



Pandemic-Induced Telework Challenges and Strategies

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Abstract

Prior to the COVID-19 pandemic, telework was an established discretionary practice with a considerable amount of research. However, the COVID-19 pandemic forced people who had never worked from home before to do so. Our two-wave descriptive investigation provides a historical snapshot of what approximately 400 teleworkers experienced in the first two to three months of the pandemic. We explored how this experience differed for those who had previously teleworked, those who had children in their home, and those who had supervisory responsibilities. The data exposed telework challenges and pandemic-specific challenges. The results support job crafting theories that teleworkers proactively implement strategies to adjust their boundaries and relationships to meet their need (Biron et al., *Personnel Review*, 2022). The data also revealed that employees were still struggling two months later, despite implementing strategies like self-care, taking breaks, and psychological reframing. This research provides detailed evidence of how pandemic-induced telework is not the same as traditional telework and some initial evidence of the pandemic-induced telework adjustment time period.

Keywords Telework · Pandemic · Challenges · Strategies · Job crafting

Introduction

In March 2020, millions of workers across the globe were ordered to telework in an effort to slow the spread of the COVID-19 virus. This change in work location was an emergency solution for employers and workers attempting to maintain business continuity in spite of the health and safety concerns associated with large numbers of people gathering in a common work location. During the COVID-19 pandemic,

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telework became a health and safety requirement rather than a discretionary and temporary alternative work location made available to certain employees (Belzungegui-Eraso & Erro-Garces, 2020). In this emergency state, minimal time was available to create a conducive work environment at home and ensure work processes and tasks could be accomplished effectively at home. As a result, telework during the pandemic – especially during the initial adjustment period – presented challenges to employees and employers all over the world.

Whereas challenges have been identified in pre-pandemic telework studies (e.g., Bailey & Kurland 2002; Greer & Payne, 2014; Pérez et al., 2002), previous research focused primarily on employees who chose to telework and those who were relatively successful at doing so. For example, Greer and Payne (2014) presented six telework challenges reported by 86 high performing teleworkers. We sought to extend their results by identifying the extent to which pandemic-induced teleworkers experienced the same challenges and if the identified challenges varied for inexperienced teleworkers, parents, men vs. women caregivers, and/or employees with supervisory responsibilities. We speculated that the unprecedented circumstances of teleworking during a global pandemic presented new additional challenges that are important to document and differentiate from traditional telework challenges.

Another limitation in the pre-pandemic telework literature is the reliance on cross-sectional survey studies that only present a snapshot of data and do not allow for an examination of change or adaptation over time (cf. Allen et al., 2015). Any modification to a work arrangement is likely to take some time to get used to and cross-sectional methods do not tell the evolving story of these adjustments. During the pandemic, even experienced teleworkers had to adjust to pandemic-specific issues (e.g., uncertainties about the virus, children in the home) while working from home.

Many people tend to be resistant and uncomfortable with change – particularly the uncertainties associated with it (Bordia et al., 2004; Milliken, 1987). However, employees can proactively adapt to change by altering their cognitions and behavior in order to fulfill important needs. Wrzesniewski and Dutton (2001) proposed that employees proactively craft their jobs by changing task and/or relational boundaries which shape interactions and relationships with others at work. Building on job crafting theory, Biron et al. (2022) recently proposed a process model of need satisfaction in which teleworkers proactively and continuously conduct cognitive crafting of identities, physical crafting of boundaries and tasks, and relational crafting of networks.

Proactive efforts to manage telework arrangements are also referred to as task and behavioral strategies. In this study, we build on previous work documenting various strategies that teleworkers use (Greer & Payne, 2014) and propose that teleworkers used additional strategies to navigate pandemic-induced telework, which presented a new set of challenges for teleworkers. Accordingly, we document the strategies used by teleworkers to reduce telework challenges experienced during the pandemic. Our study highlights the extent to which a subset of telework challenges changed over the first two to three months of the pandemic in response to enacted strategies.

Whereas pandemic-related challenges were likely apparent to experienced teleworkers (e.g., anxiety about catching the virus; Zacher & Rudolph, 2021), inexperienced teleworkers were less likely to differentiate pandemic-related challenges from traditional telework challenges (e.g., interruptions from pets). During the pandemic,

researchers speculated that “newly remote workers have to create new strategies for maintaining boundaries,” between work and nonwork and “blurring may be intensified for those who are also sharing their ‘place of work’ with nonwork role members (i.e., partners, children) rather than with coworkers, requiring additional negotiation and strategic management” (Allen et al., 2021, p. 256). Consistent with Biron et al.’s (2022) conceptualization of telework as a dynamic process of adjustment and speculation that experienced teleworkers should require less job crafting, we examined the pandemic-induced telework challenges reported by workers during the early months of the pandemic (April through June 2020) and compared experienced teleworkers to inexperienced teleworkers. We sought to answer three broad research questions:

1. Were pandemic-induced telework challenges similar to previously identified pre-pandemic telework challenges?
2. Did telework challenges and strategies differ for inexperienced teleworkers, parents, and/or those with supervisory responsibilities? Were there differences between men and women caregivers?
3. Did the prevalence of telework challenges change over the first two to three months of the pandemic?

Pre-Pandemic Telework Challenges and Strategies

Prior to the pandemic, researchers had identified a number of challenges to telework (e.g., Greer & Payne 2014; Kossek et al., 2015; Kurland & Bailey, 2002). For instance, Kurland and Bailey (2002) noted difficulties with performance monitoring, jealousy by non-teleworking employees, and lack of synergy among team members. Furthermore, they documented challenges related to coordinating work tasks and ensuring availability of team members who were working remotely. Kossek et al. (2015) identified three pitfalls or “traps” of implementing flexible work arrangements, like teleworking: (1) altering work-life dynamics (e.g., reduced contact with coworkers, job and family creep), (2) the potential impact of negative equity and fairness of flexibility programs (e.g., coworkers’ perceptions of injustice, gatekeepers to flexibility allowing usage arbitrarily), and (3) potential negative impacts of workplace flexibility on organizational culture (e.g., flexibility may be viewed as undermining a creative culture). Telework researchers also recognized a home environment that was not conducive to work would threaten the effectiveness of telework practices (Allen et al., 2021; Kurland & Bailey, 2002).

In a sample of 86 *high performing* teleworkers, Greer and Payne (2014) asked supervisors of teleworkers to identify challenges associated with teleworking. In their study, six challenges were identified and described in open-ended responses, including but not limited to missing face-to-face interaction with coworkers, difficulties coordinating with coworkers and managing/supervising other employees, access to technology and other office resources, and interruptions/distractions in the home environment (see Table 1).

Table 1 A comparison of descriptive statistics for telework challenges to Greer and Payne (2014)

Greer & Payne		Focal Study			Rank	Telework Challenge
Rank	Frequency/ Percentage N = 58	Percentages	M (SD) Rating N = 804–808	Rank		
1	23 (40%)	89%	2.43 (1.32)	1	Missing face-to-face interaction	
2	22 (38%)	74%	1.38 (1.11)	5	Difficulties coordinating with others	
3	13 (22%)	60%	1.07 (1.09)	8	*Difficulty managing or supervising others	
4	6 (10%)	26%	0.41 (0.81)	16	Resentment from those who cannot remote work	
5	5 (9%)	86%	1.93 (1.27)	2	Interruptions or distractions in the home environment (e.g., people, pets, other temptations)	
6	4 (7%)	61%	1.15 (1.23)	7	Access to good quality equipment/resources	
		72%	1.21 (1.04)	6	Technical difficulties due to technology limitations	
		70%	1.88 (1.58)	3	*Keeping children entertained/cared for	
		64%	1.59 (1.49)	4	*Helping children with their schoolwork	
		50%	1.04 (1.25)	9	Concerns about personal health & safety	
		53%	0.95 (1.15)	10	Challenges with transitioning work to be online	
		46%	0.85 (1.17)	11	Insufficient time to prepare for remote work	
		42%	0.69 (0.99)	12	Concerns about information security	
		38%	0.64 (0.97)	13	Lack of control over my work	
		32%	0.57 (0.99)	14	Little remote work knowledge or experience	
		32%	0.50 (0.86)	15	Resistance to change job procedures	
		23%	0.38 (0.83)	17	Resistant/lack of support from my supervisor	

Note. The phrases used in Greer and Payne (2014) were slightly different, but the meaning of the content remains the same. For example, Greer and Payne reported “face-to-face communication” and “interdependencies of work” as the first two challenges in the table. Percentages in focal study represent the percent of the sample that rated the extent to which they experienced each challenge as more than 0 = none (1 = small, 2 = some, 3 = moderate, or 4 = great) and not as “Not Applicable.” *Person-specific (e.g., parent, supervisor) challenges

Greer and Payne (2014) also identified twelve strategies that teleworkers reported implementing as ways in which they overcame telework challenges (e.g., using advanced technologies, being accessible via technology, effectively communicating with coworkers/supervisor; see Table 2 for a complete listing). Several of these strategies were positively correlated with work-family facilitation in their study, showing empirical support for the positive impact of using these strategies to overcome telework challenges.

Pandemic-Induced Telework

The COVID-19 pandemic was the impetus for the largest simultaneous adoption of telework in history. This transition was deemed necessary to preserve health, well-being, and business continuity during the global pandemic (Belzunegui-Eraso &

Table 2 A comparison of descriptive statistics for telework strategies to Greer and Payne (2014)

Greer & Payne		Focal Study			Telework Strategies
Rank	Frequency/ Percentage N = 86	Rank	Percent that rated strategy as helpful	M (SD) Rating N = 686–799	
1	15 (17%)	1	96%	3.25 (1.05)	Good quality resources (equipment, internet, etc.)
1	15 (17%)	3	94%	2.81 (1.17)	Making myself available to my supervisor and colleagues
3	11 (13%)	2	96%	2.98 (1.12)	Maintaining regular communications with my colleagues and supervisor
4	9 (10%)	4	95%	2.64 (1.13)	Structuring my work environment
5	8 (9%)	5	94%	2.63 (1.18)	Adopting a work-oriented mindset and routine
5	8 (9%)	9	85%	2.15 (1.32)	Getting more accomplished than what was likely expected
5	8 (9%)	NA	NA	NA	Be location flexible
8	7 (8%)	NA	NA	NA	Schedule telework
9	6 (7%)	7	92%	2.43 (1.20)	Planning tasks
10	3 (3%)	8	86%	2.20 (1.30)	Communicating with people in my home about my availability
11	2 (2%)	6	93%	2.52 (1.16)	Setting goals and prioritizing tasks
11	2 (2%)	10	74%	2.00 (1.55)	*Trading off tending to children's needs with my partner
		11	46%	1.35 (1.66)	*Securing childcare help

Note. Percentages in focal study represent the percent of the sample that rated the extent to which each strategy contributed to their ability to work from home effectively more than 0 = none (1 = small, 2 = some, 3 = moderate, or 4 = great) and not as “Not Applicable.” *Parent-specific strategies

Erro-Garces, 2020). However, for many reasons, home was not the ideal environment for many workers – especially those who had dependents who needed care, help, and supervision (Jenkins & Smith, 2021). Due to the partial or full shutdown of most workplaces and schools, many workers found themselves sharing their home and its resources with all other occupants, all-day every day, which is likely to affect the telework experience.

Pandemic-induced telework differed from pre-pandemic telework in several ways. First, pandemic-induced telework was not discretionary; it was globally mandated by governments for nonessential personnel. Therefore, some strategies (e.g., schedule telework days, be location flexible) were not relevant during this time. Second, the transition to pandemic-induced telework was sudden and without proper preparation and time to equip workers with appropriate tools and technology (Carillo et al., 2021); instead, employers assumed the home was a suitable place for workers to conduct business (Jenkins & Smith, 2021). While managing their labor in the home and the threat of the COVID-19 virus, workers had to quickly adjust to the telework arrangement by crafting strategies to overcome the challenges. Third, organizations that typically conducted business face-to-face began relying extensively on videoconferencing technologies (e.g., Zoom, Microsoft Teams) to conduct meetings and provide services. Workers had to identify new ways to get their work done (e.g., accept electronic signatures rather than handwritten ones). The pandemic “fast tracked” the use of several emerging technologies which many employees had little previous experience using (Maillot et al., 2022). Technology became especially important for job-related information sharing (Shockley et al., 2020).

A major challenge for many workers at the onset of pandemic-induced telework was the immediate blurring of boundaries between work and non-work (Kerman et al., 2022; Maillot et al., 2022), resulting in physical, temporal, relational, and psychological boundary violations (Allen et al., 2021; Clark, 2000). According to work/family border theory, boundaries (or borders) are conceptualized as the “imaginary lines” or “mental fences” that separate work from non-work roles (Clark, 2000; Zerubavel, 1991). Boundary violations occur when events breach the boundaries between work and private life (Kreiner et al., 2009). While existing research suggests employee preferences for intentional separation (known as “segmentation”) of their work and nonwork roles can help mitigate the negative consequences of boundary violations (e.g., Allen et al., 2021), by definition, workers had less discretion over pandemic-induced telework. Teleworkers can address these boundary violations by imposing or “crafting” physical and temporal boundaries around work-related tasks and relationships. We return to this idea later in the [job crafting](#) section.

Telework as Extra-Normative Work

Theoretically, some workers were likely to find this transition and new work arrangement more challenging than others. Calderwood et al. (2023) offered that employees who were not previously expected to telework may perceive pandemic-induced telework as extra-normative work, a term “which reflects work arrangements wherein effort is required in ways, at times, and/or from locations that differ substantially

from employees' typical expectations" (Calderwood et al., 2023, p. 1). According to situational strength theory, strong situations provide more information about expected behaviors (Mischel, 1977; Meyer et al., 2010) defined situational strength as a multifaceted construct that consists of four facets: *clarity*, *constraints*, *consistency*, and *consequences*. We describe how each of these potentially manifest during pandemic-induced telework and contribute to disparities between various groups.

Clarity involves unambiguous information about employee behavior expectations in a given situation (Meyer et al., 2010). Employees with telework experience were likely to have more clarity over what they needed to do and how to do it from home than employees without telework experience (Biron et al., 2022; Raghuram et al., 2001). Therefore, we compare teleworkers with and without experience as we anticipated experienced teleworkers would report fewer challenges than inexperienced teleworkers.

Constraints concern the extent to which employees' decision making and actions are limited by outside forces (Meyer et al., 2010). During the pandemic, daycares were temporarily closed and most, if not all schools, transitioned to online delivery of instruction. As a result, teleworkers shared their workspace (home) with nonwork members during work (and nonwork) hours. The closing of childcare and schools was an additional constraint likely to have the greatest adverse effect on parents with young children compared to workers without young children. Given historical trends in which women are socialized and tend to take on more household and caretaking responsibilities than men (Bianchi et al., 2012; Pleck, 1977), we anticipated that women caregivers may have experienced more challenges when teleworking than men caregivers due to the school closure constraint. For example, women caregivers may have been called upon more often during the workday to help young children with schoolwork, entertain them if they were not schooling, or prepare and serve them food. Previous research has shown partners (e.g. spouses) expect teleworking partners to take on more at-home responsibilities (e.g., meeting the repair person, meal preparation; Hammer et al., 2005). Further, research during the pandemic revealed women reported providing significantly more childcare than men (Berghammer, 2022; Krukowski et al., 2021). Correspondingly, we examine gender differences in pandemic-induced telework challenges and strategies within the parent subsample.

The third facet of situation strength is *consequences*, which captures the extent to which an employees' decisions or actions have a positive or negative impact on others (Meyer et al., 2010). For many supervisors, the COVID-19 pandemic was the first time all of their direct reports teleworked simultaneously. Providing guidance and support to subordinates on how to telework with minimal to no preparation during a pandemic presented additional responsibilities and challenges that non-supervisors did not have to deal with. Due to the nature of their role, supervisors tend to have a higher workload given their responsibilities for the people who report to them, which increases the potential consequences of the supervisor's behaviors. Therefore, we propose that supervisors reported experiencing more challenges than non-supervisors during pandemic-induced telework.

The fourth situational constraint facet is *consistency*, or "the extent to which cues regarding work-related responsibilities or requirements are compatible with each other"

(Meyer et al., 2010, p. 126). In the earliest days of pandemic-induced telework, there were many inconsistent messages from the government, health officials, and organizations due to the quickly changing and unprecedented nature of the pandemic, making it a stressful situation for all. As leaders learned more about the virus and the appropriate responses for coping with the virus, the messaging became a bit more consistent. Accordingly, we expected teleworkers to report a decrease in the challenges they were experiencing over time.

Job Crafting

Building on Wrzesniewski and Dutton's (2001) theory of job crafting, Biron et al. (2022) described telework as a dynamic process of continuous adjustment. Specifically, teleworkers' satisfaction of needs for competence, autonomy, and relatedness, as well as feedback from multiple sources (self and others) serve as enabling mechanisms for this continuous process. They proposed that teleworkers engage in cognitive crafting of work and nonwork identities, physical crafting of work-nonwork boundaries and task allocation, and relational crafting of professional and personal networks. For example, teleworkers cognitively craft their work identity to allow them to identify as a member of a given organization even though they may not always travel to a common physical location to connect with colleagues. They might set aside a physical space in their homes with a door to physically craft a boundary between work and nonwork roles and limit interruptions from family members. Additionally, teleworkers are likely to rely on various communication technologies to craft and maintain various work-related relationships.

Other researchers have empirically examined job crafting by teleworkers during the pandemic. In a study of over 500 teleworkers in Italy, broad job crafting behaviors mediated the negative impact of work overload on stress (Ingusci et al., 2021). In another study of over 450 higher education employees in Finland, the most engaged teleworkers demonstrated more job crafting behaviors than less engaged teleworkers (Mäkikangas et al., 2022).

In our study, we sorted pre-identified lists of telework challenges and strategies into the cognitive, physical, and relational categories proposed by Biron et al. (2022). We depict this information in Tables 3 and 4. We also posit that teleworkers engage in temporal boundary crafting (altering the time of day they allocate to work tasks) when given discretion over when they work.

Method

After obtaining Institutional Review Board approval, we collected data using two online surveys that included quantitative measures and open-ended questions.

Table 3 Telework challenges organized by job crafting categories

Cognitive challenges	Physical and temporal challenges	Relational challenges
Little remote work knowledge or experience	Interruptions or distractions in the home environment	Missing face-to-face interaction
Concerns about personal health & safety	Technical difficulties due to technology limitations	Difficulties managing/supervising others
Resistance to change job procedures	Concerns about information security	Difficulties coordinating with others
	Lack of control over my work	Resistance/lack of support from my supervisor
	Transitioning work to be online	Resentment from those who cannot remote work
	Access to good quality equipment/resources	Helping children with their schoolwork
	Insufficient time to prepare for remote work	Keeping children entertained/cared for

Table 4 Telework strategies organized by job crafting categories

Cognitive crafting	Physical and temporal crafting	Relational crafting
<p>Adopting a work-oriented mindset and framing: Engaging in routines that promote the adoption of a work role identity.</p>	<p>Structuring my work environment: Setting up a physical environment that is conducive to work taking into consideration noise, temperature, and the ergonomic arrangement of furniture and equipment.</p>	<p>Be accessible: Maintaining connections via technology (including email and mobile devices) so that coworkers, supervisors, and clients can communicate with teleworkers and teleworkers can respond in a timely fashion.</p>
<p>Structuring my work environment: Arranging the work space to facilitate focusing on work, minimize interruptions, distractions, and temptations.</p>	<p>Plan tasks: Planning to complete tasks that can be easily completed in the home environment (e.g., independent tasks that do not require extensive interaction with others – particularly face-to-face).</p>	<p>Communicate with coworkers/supervisor: Communicating with coworkers and supervisors in advance and while teleworking about expectations, availability, and progress on work.</p>
<p>Set goals and prioritize: Organizing work tasks according to importance for completing in the near time frame</p>	<p>Be extra productive: Making a concerted effort to be extra productive when teleworking</p>	<p>*Schedule telework: Making a concerted effort to schedule teleworking in advance or systematically; especially when it is most convenient for the employee, coworkers, and client</p>
<p>Adopt a work-oriented mindset: Mental and psychological preparation that is conducive to working. Regulating one's behavior to focus and concentrate on work. Creating temporal boundaries from nonwork activities (since the physical boundaries are reduced).</p>	<p>Use dedicated childcare: Outsourcing the care of young children to allow the teleworker to focus on work tasks without interruptions from children.</p>	<p>*Be location flexible: Willingness to work at the main worksite when it would be more helpful for others or the nature of the work that needs to be completed is less transportable; recognizing the value of spending time at the employer's worksite.</p>
<p>Use dedicated childcare: Outsourcing the care of young children to allow the teleworker to focus on work tasks without interruptions from children.</p>	<p>Communicate with family: Communicating with others who live in the same house (usually family) that the teleworker needs to be able to get work done without interruptions during set times or when he/she is in a designated workspace.</p>	<p>Communicate with family: Communicating with others who live in the same house (usually family) that the teleworker needs to be able to get work done without interruptions during set times or when he/she is in a designated workspace.</p>

Note. *Strategies deemed to be infeasible by the authors during the pandemic and therefore not administered in the current study

Participants and Procedure

We recruited participants by email and social media initially through our personal and professional networks and then “snowballing” or forwarding the invitation to other potential participants. In exchange for their participation in each survey, respondents who provided contact information were entered into a drawing for one of three \$50 gift cards. The only criterion for inclusion in the study was that the participant had to be employed when responding to the Time 1 (T1) survey, which was administered April 6–30, 2020 (very closely following stay-at-home orders issued in most states). Whereas over 1000 people clicked on our survey link, the sample was reduced to the 851 participants who (1) completed at least a third of the survey, (2) indicated at least some portion of their job was conducive to working from home, and (3) responded correctly to at least two out of three directed response items.

A majority (97%) of the respondents worked in the US in a variety of different industries. The largest industry categories were higher education (18.0%), professional and business services/consulting (17.5%), and health/medical services (10.6%). Participants ranged in age from 18 to 73 years old ($M=39.12$, $SD=10.61$). The sample was predominantly White/Caucasian (84.7%), and the majority of respondents were women (67%), married (64%), and had a Bachelor’s degree or higher (90.6%). 40% of the respondents had at least one child who was 18 years or younger at home (number of children: $M=0.77$, $SD=1.11$). Two hundred fifty-six participants (30%) indicated they were a supervisor at T1. One-quarter (26%) indicated they had never worked from home before.

Approximately two months later (June 8–26, 2020), we sent a second survey to the 716 T1 participants who provided contact information and expressed interest in participating in a second survey. Of these, 395 individuals (55% response rate) provided Time 2 (T2) survey responses. On average, there were 63.94 ($SD=6.70$) days between the T1 and T2 responses.

Telework Challenges and Strategies

The T1 survey contained 17 potential telework challenges and 11 strategies to combat those challenges, derived from the pre-pandemic telework literature. The telework challenges were adopted from Greer and Payne (2014) with a few notable differences. First, given popular press about internet bandwidth issues during the pandemic, we divided Greer and Payne’s “lack of resources” challenge into the following two challenges: “good quality equipment/resources” and “technical difficulties due to technology limitations”. Second, considering the rapid transition to pandemic-induced telework, we added three additional challenges: “challenges with transitioning work to be online,” “insufficient time to prepare for remote work,” and “resistance to change job procedures.” Third, we added two items for parents: “helping children with their schoolwork” and “keeping children entertained/cared for”. Fourth, one item was added specifically for supervisors: “difficulties managing or supervising others.” A complete listing of the challenges appears in Table 1.

Telework strategies listed in the T1 survey were also adopted from Greer and Payne (2014) with a few modifications. First, because pandemic-induced telework was presumed to be mandatory during the data collection period, we did not ask respondents to rate two of Greer and Payne's telework strategies: "be location flexible" and "schedule telework". Second, because of the school and daycare closures during the data collection period, we divided Greer and Payne's (2014) "using dedicated childcare" strategy into two additional telework strategies: "trading off tending to children's needs with my partner" and "securing childcare help". A complete listing of the strategies appears in Table 2.

Participants were prompted with the following instructions for the challenge items: "The following is a list of common challenges or barriers to working from home. Please rate the extent to which you have experienced these challenges." Instructions for the strategy items read: "The following list contains some resources and strategies for overcoming remote work challenges. Please rate the extent to which each of these helped you and contributed to your ability to work from home effectively." Respondents rated both challenges and strategies on a 5-point extent scale (0=no extent, 4=great extent, NA). After each set of items presented in a matrix format, participants were given the option to write in up to three additional challenges as well as strategies with prompts of "Other #1," "Other #2," and "Other #3" and rate them using the same scale. To keep the length of the second survey manageable, only six of the seventeen challenges listed in the T1 survey were presented in the T2 survey. The challenges included in the T2 survey were ones rated relatively highly at T1 and were relevant to all (regardless of parenting or supervisory status).

The second author and a research assistant coded the open-ended responses using a content-analysis approach. After reading all the responses, the coders noticed most responses were specific examples of the challenges and strategies listed in the survey. For example, the written response "slow internet speed due to living in the country that impacts Zoom meetings" is a specific example of "technological difficulties due to technology limitations." These responses were assigned to categories that were listed in the survey. When responses did not fall into a previously identified category, new categories were proposed by both coders. The coders then came together and discussed the new categories that emerged, the most descriptive and unique labels for the new categories, and a definition for them. Then the coders completed their individual coding by assigning all responses to the agreed upon categories. After all the responses were coded into an existing or new category by both coders, the coders met to discuss any discrepancies in coding and resolved to consensus.

Results

A comparison of T2 respondents and nonrespondents on the T1 study variables revealed that T2 respondents were not different on any of the demographic variables except race, with T2 respondents more likely to classify themselves as White/Caucasian ($t(849) = -2.19, p < .05$). T2 respondents were significantly more likely

to have teleworked before ($t(849) = -3.85, p < .05$) but they were not different on parenting or supervisory status. In terms of challenges, T2 respondents reported the following challenges to a lesser extent at T1 compared to T2 nonrespondents: “resistance/lack of support from my supervisor,” ($t(759) = 2.35, p < .05$) “access to good quality equipment/resources,” ($t(792) = 2.66, p < .05$) “resistance to change job procedures,” ($t(767) = 2.41, p < .05$) and “lack of control over my work” ($t(776) = 2.31, p < .05$). Furthermore, T2 respondents rated the following strategies at T1 as significantly more effective than nonrespondents: “good quality resources” ($t(755) = -4.58, p < .05$) “maintaining regular communication with my colleagues and supervisors,” ($t(792) = -2.24, p < .05$) “structuring my work environment,” ($t(783) = -3.19, p < .05$) and “adopting a work-oriented mindset and routine” ($t(786) = -2.81, p < .05$).

Pandemic-Induced Telework Challenges

Our first research question asked how were pandemic-specific telework challenges similar to previously identified pre-pandemic challenges. Table 1 contains descriptive statistics for the challenges listed in both Greer and Payne’s (2014) study and the current study. Consistent with previous research, the most highly rated telework challenge was “missing face-to-face communication.” This was followed by experiencing “interruptions or distractions in the home environment”. The third and fourth most highly rated challenges concerned children: “keeping them entertained and cared for” and “helping them with their schoolwork,” supporting likely differences between parents and non-parents. The next four challenges rated relatively highly by the current sample were: “difficulties coordinating with others”, “technical difficulties due to technology limitations”, “access to good quality equipment/resources”, and “difficulty managing or supervising others”.

Surprisingly, challenges anticipated to be more relevant during the pandemic, such as “challenges with transitioning work to be online” and “insufficient time to prepare for remote work,” were rated lower by participants in the current study compared to pre-pandemic telework challenges. One challenge that was less prevalent for respondents in this study was “resentment from those who cannot remote work,” perhaps because in many organizations, pandemic-induced telework was experienced simultaneously by as many employees as possible.

Survey respondents were permitted to write up to three additional challenges in the survey, *potentially* revealing pandemic-specific telework challenges. A total of 187 open-ended responses were recorded. Most ($n = 123$; 66%) of these responses were personalized experiences and accounts of the challenges previously listed in the survey and therefore were not new or pandemic-specific. For example, one respondent wrote “*lack of in person client interaction*” which is a specific example of “missing face-to-face interaction.” Another respondent wrote “*constant petting of a very needy dog!*” which could be classified under “interruptions or distractions in the home environment (people, pets, other temptations).”

Some open-ended challenge responses corresponded to the challenges listed in the survey (e.g., technical difficulties due to technology limitations) but were more

broadly described, often a result of the pandemic affecting other things like the overall demand for Internet bandwidth and children schooling from home. For example, one respondent wrote “*Limited tech resources for husband also working from home and children attending virtual school classes.*” Another respondent wrote, “*Obstacles and inefficiencies created by the practices, needs and habits of coworkers who are themselves not adept at using technology to work remotely or whose inability or refusal to adapt work habits requires others to do substantially more work, invest substantial time and/or adjust their own work practices in ways that would not be necessary if those coworkers were to more efficiently adapt to remote work.*” These responses reflect the urgency of the pandemic situation and lack of time given to prepare to telework for the respondents and their colleagues, which we tried to capture with the challenge “insufficient time to prepare for remote work.”

Finally, a few other challenges mentioned in the open-ended responses were pandemic-specific, but not telework-specific. Many of these responses concerned very stressful personal and professional realities for employees including “*Feeding my kids with daycare closed,*” “*Uncertainty about duration of situation,*” and “*Constant fear of org-wise[sic] layoffs.*” Some respondents conveyed the impact of school, daycare, and elder care closures and lack of services. For example, one respondent wrote, “*No time for self-care because nights/weekends are used to catch up on work that wasn’t done during the day because I was taking care of my kid*” and another wrote, “*Elderly care - parent with Alzheimers [sic].*” Other respondents expressed challenging emotions: “*I am bored.*” Although these pandemic-specific challenges were not telework challenges, they were likely impacting respondents’ health, well-being, and ability to focus on work during pandemic-induced telework and respondents rated experiencing them more than the other challenges.

Comparing Pandemic-Induced Telework Challenges Between Groups

Our second research question concerned whether some groups of respondents experienced more challenges than others. First, we explored potential differences between those with and without pre-pandemic telework experience (Table 5; Supplemental Table 1). Within our sample, 620 (74%) respondents indicated they had worked from home in some capacity before the pandemic. Independent samples *t*-tests with a Benjamini-Hochberg (B-H, 1995) correction for false discovery using Thissen et al.’s (2002) procedure revealed 9 out of 17 challenges were rated significantly differently by the respondents. For the most part, respondents without pre-pandemic telework experience rated experiencing the challenges to a greater extent compared to respondents with pre-pandemic telework experience. The biggest differences appeared for “little remote work knowledge or experience” and “transitioning work to be online.”

Second, we compared challenge ratings for workers with and without supervisory responsibilities (Table 5; Supplemental Table 2). In our sample, 31% of the respondents identified themselves as a supervisor. Independent samples *t*-tests with the B-H correction revealed that supervisors did not rate any challenges significantly higher than non-supervisors (with the exception of “difficulties

Table 5 A comparison of telework challenge ratings between those with and without telework experience, supervisor status, parenting status, and gender within parents

	Experience <i>d</i>	Supervisor <i>d</i>	Parent <i>d</i>	Parent Gender <i>d</i>
T1 Challenges				
Access to good quality equipment/resources	0.18	0.06	0.04	-0.06
Concerns about personal health & safety	0.18	0.09	0.09	-0.41*
Concerns about information security	0.22*	-0.07	0.10	-0.09
Difficulties coordinating with others	0.16	-0.10	0.00	0.03
Difficulties managing/supervising others	0.05	-0.44*	-0.15	-0.05
Helping children with their schoolwork	0.11	0.00	-1.44*	-0.36*
Insufficient time to prepare for remote work	0.47*	0.08	0.06	-0.42*
Interruptions or distractions in the home environment	0.06	-0.04	-0.69*	-0.23*
Keeping children entertained/cared for	0.23	0.03	-1.66*	-0.21
Lack of control over my work	0.35*	0.08	0.04	-0.27*
Little remote work knowledge or experience	0.86*	0.05	0.09	-0.39*
Missing face-to-face interaction	0.29*	-0.08	-0.04	0.01
Resentment from those who cannot remote work	0.18	-0.03	0.05	-0.09
Resistance to change job procedures	0.50*	-0.05	-0.03	-0.08
Resistance/lack of support from my supervisor	0.29*	-0.09	0.04	-0.15
Technical difficulties due to technology limitations	0.17	0.01	-0.14	-0.28*
Transitioning work to be online	0.60*	0.04	0.07	-0.22
T2 Challenges				
Concerns about information security	0.03	-0.05	0.18	0.03
Concerns about personal health & safety	-0.45	0.12	0.14	-0.45*
Difficulties coordinating with others	0.45	0.26	0.01	0.45*
Interruptions or distractions in the home environment	-0.10	0.11	0.59	-0.10
Lack of control over my work	0.06	-0.01	0.08	-0.06
Missing face-to-face interaction	0.32	0.13	0.11	-0.32

Note. Sample sizes, means, and standard deviations depicted in Supplemental tables. * $p < .05$

managing or supervising others” (Supervisors: $n = 239$, $M = 1.31$, $SD = 1.09$ vs. non-supervisors: $n = 233$, $M = 0.83$, $SD = 1.05$; $t(470) = -4.80$, $p < .05$; $d = -0.44$).

Third, we tested whether there were differences between parents and non-parents and found that beyond the children-specific challenges, parents ($M = 2.43$, $SD = 1.23$) reported experiencing significantly more “interruptions or distractions in the home environment” than non-parents ($M = 1.59$, $SD = 1.19$; $t = -9.58$, $p < .05$; $d = -0.69$; Table 5; Supplemental Table 3). Whereas it is inappropriate to compare these groups on children-specific challenges, it is informative to see how parents rated the children-specific challenges relative to the other challenges.

Table 6 Changes in telework challenge ratings over the first two to three months of the pandemic

Time 1 <i>M (SD)</i>	Time 2 <i>M (SD)</i>	<i>t (df)</i>	<i>d</i>	Challenges <i>N = 337–347</i>
0.53 (0.86)	0.92 (1.01)	$t(336) = -6.70^*$	-0.37	Lack of control over my work
1.03 (1.25)	1.31 (1.25)	$t(340) = -3.82^*$	0.21	Concerns about personal health & safety
1.36 (1.09)	1.54 (1.11)	$t(346) = -3.27^*$	0.18	Difficulties coordinating with others
1.97 (1.24)	2.08 (1.25)	$t(345) = -1.85$	0.10	Interruptions or distractions in the home environment
0.62 (0.96)	0.70 (0.96)	$t(338) = -1.44$	0.08	Concerns about information security
2.42 (1.33)	2.43 (1.26)	$t(344) = -0.19$	0.01	Missing face-to-face interaction

Note. $*p < .05$. Challenges rated on a 5-point extent scale (0 = none, 1 = small, 2 = some, 3 = moderate, or 4 = great). Sample sizes reflect the number of valid responses. “Not Applicable” responses removed from analyses as reflected in the degrees of freedom

We also tested to see if there were differences between men ($n = 222$) and women ($n = 119$) within the parent subsample¹ (Table 5; Supplemental Table 4). Approximately 40% of our sample reported having one or more children aged 18 or younger at home ($n = 342$). As depicted in Supplemental Tables 4, compared to men caregivers, women caregivers rated six T1 challenges significantly higher including “insufficient time to prepare for remote work” and “concerns about personal health and safety.” Additionally, women caregivers rated “helping children with their school-work” significantly higher than men caregivers, but the difference on “keeping children entertained/cared for” did not reach the threshold of statistically significant. At T2, men caregivers rated “difficulties coordinating with others” significantly higher than women caregivers, whereas women caregivers rated “concerns about personal health and safety” significantly higher than men caregivers.

Comparing Telework Challenges Over Time

Our third research question sought to answer the extent to which the prevalence of pandemic-induced telework challenges changed over the first two to three months of the pandemic. Paired corrected *t*-tests for the respondents who rated challenges at T1 and T2 indicated significant increases in three challenges, which are reported in Table 6. Contrary to expectations, many respondents indicated that they experienced challenges to a greater extent at T2 than T1. The biggest increase was for “lack of control over my work,” followed by “concerns about personal health and safety,” and “difficulties coordinating with others.”

Next, we examined the extent to which changes in challenges experienced over time varied for the four previously identified subgroups: experienced teleworkers, parents, men vs. women caregivers, and supervisors (Table 7). To test this, we

¹ Although many of these men and women are likely fathers and mothers respectively, because we did not ask respondents to identify themselves this way explicitly, we refer to them as how they identified themselves in the survey (men and women with one or more children 18 years or younger living in the home).

Table 7 Interaction between time and grouping variable on telework challenges

	T2	T1	T2		T1	T2				
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>		<i>M (SD)</i>	<i>M (SD)</i>				
No Telework Experience (<i>n</i> = 61)			Telework Experience (<i>n</i> = 255)				F ratio	Challenge	partial η^2	
2.85 (1.41)	2.56 (1.42)	2.37 (1.31)	2.43 (1.21)	5.50*	Missing face-to-face interaction	0.02				
1.49 (1.21)	1.66 (1.29)	1.33 (1.08)	1.53 (1.08)	0.09	Difficulties coordinating with others	0.00				
1.77 (1.19)	1.98 (1.22)	2.00 (1.26)	2.10 (1.23)	0.54	Interruptions or distractions in the home environment	0.00				
1.10 (1.39)	1.16 (1.31)	0.99 (1.21)	1.31 (1.23)	1.79	Concerns about personal health & safety	0.01				
0.84 (1.13)	0.75 (0.94)	0.57 (0.92)	0.68 (0.98)	1.74	Concerns about information security	0.00				
0.77 (0.99)	0.98 (1.18)	0.47 (0.80)	0.91 (0.99)	2.46	Lack of control over my work	0.01				
Not Supervisors (<i>n</i> = 215)			Supervisors (<i>n</i> = 101)				F ratio	Challenge	partial η^2	
2.36 (1.39)	2.40 (1.30)	2.67 (1.22)	2.56 (1.15)	1.35	Missing face-to-face interaction	0.00				
1.32 (1.11)	1.47 (1.11)	1.45 (1.09)	1.74 (1.12)	1.50	Difficulties coordinating with others	0.01				
1.94 (1.26)	2.10 (1.24)	2.00 (1.22)	2.02 (1.17)	0.95	Interruptions or distractions in the home environment	0.00				
1.04 (1.29)	1.30 (1.26)	0.94 (1.15)	1.27 (1.21)	1.78	Concerns about personal health & safety	0.00				
0.61 (0.95)	0.67 (0.96)	0.65 (1.01)	0.75 (0.98)	1.12	Concerns about information security	0.00				
0.53 (0.89)	0.93 (1.03)	0.52 (0.78)	0.90 (1.02)	0.04	Lack of control over my work	0.00				
Not Parents (<i>n</i> = 185)			Parents (<i>n</i> = 133)				F ratio	Challenge	partial η^2	
2.39 (1.34)	2.41 (1.26)	2.56 (1.34)	2.53 (1.25)	0.11	Missing face-to-face interaction	0.00				
1.36 (1.12)	1.57 (1.16)	1.37 (1.08)	1.54 (1.06)	0.08	Difficulties coordinating with others	0.00				
1.63 (1.18)	1.82 (1.18)	2.42 (1.20)	2.42 (1.21)	2.15	Interruptions or distractions in the home environment	0.01				
1.12 (1.32)	1.39 (1.25)	0.84 (1.11)	1.13 (1.23)	0.02	Concerns about personal health & safety	0.00				
0.68 (0.98)	0.77 (1.02)	0.54 (0.93)	0.59 (0.88)	0.12	Concerns about information security	0.00				
0.55 (0.89)	0.90 (1.02)	0.50 (0.79)	0.96 (1.03)	0.84	Lack of control over my work	0.00				
Men Caregivers (<i>n</i> = 51)			Women Caregivers (<i>n</i> = 82)				F ratio	Challenge	partial η^2	
2.69 (1.26)	2.73 (1.12)	2.49 (1.39)	2.41 (1.31)	0.27	Missing face-to-face interaction	0.00				
1.51 (1.07)	1.80 (1.02)	1.28 (1.09)	1.38 (1.05)	1.14	Difficulties coordinating with others	0.01				

Table 7 (continued)

T1 <i>M (SD)</i>	T2 <i>M (SD)</i>	T1 <i>M (SD)</i>	T2 <i>M (SD)</i>		
2.16 (1.12)	2.35 (1.18)	2.59 (1.23)	2.46 (1.23)	2.92	Interruptions or distractions in the home environment 0.02
0.69 (1.07)	0.78 (1.08)	0.94 (1.14)	1.34 (1.27)	2.35	Concerns about personal health & safety 0.02
0.59 (0.98)	0.65 (1.00)	0.51 (0.91)	0.55 (0.80)	0.02	Concerns about information security 0.00
0.51 (0.76)	1.02 (1.09)	0.50 (0.82)	0.93 (0.99)	0.18	Lack of control over my work 0.00

Note. Challenges rated on a 5-point extent scale (0 = none, 1 = small, 2 = some, 3 = moderate, or 4 = great). Sample sizes reflect the number of valid responses. “Not Applicable” responses removed from analyses as reflected in the degrees of freedom. * $p < .05$

conducted a mixed MANOVA for each pairing. Consistent with the earlier analysis, respondents rated challenges as even more troubling further into the pandemic. There was not a main effect for telework experience but there was a significant interaction between time and experience on the challenge of “missing face-to-face interaction” ($F=5.51, p<.05$). As depicted by the means in Table 7, workers without pre-pandemic telework experience reported “missing face-to-face interaction” less challenging over time, whereas workers with pre-pandemic telework experience reported this challenge as more impactful over time. Time did not interact with parental status, gender within the parent subsample, or supervisor status.

Telework Strategies

Next, we reported the prevalence of telework strategies. Consistent with Greer and Payne’s (2014) findings, as shown in Table 2, the strategy rated most helpful to respondents was “good quality resources (equipment, internet, etc.)” This was followed by “maintaining regular communications with one’s colleagues and supervisor” and then “making oneself available to his/her supervisor and colleagues.” Other strategies rated highly were “structuring one’s work environment” and “adopting a work-oriented mindset and routine.” Conversely, “getting more accomplished than what was expected” was not rated very highly.

Just as we invited respondents to write in additional challenges they experienced, we also invited them to write in strategies they found helpful that contributed to their ability to work from home effectively. A total of 71 strategies were written in. Most (54; 76%) of these strategies were specific examples of the strategies we listed in the survey. Many respondents mentioned something about having a set schedule which could be captured in the strategy we listed “adopting a work-oriented mindset and routine.” For example, one respondent wrote “*structuring work day*” and another wrote “*maintaining my typical work hours.*” Some respondents incorporated non-work-related activities into their response, perhaps for the purposes of taking a break or resting, reflecting the blurring of work with nonwork (e.g., “*Building in dedicated time in the day that can be flexed toward non-work*”). A good number of responses concerned communication. For example, one respondent wrote “*talking to colleagues regularly*” which we interpreted the same as “maintaining regular communication with my colleagues and supervisor.” Another respondent wrote, “*Having more help with the kids and schoolwork,*” which appears to be a specific example of “securing childcare help.” Another example conveys the extension of care needed for pets as well, “*Trading off animal needs with partner*” or substitutes for care “*Fill dog toys with treats to keep dog busy.*”

Respondents also wrote in a variety of strategies that could be organized into three categories we did not identify in advance: (1) taking breaks and building in time for self-care, (2) obtaining training and/or additional work-related resources, and (3) psychological reframing of the crisis. These first two categories consist of important health- and work-related practices that are relevant regardless of a pandemic, whereas the third one appears to be a more pandemic-specific strategy.

Regarding breaks, some respondents took a structured approach by scheduling them during the workday (e.g., “*Setting time in my calendar for breaks and lunch*”), whereas others just mentioned the importance of just taking them by “*Stepping away from desk for breaks*.” Some respondents also mentioned food and exercise. For example, “*Scheduling exercise and breaks*” and “*Planning my meals and designating certain times to eat*.” The second category of write-in strategies concerned resources to facilitate work (e.g., “*Attending optional tech trainings online provided by my district*”) or physical resources to create boundaries from nonwork (e.g., “*Create google voice number so patients can reach me at home without getting my personal info*” and “*Noise canceling headphones*”). The third category of write-in strategies reflected important tips for managing a stressful situation like a pandemic, which appear to include some cognitive crafting. For example, one respondent wrote “*Acknowledging and accepting fear, sorrow, mourning for old way of life*.” Others wrote “*Letting go of pressure to do it all*,” and “*Humor during the situation*.”

Comparing Telework Strategies Between Groups

Next, consistent with our first research question, we compared the same groups that we compared when examining telework challenges. First, we compared respondents with and without pre-pandemic telework experience. The only strategy on which they differed significantly was “good quality resources (equipment, internet, etc.)”. Those with pre-pandemic telework experience ($M=3.31$, $SD=1.01$) were significantly more likely to report this strategy as contributing to their ability to work from home effectively than those who did not have pre-pandemic telework experience ($M=3.02$, $SD=1.13$; $t=3.15$, $p<.05$; $d=-0.28$). A complete listing of these comparisons appears in Table 8; Supplemental Table 5.

The next groups we compared were those with and without supervisory experience. We found no significant differences between supervisors and non-supervisors on the strategy measures (Table 8; Supplemental Table 6).

Beyond the parent-specific strategies of “trading off tending to children’s needs with my partner” and “securing childcare help,” parents reported significantly higher rates of “adopting a work-oriented mindset and routine”, “getting more accomplished than what was likely expected”, and “structuring my work environment” than non-parents (Table 8; Supplemental Table 7). Despite considerable gender differences among parents in the challenge ratings, there were no significant differences in the strategy ratings (Table 8; Supplemental Table 8).

Supplemental Analyses

Previous research found telework strategies were positively related to work-family facilitation (Greer & Payne, 2014). In this study, we explored how helpful telework strategies were to work-family balance and job performance measured two months later. We found that seven of the eleven strategies had positive significant relationships with work-family balance. Correlations ranged from 0.14 for “making myself available to my supervisor and colleagues” to 0.16 for “maintaining regular

Table 8 Comparison of telework strategy ratings between those with and without telework experience, supervisor status, parenting status, and gender within parents

Telework Strategy	Experience <i>d</i>	Supervisor <i>d</i>	Parent <i>d</i>	Parent Gender <i>d</i>
Adopting a work-oriented mindset and routine	-0.03	0.09	0.21*	0.12
Communicating with people in my home about my availability	0.04	0.13	-0.01	-0.18
Getting more accomplished than what was likely expected	0.03	0.06	0.19*	-0.05
Good quality resources (equipment, internet, etc.)	-0.28*	0.01	0.04	0.10
Maintaining regular communications with my colleagues and supervisor	-0.09	0.03	0.13	-0.07
Making myself available to my supervisor and colleagues	-0.05	0.05	0.13	-0.04
Planning my tasks	0.01	0.11	0.11	-0.24
Securing childcare help	-0.06	0.08	-0.70*	-0.24
Setting goals and prioritizing tasks	-0.05	0.15	0.15	-0.23
Structuring my work environment	-0.09	0.14	0.15*	-0.17
Trading off tending to children's needs with my partner	-0.23	0.02	-1.15*	-0.04

Note. Sample sizes, means, and standard deviations depicted in Supplemental tables. * $p < .05$

communication with my colleagues and supervisor.” Seven strategies were also significantly related to job performance with correlations ranging from 0.10 for “setting goals and prioritizing tasks” to 0.23 for “securing childcare help.” Interestingly, the strategies significantly related to work-family balance were the same as the ones related to job performance with one exception. “Communicating with people in my home” was significantly related to work-family balance but not job performance, whereas “securing childcare help” was significantly related to job performance but not work-family balance. These correlations are presented in Supplemental Table 9.

Discussion

At no other point in history have so many workers been required to telework in order to protect the health and well-being of workers, their family and friends, and the larger community. Our results represent a snapshot of pandemic-induced telework experiences as workers adjusted during the early months of the COVID-19 pandemic. In the current study, we identified the prevalence of telework challenges at the beginning of the COVID-19 pandemic and investigated changes in the following two months. Further, we examined variation in changes experienced for four important groups: (1) workers who had pre-pandemic telework experience, (2) supervisors, (3) parents, and (4) men vs. women caregivers. We also examined which strategies were perceived as most helpful during the first two to three months of pandemic-induced telework. We identified new strategies used by workers to overcome telework challenges during the pandemic. The results of our study offer insights into the feasibility of continued telework practices in the future, as COVID-19 becomes less of a public health threat.

Pandemic-Induced Telework Challenges

Consistent with telework research before the pandemic (Greer & Payne, 2014), the most frequently cited challenge involved “missing face-to-face communication.” Unlike previous research and consistent with speculation by other researchers that boundary violations may be intensified for those sharing their place of work with nonwork role members (i.e., parents; Allen et al., 2021), the challenges of “keeping children entertained and cared for,” as well as “helping children with their schoolwork” were also experienced at high levels. Each of these challenges might be addressed with relational crafting, reflecting the importance of connecting with others and of non-work roles when constraints are imposed and boundaries are blurred.

Our results are consistent with construing pandemic-induced telework as extra-normative work (Calderwood et al., 2023) and situational strength theory (Michel, 1977), which identifies situations with more constraints and consequences and less clarity and consistency as more ambiguous and stressful (Meyer et al., 2010). We found evidence that pandemic-induced telework challenges were significantly less pronounced among workers who had pre-pandemic telework experience and presumably more clarity on how to telework. Not surprisingly, “getting more

accomplished than what was expected” was not rated very highly, likely due to all the anxiety and stress imposed by the pandemic.

The challenges that were not significantly different between those with and without pre-pandemic telework experience can also provide some insight into the most difficult aspects of the pandemic-induced telework experience. Workers with pre-pandemic telework experience reported experiencing many challenges just as much as people who did not have pre-pandemic telework experience (e.g., “technical difficulties due to technology limitations,” “difficulty coordinating with others,” and “difficulty managing or supervising others”.) Although not significant, respondents with pre-pandemic telework experience rated interruptions and the two children-related challenges as more challenging than the respondents without pre-pandemic telework experience, perhaps reflecting that pre-pandemic they did not experience these challenges.

A particularly informative aspect of our study was the examination of challenges over the first two to three months of the pandemic. Respondents rated challenges concerning control over their work, concerns about health and safety and challenges associated with coordinating with others as significantly higher than they did initially. Our data show a similar pattern of increasing challenges for workers with pre-pandemic telework experience, supervisory responsibilities, and children at home (equally for men and women caregivers). Ultimately, the initial adjustment period to pandemic-induced telework involved increasing challenges that were not mitigated for many workers within those first two to three months. This presents novel data about the timeframe over which employees adapt to telework during a crisis. Whereas some researchers propose a period of adaptation (Biron et al., 2022; Limburg, 2003), the duration of this timeframe is unclear. There appeared to be a persistent and increasing need for access to appropriate technologies, coordinating effective communication among coworkers, ensuring the health and safety of workers, and giving workers a sense of control over their work during pandemic-induced telework.

Pandemic-Induced Telework Strategies

Consistent with Greer and Payne’s (2014) finding that access to good quality resources was an extremely important strategy for facilitating telework and overcoming telework challenges, workers in the current study rated this strategy the most helpful for them to work effectively. Maintaining regular communication with one’s supervisor and colleagues was also rated highly, followed by making oneself available to their supervisor and colleagues, structuring the work environment, and adopting a work-oriented mindset and routine. Interestingly, T2 respondents rated these strategies higher at T1, so given the smaller sample size at T2, they may be even more helpful than our data reveal.

Mapping these strategies to job crafting categories previously proposed (Biron et al., 2022), all three types of job crafting are important (see Table 4). Interestingly, these strategies were not specific to pandemic-induced telework. Whereas these strategies were rated as helpful two to three months into the pandemic, respondents

rated all of the challenges higher at T2. This suggests that these strategies were not sufficient for overcoming or reducing the perceived challenges during the initial months of pandemic-induced telework.

Some of these strategies were not equally executable for all employees. For instance, the early months of the pandemic were plagued with inadequate access to computing devices, communication technologies, and internet bandwidth to handle virtual meetings, especially with multiple people in the home who needed these resources for work and school. Similarly, the pandemic highlighted how income inequality impacted telework experiences as access to technology and internet as well as the availability of a dedicated workspace at home were major concerns for some Americans (Maillot et al., 2022; McClain et al., 2021). Likewise, regular communication with colleagues and supervisors is a strategy that may be limited at times during the pandemic due to widespread anxiety, stress, and illnesses. Finally, the ability to structure one's work environment is influenced by the amount of space employees have access to and the number of people they share that space with.

Supplemental correlations between T1 telework strategies and T2 work-family balance and job performance were consistent with previous research. "Securing childcare help" was the strategy with the strongest correlation with job performance, reinforcing pre-pandemic telework recommendations of using dedicated childcare (Greer & Payne, 2014).

Implications

Our research contributes to crisis-specific circumstances and the broader telework literature. Very few studies have tracked teleworkers over time allowing for a within-person examination of change (Allen et al., 2015). The results of the current study suggest that, although context is an important contributor to telework experiences, some challenges are relatively ubiquitous for anyone engaging in telework. We also found evidence of enduring challenges that were not mitigated with traditional telework strategies and likely continued to impact the well-being and productivity of teleworkers during the pandemic.

Our results speak to a larger need for organizations to prepare employees for the challenges of telework, especially as more workers and organizations establish hybrid and permanent remote work arrangements. Pandemic-induced telework highlighted the challenges associated with combining work and nonwork and the importance of interpersonal interactions. In the future, organizations can anticipate and try to mitigate challenges associated with childcare, sharing technological resources with household members, and missing face-to-face in-person interaction. These considerations are important for effective business continuity planning (Federal Emergency Management Agency, 2018).

We advocate for continued research on how to reduce telework challenges. Although traditional telework strategies were rated as helpful in this study; these strategies were not sufficient for reducing challenges during the first two to three months. Open-ended responses to our survey suggested that self-care and attention to psychological well-being were also important for overcoming telework challenges

during the pandemic times. These strategies were less salient in the traditional telework literature and appear to be important strategies highlighted during the pandemic that can positively contribute to the health and well-being of workers.

Limitations and Future Research

We recognize that our research study was predicated on survey respondents who were willing, able, and available to respond to two surveys separated by two months early in the pandemic. It is possible that the workers who were experiencing the most challenging adjustments during that time frame did not have additional capacity to participate in our study and/or complete the T2 survey. In fact, our nonrespondent analyses reflect that nonrespondents to our T2 survey were struggling with challenges a bit more at T1 than T2 respondents. As a result, our estimates of the prevalence of challenges during pandemic-induced telework may be underestimates of the broader population. Also, we did not reassess all the challenges and strategies we assessed at T1 in T2, so there may have been other changes that we did not capture. Future research may be able to capture additional changes in challenges and strategies as many workers continue to telework regularly.

It would also be interesting to track changes in challenges and strategies over multiple occasions for a more-extended time period (e.g., one year) to allow for a more sophisticated analysis of intraindividual change using latent growth modeling and possibly latent profile analyses. It would also be informative to track any other changes occurring at work or in the home at the same time. For example, having other adults in the home to help with nonwork demands (e.g., childcare, meal preparation) can possibly have a significant impact on teleworkers' ability to focus on work demands when working from home.

Our sample consisted of individuals who could work from home and therefore excludes "essential" workers like those in grocery stores and hospitals. The sample was also relatively homogeneous with respect to race/ethnicity and education levels. Whereas we were able to explore the challenges experienced by a new set of teleworkers, the majority (74%) of our sample had teleworked in some capacity before. Therefore, new explorations should seek more demographically diverse samples, with varying levels of telework experience.

The number of telework challenges (17) and strategies (11) measured in this study created statistical challenges for conducting additional analyses, including assessing which variables predict the use of strategies and if certain strategies alleviate certain challenges. It would be informative to determine if certain challenges and/or strategies are more likely to occur together, allowing the creation of teleworker profiles.

Finally, our dichotomization of telework experience may not fully capture the extent to which telework experience can serve as a buffer against the challenges associated with teleworking. This theoretically continuous variable is likely to be an important variable in future research and practice as telework has become more common among many workers. In fact, many employees continue to telework on a regular basis. Accordingly, organizations who want to maintain

a healthy workforce must take note of telework challenges and promote strategies to mitigate those challenges.

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Author Contributions All authors contributed to the study conception and design. Data analysis was conducted by SCP (second author). All authors contributed to writing the manuscript. All authors read and approved the final manuscript.

Data Availability The data that support the findings of this study are available from the second author, [SCP], upon request.

Declarations

Ethics Approval This research study was approved by the Human Research Protection Program at Texas A&M University.

Consent to Participate Informed consent was obtained from all individual participants included in the study.

Consent to Publish This manuscript does not contain individual person's data in any form.

Competing Interests The authors have no relevant financial or non-financial interests to disclose.

References

- Allen, T. D., Golden, T. D., & Shockley, K. M. (2015). How effective is telecommuting? Assessing the status of our scientific findings. *Psychological Science in the Public Interest*, 16(2), 40–68. <https://doi.org/10.1177/1529100615593273>
- Allen, T. D., Merlo, K., Lawrence, R. C., Slutsky, J., & Gray, C. E. (2021). Boundary management and work-nonwork balance while working from home. *Applied Psychology*, 70(1), 60–84.
- Bailey, D. E., & Kurland, N. B. (2002). A review of telework research: Findings, new directions, and lessons for the study of modern work. *Journal of Organizational Behavior: The International Journal of Industrial Occupational and Organizational Psychology and Behavior*, 23(4), 383–400. <https://doi.org/10.1002/job.144>
- Belzunegui-Eraso, A., & Erro-Garces, A. (2020). Teleworking in the context of the COVID-19 crisis. *Sustainability*, 12(9), 3662. <https://doi.org/10.3390/su12093662>
- Benjamini, Y., & Hochberg, Y. (1995). Controlling for false discovery rate: A practical and powerful approach to multiple testing. *Journal of the Royal Statistical Society Series B*, 57, 289–300.
- Berghammer, C. (2022). Childcare and housework during the first lockdown in Austria: Traditional division or new roles? *Journal of Family Research*, 34(1), 99–133.
- Bianchi, S. M., Sayer, L. C., Milkie, M. A., & Robinson, J. P. (2012). Housework: Who did, does or will do it, and how much does it matter? *Social Forces*, 91, 55–63.
- Biron, M., Casper, W. J., & Raghuram, S. (2022). Crafting telework: A process model of need satisfaction to foster telework outcomes. *Personnel Review*, ahead-of-print. <https://doi.org/10.1108/PR-04-2021-0259>
- Bordia, P., Hobman, E., Jones, E., Gallois, C., & Callan, V. J. (2004). Uncertainty during organizational change: Types, consequences, and management strategies. *Journal of Business and Psychology*, 18(4), 507–532.
- Calderwood, C., Meyer, R. D., & Minnen, M. E. (2023). Situational strength as a lens to understand the strain implications of extra-normative work. *Journal of Business and Psychology*, 38, 637–655.

- Carillo, K., Cachat-Rosset, G., Marsan, J., Saba, T., & Klarsfeld, A. (2021). Adjusting to epidemic-induced telework: Empirical insights from teleworkers in France. *European Journal of Information Systems*, 30(1), 69–88. <https://doi.org/10.1080/0960085X.2020.1829512>
- Clark, S. C. (2000). Work/family border theory: A new theory of work/family balance. *Human Relations*, 53(6), 747–770.
- Federal Emergency Management Agency (2018). Continuity guidance circular. https://www.fema.gov/sites/default/files/2020-07/Continuity-Guidance-Circular_031218.pdf. Accessed 1 Apr 2023.
- Greer, T. W., & Payne, S. C. (2014). Overcoming telework challenges: Outcomes of successful telework strategies. *The Psychologist-Manager Journal*, 17(2), 87–111. <https://doi.org/10.1037/mgr0000014>
- Hammer, L. B., Neal, M. B., Newsom, J. T., Brockwood, K. J., & Colton, C. L. (2005). A longitudinal study of the effects of dual-earner couples' utilization of family-friendly workplace supports on work and family outcomes. *Journal of Applied Psychology*, 90(4), 799–810. <https://doi.org/10.1037/0021-9010.90.4.799>
- Ingusci, E., et al. (2021). Workload, techno overload, and behavioral stress during COVID-19 emergency. The role of job crafting in remote workers. *Frontiers in Psychology*, 12, 655148. <https://doi.org/10.3389/fpsyg.2021.655148>
- Jenkins, F., & Smith, J. (2021). Work-from-home during COVID-19: Accounting for the care economy to build back better. *The Economic and Labour Relations Review*, 32(1), 22–38. <https://doi.org/10.1177/1035304620983608>
- Kerman, K., Korunka, C., & Tement, S. (2022). Work and home boundary violations during the COVID-19 pandemic: The role of segmentation preferences and unfinished tasks. *Applied Psychology*, 71(3), 784–806. <https://doi.org/10.1111/apps.12335>
- Kossek, E. E., Thompson, R. J., & Lautsch, B. A. (2015). Balanced workplace flexibility: Avoiding the traps. *California Management Review*, 57(4), 5–25. <https://doi.org/10.1525/cmr.2015.57.4.5>
- Kreiner, G. E., Hollensbe, E. C., & Sheep, M. L. (2009). Balancing borders and bridges: Negotiating the work-home interface via boundary work tactics. *Academy of Management Journal*, 52(4), 704–730. <https://doi.org/10.5465/amj.2009.43669916>
- Krukowski, R. A., Jagsi, R., & Cardel, M. I. (2021). Academic productivity differences by gender and child age in science, technology, engineering, mathematics, and medicine faculty during the COVID-19 pandemic. *Journal of Women's Health*, 30(3), 341–347. <https://doi.org/10.1089/jwh.2020.8710>
- Limburg, D. O. (2003). Learning to telework: Self-reflection and learning in the process of introducing telework in an organization. In B. Rapp, & P. Jackson (Eds.), *Organization and work beyond* (pp. 117–133). Physica-Verlag.
- Mailhot, A. S., Meyer, T., Prunier-Poulmaire, S., & Vayre, E. (2022). A qualitative and longitudinal study on the impact of telework in times of COVID-19. *Sustainability*, 14(14), 8731.
- Mäkikangas, A., Juutinen, S., Mäkinen, J. P., Sjöblom, K., & Oksanen, A. (2022). Work engagement and its antecedents in remote work: A person-centered view. *Work & Stress*, 36(4), 392–416. <https://doi.org/10.1080/02678373.2022.2080777>
- McClain, C., Vogels, E. A., Perrin, A., Sechopoulos, S., & Rainie, L. (2021). The Internet and the pandemic. PEW Research Center. <https://www.pewresearch.org/internet/2021/09/01/the-internet-and-the-pandemic/>. Accessed 1 Apr 2023.
- Meyer, R. D., Dalal, R. S., & Hermida, R. (2010). A review and synthesis of situational strength in the organizational sciences. *Journal of Management*, 36(1), 121–140. <https://doi.org/10.1177/0149206309349309>
- Milliken, F. J. (1987). Three types of perceived uncertainty about the environment: State, effect, and response uncertainty. *Academy of Management Review*, 12(1), 133–143.
- Mischel, W. (1977). The interaction of person and situation. In D. Magnusson, & N. S. Endler (Eds.), *Personality at the crossroads: Current issues in interactional psychology* (pp. 333–352). Lawrence Erlbaum.
- Pérez, M. P., Sánchez, A. M., & de Luis Carnicer, M. P. (2002). Benefits and barriers of telework: Perception differences of human resources managers according to company's operations strategy. *Technovation*, 22(12), 775–783.
- Pleck, J. H. (1977). The work-family role system. *Social Problems*, 24, 417–427. <https://doi.org/10.2307/800135>
- Raghuram, S., Wiesenfeld, B., Garud, R., & Gupta, V. (2001). Factors contributing to virtual work adjustment. *Journal of Management*, 27, 383–405.

- Shockley, K., Allen, T. D., Dodd, H., & Waiwood, A. M. (2020). *Rapid transition to remote work during COVID-19: A study of predictors of employee well-being and productivity*. Report to the National Science Foundation. <http://iwillugaresearch.wixsite.com/website/publications>. Accessed 1 Apr 2023.
- Thissen, D., Steinberg, L., & Kuang, D. (2002). Quick and easy implementation of the Benjamini-Hochberg procedure for controlling the false positive rate in multiple comparisons. *Journal of Educational and Behavioral Statistics*, 27(1), 77–83.
- Wrzesniewski, A., & Dutton, J. E. (2001). Crafting a job: Revisioning employees as active crafters of their work. *Academy of Management Review*, 26(2), 179–201. <http://www.jstor.org/stable/259118>
- Zacher, H., & Rudolph, C. W. (2021). Individual differences and changes in subjective wellbeing during the early stages of the COVID-19 pandemic. *American Psychologist*, 76(1), 50–62. <https://doi.org/10.1037/amp0000702>
- Zerubavel, E. (1991). *The fine line: Making distinctions in everyday life*. Free Press.

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