlights that the sudden shift to remote work and videoconferences came along with new workplace stressors. Yet, our set of studies also has limitations that indicate opportunities for future research. While using surveys for qualitative studies, as in Study 1, is a common and justified approach to conduct qualitative research in an economic way (e.g., [56]), this may fall short in data richness when compared to semi-structured interviews where the interviewer can specify their questions in situations of uncertainty. We addressed this in Study 2. However, our cross-sectional approach in Study 2 still did not allow for causal inferences. Hence, our data provide initial indications of the underlying mechanisms of stressors, explaining why they are stressful. This, however, still requires additional clarification in future research.

Further, the applied sampling methods of Study 1 and Study 2 differed, which may have affected the results. For Study 1, we recruited a convenience sample using Mturk, whereas we relied on personal networks and a snowball approach for participant recruitment in Study 2. Although Mturk is a widely accepted possibility in the social science research community, it may fall short in terms of validity [57]. We, nevertheless, decided to use Mturk for Study 1 because it gave us a chance to reach a large number of participants in a short time. In order to increase the validity of our Mturk-based findings, we applied strict inclusion criteria, included an attention check, and constrained the sample to only participants in the US to avoid bots or mass Mturk groups in other countries. For Study 2, we pursued a snowball approach because it was more important for us to reach the right people than to collect our data in a short period of time [47]. However, snowball sampling comes with drawbacks regarding representativeness and external validity of the data, as the people who begin the snowball stem from the researchers' private networks. To address this issue, we set off five different snowballs using the networks of different people. However, the generalizability of Study 2's results remains limited. Future researchers could address this by defining specific diversity criteria that their sample needs to match, such as specific cultural backgrounds or industries that should be included.

Another limitation is that our in-depth approach in Study 2 (i.e., in-depth interviews) required a smaller sample size and a focus on a particular type of meeting attendees (i.e., meeting leaders), which limits generalizability. We included meeting leaders from the US and Germany to allow for some cultural diversity, but we acknowledge that our conclusions do not necessarily generalize to other cultural settings. Further, the study was not designed to deliberately capture cultural differences, and so further exploration of such differences is needed using a methodology and approach with that aim and purpose. Additionally, restricting the inclusion to meeting leaders in Study 2 certainly limited the generalizability of our findings, but should be still regarded as a strength of our work at the same time, given the role meeting leaders play in the context of meetings. Future research can go further and determine how meeting leaders' awareness of virtual meeting stressors impacts

how they run their meetings, what adjustments they make naturally, and what benefits they gain by implementing recommended practices. Meeting leaders spend a considerable amount of their daily work time in meetings and are usually the ones who facilitate the meetings (e.g., [45]). If these leaders perceive stressors in videoconferences, the stressors will likely trickle down to all other attendees in the meeting. Additionally, it would be of interest to evaluate the perceptions of meeting participants, as opposed to leaders, in more depth using semi-structured interviews. This would provide a different perspective on perceptions of videoconferences.

Another limitation and opportunity for future research includes the potential for the experience of remote work to change based on the nature and character of the work. For instance, a larger company may have more formalized policies around work-from-home, and that may enable or constrain the ability of the employee to engage in a variety of coping strategies. Further, some work is physical in nature and requires being at a location for specific tasks. The physical nature of the work or tasks associated with a given work-role will have a great impact on the degree to which an employee could choose to participate in remote work. For example, workers in manufacturing likely cannot work remotely, whereas office workers in the banking industry can. These differences were not explored in the current study because the samples were too small to allow grouping by these differences, and due to the overt focus on jobs that naturally have remote-work capabilities. Thus, these differences require exploration in future research, either qualitatively or quantitatively.

6. Conclusions

In sum, our studies' findings help to explain why remote work and virtual meetings can be stressful experiences for employees and leaders alike. The videoconference-related stressors we identified may contribute to increased feelings of fatigue for employees and leaders. As we collected our data at the beginning of the drastic shift to mainly remote working and one year later, employees in our sample had already had time to adapt to the new situation. Our findings show that even after that period of adaptation, multiple characteristics of virtual meetings were still perceived as stressful, which warrants additional research attention as well as consideration for the practice of virtual meetings and their management.

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