Work-From-Home Performance During the Pandemic: How Technology Availability Moderates Job Role, Stress and Family-Work Conflict

Jane Fedorowicz, Safa'a Abujarour, Haya Ajjan, Dawn Owens

Work-From-Home Performance During the Pandemic: How Technology Availability Moderates Job Role, Stress and Family-Work Conflict

Jane Fedorowicz[1], Safa'a AbuJarour[2], Haya Ajjan[3], Dawn Owens[4]

[1] Bentley University, USA ORCID 0000-0002-2953-6146
[2] An-Najah National University, Palestine
[3] Elon University, USA
[4] University of Texas at Dallas, USA
safaa.abujarour@najah.edu

Abstract. Employees working from home (WFH) during the COVID-19 pandemic turned to an array of information and communications technologies (ICT) to support at-home job performance. This study documents the role of ICT in enabling these workers and managers to abruptly transition to WFH and explores the barriers and challenges they faced in working remotely. The goal of the study is to address the research question: How did ICT availability affect the relationship between personal work environment factors (i.e., job role, stress, and family-work conflict) and job performance while WFH due to the onset of the COVID-19 pandemic? We also report on how workers adjusted their ICT usage (hardware, software and Internet access) when moving to remote work. We then compare workers' ICT usage, job performance, and personal stressors across manager and non-manager roles. Our findings from survey responses from 545 workers in 36 countries record a range of personal and professional challenges employees faced when forced to WFH, including whether employer ICT support has successfully met their needs. Our findings will inform employer efforts to establish new WFH policies.

Keywords: ICT, Working From Home, WFH, COVID-19, Pandemic, Survey, Technology Availability, Job Performance.

1 Introduction

As the COVID-19 pandemic spread around the world in early 2020, a large percentage of the global workforce was forced to work from home (WFH) on short notice. For those working in data-centric fields where information is the central commodity, a key enabler of the move to WFH was information and communication technology (ICT). However, many workers were not equipped with the technology they needed to maintain their in-office job performance (Galanti et al., 2021; Morikawa, 2022). Only 22% of respondents to a study by Deloitte said that their organizations supplied the technologies they needed to facilitate remote working before the pandemic, and 42% of organizations planned to invest in new technologies and systems that support re-

mote working in the future (Deloitte, 2021). And while ICT is key to moving people to a remote location, there are many other environmental and personal hurdles facing remote workers that also must be overcome (Morikawa, 2022). As the physical location of jobs and family life intersect, companies will be well served to identify and support best practices on supporting home-based employees in many possible crisis situations (Choudhury, Koo, and Li, 2020).

The purpose of this study is to document the role of ICT in enabling workers and managers to abruptly transition to WFH due to the global COVID-19 pandemic, and to explore the barriers and challenges these employees faced in working remotely. To do so, we report on the results of an online survey administered soon after the COVID-19 WFH phenomenon began. The study examines the relationship between the technologies available to support remote work and the personal work environment employees contend with when moving to home-based work, and how both affect worker performance. We describe the types and characteristics of technologies used by WFH employees to demonstrate the gulf between office ICT support and employees' home technology setup. We identify those areas where managers and non-managers differed in their ICT-supported WFH performance. We document the effects of stress and family-work conflict on worker performance and suggest that ICT availability can help to ameliorate the impact of these personal environmental factors. To do so, the study first looks at how workers' ICT usage (hardware, software, and Internet access) changed due to WFH during the COVID-19 pandemic. With knowledge of these changes, we then address the following research question:

- *How did ICT availability affect the relationship between personal work environment factors (i.e., job role, stress, and family-work conflict) and job performance while WFH due to the onset of the COVID-19 pandemic?*

2 Related Work

2.1 Working From Home during COVID-19

Office work has evolved to be conducted anywhere and anytime due to its reliance on ICT (Rahim, Rahman, and Iahad, 2018). Environmental and economic factors, such as high operating costs, globalization, and changing workforce demographics, also encouraged the transition to the virtual office (Calvasina, Calvasina, and Calvasina, 2012; Meinert, 2011).

Although not a new notion, WFH was never adopted to the extent forced by the COVID-19 crisis. In addition to causing acute economic and life disruption at an unprecedented scale and rate worldwide (Gopinath, 2020), COVID-19 revolutionized the WFH concept by accelerating the move towards remote working (The Economist, 2020). About a third of the workforce in the U.S. changed to WFH (Brynjolfsson et al., 2020) and half of Europeans were thought to be WFH at the outset of the pandemic (Ahrendt, 2020). As organizations look to the future, many are planning to stay virtual or adopt a hybrid virtual model that combines remote work with time in the office (Paul, 2020; Alexander et al., 2021). Given the widespread and abrupt move to

WFH, and companies' continued commitment to supporting this workplace alternative, it is crucial to study how WFH during COVID-19 affects employees in their job-related tasks as well as their personal lives.

The transition to WFH during the COVID-19 pandemic was not easy. Over 70% of employees reported struggling to shift to remote work (Hutzler, 2020). Of those, 80% cited the transition to a digital work environment as a challenge (Hutzler, 2020). Early in the pandemic, productivity was a concern, however, new research has found that IT innovations related to WFH have facilitated an increase in productivity (Criscuolo et al., 2021). But much depends on the tasks being performed and the WFH environment (Criscuolo et al., 2021). In summary, while there is progress, there are still circumstances and challenges that affect employee performance.

Job Role: Managers vs. Non-managers

Both managers and non-managers moved to remote working under the same circumstances. However, there may be differences in how each group reacts to their work settings. Research has shown that managers experience more ICT-induced stress than non-managers (Boyer-Davis, 2019; Stadin et al., 2020) but work-related stress may be lower (Peter et al., 2020; Skaken et al., 2011). In addition, managers experience greater work-life conflict but higher job satisfaction (Peter et al., 2020). Managers' personality traits might also indicate a differential impact on their job performance. Managers have been shown to score higher on measures of emotional stability than non-managers, and emotional stability is known to be related to job performance (Tett et al., 2000; Salgado, 1997; Lounsbury et al., 2016). Managers are held to be more accountable than non-managers for organizational performance (Factor, Oliver, and Montgomery, 2013) and therefore may find that their own performance diminishes as their own and their reports' work is affected by WFH challenges. Evidence does confirm a negative relationship between supervisory status and WFH job performance in the public sector during the current pandemic (Fischer et al., 2022).

As many of these findings were based on traditional working environments, it would be useful to assess if these differences persist when employees (including managers) are forced to WFH. This motivates our first hypothesis:

- *H1: Job performance will differ for managers and non-managers while forced to WFH.*

Stress

A significant concern during the pandemic is that WFH can increase symptoms of stress in those working from home, causing negative impacts on their emotional well-being (Golden, 2009; Fornara et al., 2021; Galanti et al., 2021; Moss, 2021). Even prior to the pandemic, research documented the challenges around balancing work and family responsibilities, resulting in increased stress levels (Dockery and Bawa, 2014; Pfeffer, 2018). Although WFH is positively related to overall job satisfaction because of the increased flexibility of achieving work-related tasks, it leads to more job-induced stress and negative personal well-being due to work overload and work-life conflicts (Anderson, Kaplan, and Vega, 2015; Hayman, 2010). Moreover, having more job flexibility and autonomy requires greater effort from workers to manage

their time at home and this is channeled into their work, causing adverse effects and work-related stress (Curzi, Pistoresi, and Fabbri, 2020; Moss, 2021).

WFH also can generate health concerns, some resulting from workers tending to work too much while at home rather than too little (Nickson and Siddons, 2004; Pfeffer, 2018; Moss, 2021). This tendency towards long hours for some can also result in family-work conflicts (Callister, 2003).

In addition to job-related adaptation, COVID-19 created a new set of challenges because the entire household unit was in self-isolation together (Vyas, 2022). Workers had to develop personal and professional strategies to mitigate the stressful psychological costs from an unanticipated switch to WFH, especially given insufficient time or capacity to effectively manage the trade-off among their work, social and home roles (Choudhury, Koo, and Li, 2020; Moss, 2021; Fornara et al., 2021).

In summary, stress is known to be linked to lowered job performance (e.g., Jamal, 1985). It is likely that stress levels will increase when WFH, which may further affect an employee's work performance. Hypothesis 2 reflects this prospect.

- *H2: An increased stress level will have a negative impact on job performance as employees are forced to WFH.*

Family-work Conflict

Family-work conflict is the degree to which responsibilities from the family and work domains are incompatible (Greenhaus and Beutell, 1985). Conflicts happen when wide-ranging family and work demands cut across each other, resulting in negative performance consequences (Voydanoff, 2005). Family-work integration increases both family-to-work conflict and work-to-family conflict, and an inability to disengage from work increases work-to-family conflict (Eddleston and Mulki, 2017). Family-work conflict has been shown to be negatively correlated to WFH productivity during the pandemic (Galanti et al., 2021).

Family-work-role conflict comprises time-based, strain-based, and behavior-based reflecting an individual's scarce time and energy resources (Netemeyer, Boles, and McMurrian, 1996; Greenhaus and Beutell, 1985). Time-based conflict is the time demanded by one's family roles and responsibilities such as children, spouse, or parent as distinct from time demanded by work-related tasks (Netemeyer, Boles, and McMurrian, 1996; Greenhaus and Beutell, 1985). A strain-based conflict results from the anxiety and stress stemming from performing family and work duties (Netemeyer, Boles, and McMurrian, 1996; Greenhaus and Beutell, 1985). A behavior-based conflict exists when role demands, such as self-reliance and emotional stability, make it harder to fulfill other roles, such as emotional vulnerability and warmth (Greenhaus and Beutell, 1985).

We base the family-work conflict construct used in our study on time-based, strain-based, and behavior-based family-work items. We examine this in Hypothesis 3:

- *H3: Family-work conflict will have a negative impact on job performance as employees are forced to WFH.*

Employing ICT while WFH

During the COVID-19 lockdown, billions of people were forced to instantly adopt the digital technologies that facilitate communication, data acquisition, research and development, and management to remain productive and efficient (Kamal, 2020). Remote teams rely on ICT to communicate, which requires a stable Internet connection to support email, teleconferencing, and document sharing services (McKeown, 2016). ICT supports business continuity by maintaining information exchange and enabling business processes, making it a critical tool for WFH particularly in emergency situations. ICT plays a significant role in enabling WFH and coping with negligible work-home boundaries (Cousins and Robey, 2005; Gerlach, 2018; Golden and Geisler, 2007; Kreiner, 2006). However, while ICT creates many advantages to enhance worker performance, it can also trigger workplace stress, role overload, and technostress (Ashforth, Kreiner, and Fugate, 2000; Boyer-Davis, 2019; Sarker et al., 2012; Tarafdar et al., 2007). The "always-on" functionality of technology-based tools makes it difficult to switch off work while WFH (McKeown, 2016). While ICT accessibility distinctions can enable work-life boundaries in normal times, they are less feasible during the COVID-19 pandemic. Studies (e.g., Pan, Cui, and Qian, 2020) observed that the rapid lockdown produced great challenges for individuals due to the pressure to adapt to a new online- and home-centered life.

Thus, technology availability may be both an enabler of and a source of conflict for employees who WFH. In our study, we differentiate among three categories of ICT artifacts – Internet access, hardware availability and software availability. The closure of offices created a physical challenge to employee access to hardware during the pandemic, even as software could be distributed online (Galanti et al., 2021). In addition, Internet accessibility is constrained by what is available geographically and financially to employees. Hypotheses 1, 2 and 3 will be examined in light of each of these three ICT categories to ascertain whether ICT availability augments or diminishes the relationship between personal environmental WFH characteristics and job performance. Table 1 contains both the direct and moderated hypotheses that address the study's research question.

Demographic Factors relating to WFH

Trends noted during the pandemic suggest that personal work environment factors may account for some of the job performance differences we expect in our analysis. After testing these hypotheses, we report on relationships in the results that may be linked to age, gender, or family caretaking status of the respondents.

Older workers are more experienced in their jobs and are less likely to have conflicting obligations for dependent care. They may also be less comfortable or practiced with having to switch from in-person to online communications. They have been found to have lower job performance in previous studies (Rhodes, 1983; Rodríguez-Cifuentes et al., 2018). However, age was found to correlate both with higher WFH performance (Fischer, 2022) and lower WFH productivity (Galanti et al., 2021) during the pandemic. Thus, it is unclear what relationship we might expect of age as a control variable in this study.

There is no doubt that both working men and women have been adversely impacted by the stay-at-home order during the pandemic. Studies have repeatedly shown that working women may have a harder time balancing work and home because women are typically responsible for more of family or home caretaking, even when they earn more than their partner (Craig and Sawrikar, 2009). In addition, the link between ICT usage and negative home-to-work spillover has been noted for women, but not for men (Chesley, 2005).

Table 1. ICT Moderation Hypotheses

Hypothesis 1	**Job performance will differ for managers and non-managers while forced to WFH.**
Hypothesis 1a	The relationship between job role and job performance differs based upon available internet speed.
Hypothesis 1b	The relationship between job role and job performance differs based upon the provision of needed hardware.
Hypothesis 1c	The relationship between job role and performance differs based upon the provision of needed software.
Hypothesis 2	**An increased stress level will have a negative impact on job performance as employees are forced to WFH.**
Hypothesis 2a	The negative effect of stress level on job performance is worsened for employees with slower internet speed.
Hypothesis 2b	The negative effect of stress level on job performance is worsened for employees who were not provided with needed hardware.
Hypothesis 2c	The negative effect of stress level on job performance is worsened for employees who were not provided with needed software.
Hypothesis 3	**Family-work conflict will have a negative impact on job performance as employees are forced to WFH.**
Hypothesis 3a	The negative effect of family-work conflict level on job performance is worsened for employees with slower internet speed.
Hypothesis 3b	The negative effect of family-work conflict level on job performance is worsened for employees who were not provided with needed hardware.
Hypothesis 3c	The negative effect of family-work conflict level on job performance is worsened for employees who were not provided with needed software.

During the pandemic, many women took on added responsibility for caring for children, elderly parents, and the home. When given flexible work arrangements, men are expected to improve work performance, while women are expected to increase their caretaking responsibilities, which increase their family-work conflict (Chung and van

der Lippe, 2018). Prior research has shown that when WFH, total hours worked for women increases dramatically (Dockery and Bawa, 2014), and this leads to more family-work conflict (van der Lippe and Lippényi, 2018). Early in the pandemic, mothers with children under 13 reduced their work hours four to five times more than fathers (Collins et al., 2020). However, gender alone may not predict performance decrease, as at least one study found women in government roles experienced an increase in performance during the pandemic shutdown (Fischer et al., 2022). We expect that women, especially those who are responsible for caretaking of family members, will experience higher levels of stress and family-work conflict than men or those without family caretaking obligations, and this will affect their performance.

These demographic factors will be evaluated after the hypotheses in Table 1 to suggest personal characteristics that may drive differences noted by job role, stress, and family-work conflict.

3 Research Design

Our conceptual model (shown in Figure 1) reflects the hypotheses listed in Table 1. The model depicts the expected moderating relationship of ICT between job role, stress level, and family-work conflict and job performance. The model will test whether ICT can ameliorate the effects of these personal environmental factors, to specifically identify the benefits (or costs) that ICT provision (or lack) adds when employees' work environment becomes dispersed.

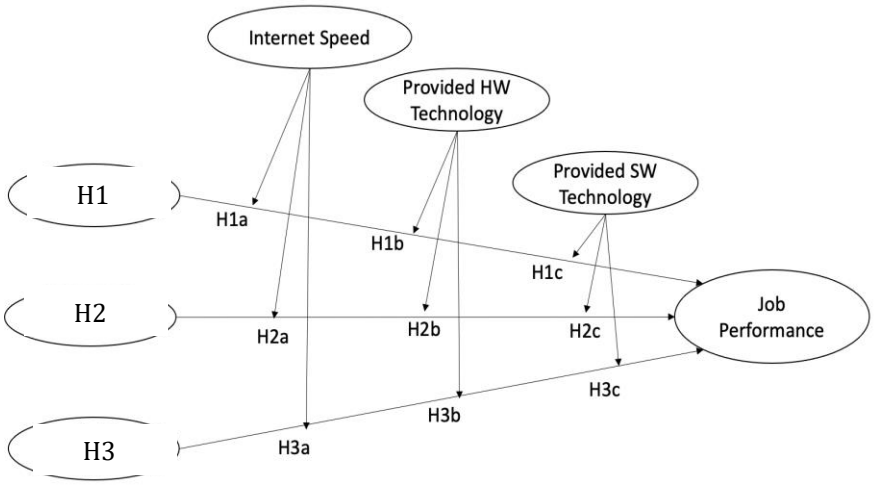

Figure 1. Conceptual Model

4 Methodology and Sampling

We developed an online survey instrument using Qualtrics to collect data from employees who have had to move their jobs home during the COVID-19 pandemic. The survey instrument, which was approved by a university institutional review board, combined demographic questions with items characterizing the WFH environment and covering employees' current use of technology. In line with previous literature assessing technology availability (Bélanger, Collins, and Cheney, 2001; Prezza, Pacilli, and Dinelli, 2003), we asked respondents whether they had access to needed ICT including high-speed Internet, and whether the company has provided access to adequate WFH-enabling hardware and software.

We measured family-work conflict experienced by the employees using a five-item scale measuring the demands of family (Netemeyer, Boles, and McMurrian, 1996). We asked employees to assess their stress levels before and during the pandemic. We measured job performance using a three-item scale from Becker, Billings, Eveleth, and Gilbert (1996) that is commonly used to analyze people's work outcomes. Demographic variables included the person's gender, age, and caregiver status. Each respondent also indicated their job role (as manager or non-manager).

A pilot test of the survey was conducted using a convenience sample. Due to the desire to reach a large and disparate global audience for the full survey, we employed a combination of social media channels and email distribution lists to reach a wide online audience. Personal connections also shared the survey with their professional contacts, creating a snowball distribution network. The final version of the questionnaire was distributed over these channels during the 12-day period of April 27 to May 8, 2020.

We obtained a total of 545 usable responses from 36 countries. 456 of the respondents were living with others. Of these, 21.4% reported they are mainly responsible for family/home caretaking, 41% are not the main family/home caretakers, and 34% had equally distributed responsibilities (3% had missing responses). Table 2 reports on the demographic characteristics of the respondents. For privacy reasons, demographic questions included an option for those choosing not to respond, resulting in a small number of missing values for those items.

Table 2. Demographic Information

Description	Frequency	Percent	Description	Frequency	Percent
Gender			**Job role**		
Male	210	38.5	Management	134	24.6
Female	326	59.8	Non-Management	405	74.3
Other/ Missing	9	1.7	Missing	6	1.1
Age			**Country (Top 6 of 36 are shown here)**		
18-24	57	10.5	United States	240	44.0
25-34	128	23.5	Germany	192	35.2
35-44	125	22.9	Greece	22	4.0
45-54	104	19.1	Mexico	13	2.4
55-64	105	19.3	Canada	7	1.3
65 or older	19	3.5	Egypt	6	1.1
Missing	7	1.3	Other	58	10.6
			Missing	7	1.3
Marital status			**Living Alone**		
Single	169	31.0	Yes	89	16.3
Married/In Partnership	369	67.7	No	456	83.7
Missing	7	1.3			

5 Results

We first present descriptive statistics capturing WFH trends in technology use. Then, we perform a hierarchical regression analysis to examine the main study variables in three models to control for the selected variables. All analysis was conducted using SPSS.

5.1 Descriptive Statistics

Technology Usage

We asked participants to compare their current use of ICT to before the stay-at-home order, by enquiring about their use of teleconferencing tools, VPN, productivity tools, company applications, and shared storage. As expected, reliance on ICT increased for many of the respondents, with few reporting a decrease in ICT use (See Figure 2). The largest increase was in use of teleconferencing technologies such as Zoom, Skype, GotoMeeting, Webex, and Microsoft Teams. This was unsurprising given the forced isolation of this population.

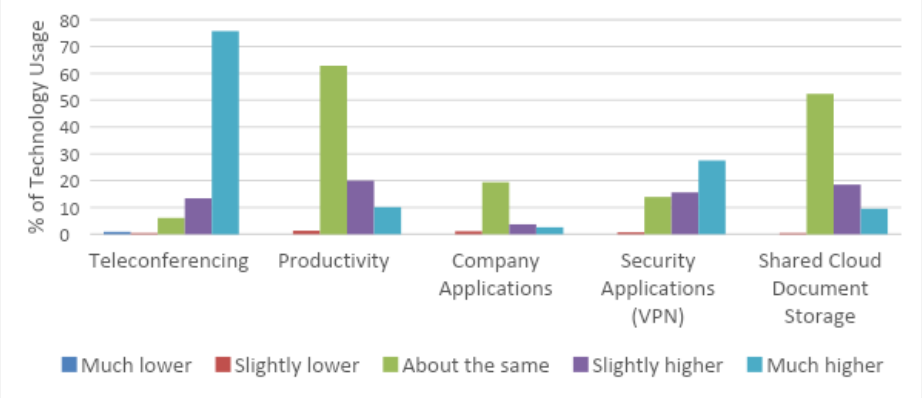

Figure 2. % of Respondents Technology Usage Compared to the Time Before the "Stay-at-Home" Order

We also noted an increase in productivity tool usage (e.g., Word, PowerPoint, Google Docs, Project Management, Calendar, Email), with over half of the respondents saying they used them about the same and another third using them somewhat more or much more than before WFH. Of the relatively few working with company applications at home (e.g., SAP, Quickbooks, CRM), usage stayed the same for most, with some noting they used these more or much more. Over half of respondents reported the use of security applications like Virtual Private Networks (VPN) once they began to WFH, and of these, most reported an increase in use, again not surprising given their reliance on remote access. Finally, most respondents reported using shared cloud document storage while at home, with most acknowledging accessing the cloud as much or more than before WFH. Some respondents also mentioned "Other" tools they used while WFH such as project management, software development and screen recording tools.

5.2 Regression Analysis

Table 1 lists the three sets of hypotheses that address our research question: *How did ICT availability affect the relationship between personal work environment factors (i.e., job role, stress, and family-work conflict) and job performance while WFH due to the onset of the COVID-19 pandemic?*

A hierarchical regression analysis that incorporates the personal environment, ICT and job performance variables tests the model in Figure 1. To do so, several categorical variables were dummy coded: job role (manager (reference group) and non-manager), hardware available (adequate (reference group) and inadequate), and software provided (adequate (reference group), and inadequate). To control for respondent characteristics, we included three additional variables used in previous work-related perception studies (e.g., Agle et al., 1999; Keyes, 2002; Brammer et al., 2007; Factor et al. 2013; Scandura and Lankau, 1997): age, gender (female (reference

group), and family responsibility/main caregiver (yes (reference group), no, and equally divided).

Measurement Model

The reliability of all multi-item constructs was assessed using Cronbach's alpha. Cronbach's alpha coefficient ranged from 0.83 to 0.94, all greater than 0.7 (Nunnally, 1978). The correlations among the variables ranged from 0.26 to 0.02, indicating no evidence of multicollinearity (r's >0.8). Convergent and discriminant validity of all scales were evaluated. Factor loading of all items in the family-work conflict and performance constructs exceeded 0.7, providing evidence for convergent validity. The AVE scores exceeded 0.5, with family-work conflict (AVE= 0.81) and for job performance (AVE= 0.745).

Regression Results

Three hierarchical regression analyses were used to assess the ability of the independent variables together in predicting performance. For each regression model, we ran three regression levels (control, main effect, and interactions) including a new set of variables at each level.

The first regression analysis included demographics control variables (age, gender and family responsibility status). In the second model, we included the main effect variables, job role, stress, family-work conflict and the relevant ICT variable (for example, access to high-speed Internet). In the third model we included three interaction terms calculated using a product term with each of the main effect variables with the specific ICT variable. To minimize the effect of multicollinearity, we centered all main effect variables to calculate the product term (Edwards and Lambert, 2007).

ICT Moderation Model for Internet Speed

In step 1, analysis of the controls (gender, age, family responsibility status=yes, main caregiver= equal), age (B= 0.15, P<0.01), main caregiver= No (B=0.64, P<0.01), and main caregiver=Equal (B=0.34, P<0.01) all predicted performance, as shown in Table 3.

Table 3. Hierarchical Regression Analysis for Internet Speed Predicting Job Performance

	Model 1		Model 2		Model 3	
	B	**Std. Error**	**B**	**Std. Error**	**B**	**Std. Error**
Gender = Female	-0.03	0.09	0.02	0.07	0.02	0.07
Age	0.15**	0.03	0.06*	0.03	0.07**	0.03
Family Responsibility = No	0.64**	0.11	0.22*	0.09	0.22*	0.09
Family Responsibility = Equal	0.34**	0.11	0.18*	0.09	0.18*	0.09
Role= Not Management			-0.27**	0.08	-0.27**	0.08
Stress			-0.09**	0.03	-0.09**	0.03
Family-work conflict			-0.42**	0.03	-0.42**	0.03
Internet Speed			0.13*	0.06	0.11	0.06
Internet Speed X Role					0.10	0.14
Internet Speed X Stress					-0.09	0.05
Internet Speed X Conflict					0.12*	0.05
R^2	0.11		0.45		0.46	
Change in R^2	0.11		0.34		0.01	
F Change	13.09**		64.44**		2.43	

*p < .05. ** p < 01, n= 422

In step 2, the main effects for job role = Not Management (B=-0.27, P<0.01), family-work conflict (B= -0.42, P<0.01), and stress (B=-0.09, P<0.01) all predicted job performance. Thus, the main hypotheses H1, H2, and H3 were supported.

Internet speed (B=0.13, P<0.05) was also significant in Step 2. Hypotheses 1a, 2a, and 3a proposed a moderator role for Internet speed between job role, stress, and family-work conflict and performance.

In the final step, the entry of three interaction terms contributed to a small added explained variance that is not significant (change in R2 = 0.01, P=0.06). Job role's interaction with Internet speed (B=0.09, P=0.49) and stress interaction with Internet speed (B=0.10, P=0.08) were not significant in predicting job performance (H1a, H2a). However, family-work conflict interaction with Internet speed (B=0.12, P<0.05) was significant in predicting job performance (H3a).

To further analyze differences in the interaction term, we examined the performance means across the interaction term in Figure 3. We reviewed the job performance scores at a combination of the mean +/- 1 SD (high and low levels) for family-work conflict at three levels of Internet speed (slow, acceptable, and fast). The figure shows that the negative relationship between family-work conflict and job performance is worsened by slow Internet speed, thus supporting hypothesis H3a. Hypotheses 1a and 2a were rejected due to the insignificant interaction effect; a non-management job role and increased stress are associated with negative job performance regardless of Internet speed.

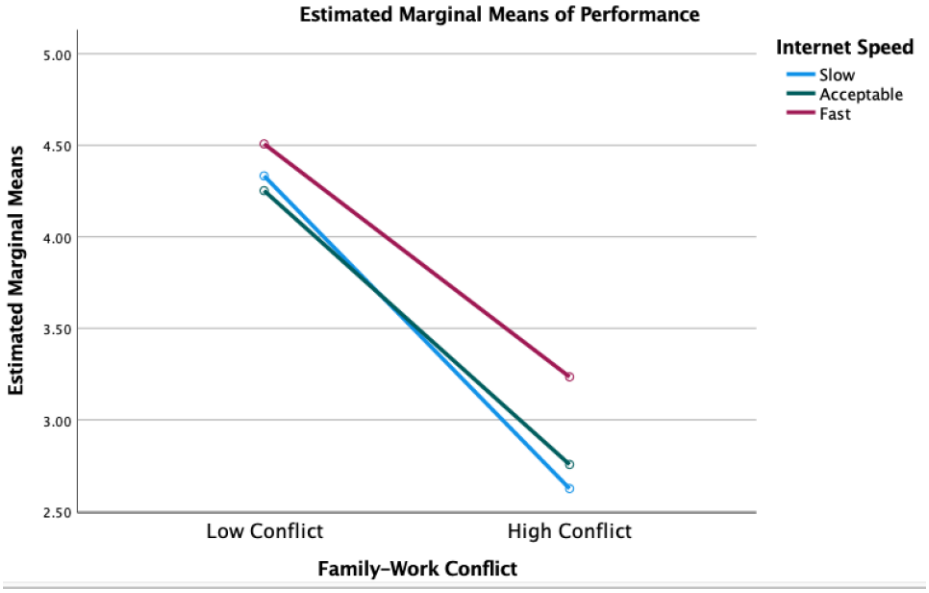

Figure 3. Internet Speed's Moderation of Family-Work Conflict's Impact on Performance

ICT Moderation Model for Hardware

We next evaluate the moderating role of adequate hardware support between job role (hypothesis 1b), stress (hypothesis 2b), family-work conflict (hypothesis 3b) and job performance. As shown in Table 4, job role (B=-0.26, P<0.01), stress (B=-0.10, P<0.01), and family-work conflict (B= -0.42, P<0.01) all predict job performance, supporting the main effects noted in H1, H2 and H3. Hardware availability (B=-0.19, P<0.05) was also significant.

The entry of three interaction terms contributed to added explained variance (change in R2 = 0.01, P<0.05). We find the interaction of available hardware and role (H2a, B=-.43, P<0.05) and the interaction of available hardware and family-work conflict (H2c, B=-.16, P<0.05) were significant in predicting job performance. Hypotheses 2b was rejected due to the insignificant interaction effect between available hardware and stress (B=-0.01, P=0.80).

To further analyze differences in the interaction term, we examined the mean differences in Figure 4 and Figure 5. We reviewed the job performance scores at a combination of the mean +/- 1 SD (high and low levels) for family-work conflict. Figure 4 shows that the negative relationship between non-managers and job performance is worsened with inadequate access to hardware, thus supporting hypothesis H1b. Figure 5 shows that the negative relationship between family-work conflict and job performance is worsened with inadequate hardware, in support of hypothesis H3b. Despite the lack of moderating effect of inadequate hardware (H2b is not supported), it is important to note that stress has a significant negative main effect on job performance (B=-0.10, P<0.01). This shows that higher stress leads to negative job performance regardless of hardware availability.

Table 4. Hierarchical Regression Analysis for Hardware Availability Predicting Job Performance

	Model 1		Model 2		Model 3	
	B	**Std. Error**	**B**	**Std. Error**	**B**	**Std. Error**
Gender = Female	-0.03	0.09	0.02	0.07	0.03	0.07
Age	0.15**	0.03	0.06*	0.03	0.06*	0.03
Family Responsibility = No	0.64**	0.11	0.23*	0.09	0.22*	0.09
Family Responsibility = Equal	0.34**	0.11	0.17*	0.09	0.18*	0.09
Role= Not Management			-0.26**	0.08	-0.31**	0.08
Stress			-0.10**	0.03	-0.10**	0.03
Family-work conflict			-0.42**	0.03	-0.43**	0.03
Hardware Availability			-0.19*	0.08	-0.10	0.08
Hardware Availability X Role					-0.43*	0.20
Hardware Availability X Stress					-0.02	0.06
Hardware Availability X Conflict					-0.16*	0.07
R2	0.11		0.45		0.47	
Change in R2	0.11		0.34		0.01	
F Change	13.09**		64.44**		3.71*	

*p < .05. ** p < 01, n= 423

Figure 4. Hardware's Moderation of Job Role's Impact on Performance

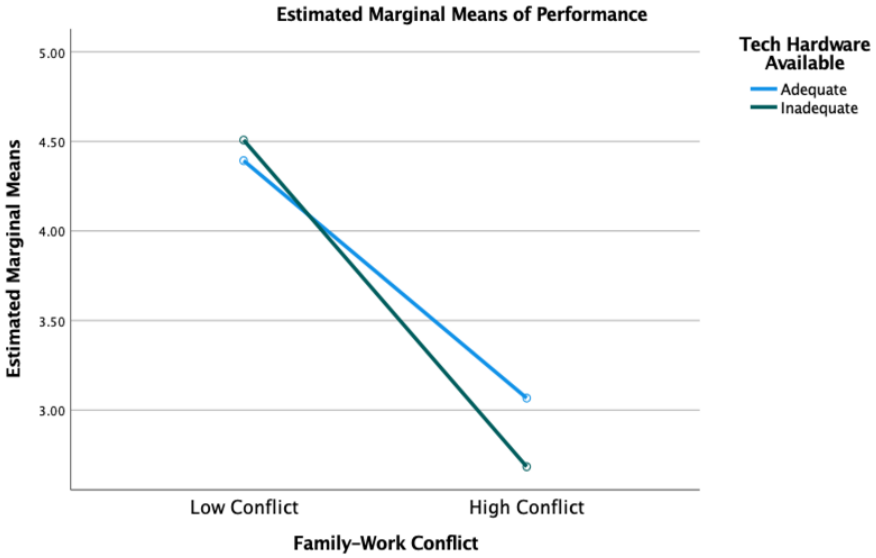

Figure 5. Hardware's Moderation of Family-Work Conflict's Impact on Performance

ICT Moderation Model for Software

Hypotheses 1c, 2c, and 3c examine available software as a moderator between job role, family-work conflict, and performance. As shown in Table 5, the main effects in model 2 for job role (B=-0.26, P<0.01), stress level (B=-0.11, P<0.01), and family-work conflict (B= -0.41, P<0.01) all predicted job performance, as did inadequate software availability (B=-0.24, P<0.01). The change in R2 was significant (change in R2 = 0.34, P<0.01) relative to the variance explained. In the final step, job role interaction with inadequate software (B=-0.36, P=0.07), stress and inadequate software (B=0.02, P=0.67), and family-work conflict and inadequate software (B=-0.06, P=0.43) were not significant in predicting job performance. Thus, hypotheses 1c, 2c and 3c were rejected due to the insignificant interaction effect. Also, the change in R2 for model 3 was insignificant (change in R2 = 0.01, P>0.05). Despite the lack of moderating effect, it is important to note that job role, family-work conflict and stress all have a negative main effect on job performance. This shows that a non-management job role is associated with negative job performance regardless of the software availability. It also shows that higher stress and higher family-work conflict led to lower job performance regardless of software availability.

Table 5. Hierarchical Regression Analysis for Software Availability Predicting Job

	Model 1		Model 2		Model 3	
	B	**Std. Error**	**B**	**Std. Error**	**B**	**Std. Error**
Gender = Female	-0.03	0.09	0.02*	0.07	0.02	0.07
Age	0.14**	0.03	0.06*	0.03	0.06*	0.03
Family Responsibility = No	0.64**	0.11	0.23*	0.09	0.24**	0.09
Family Responsibility = Equal	0.33**	0.11	0.18**	0.09	0.19*	0.09
Role= Not Management			-0.26**	0.08	-0.29**	0.08
Stress			-0.11**	0.03	-0.11**	0.03
Family-work conflict			-0.41**	0.03	-0.41**	0.03
Software Availability			-0.24**	0.08	-0.18*	0.09
Software Availability X Role					-0.36	0.20
Software Availability X Stress					0.03	0.07
Software Availability X Conflict					-0.06	0.08
R2	0.11		0.46		0.46	
Change in R2	0.11		0.34		0.01	
F Change	13.04**		66.06**		1.39	

*p < .05. ** p < 01, n= 423

Figure 6 provides a summary of these results.

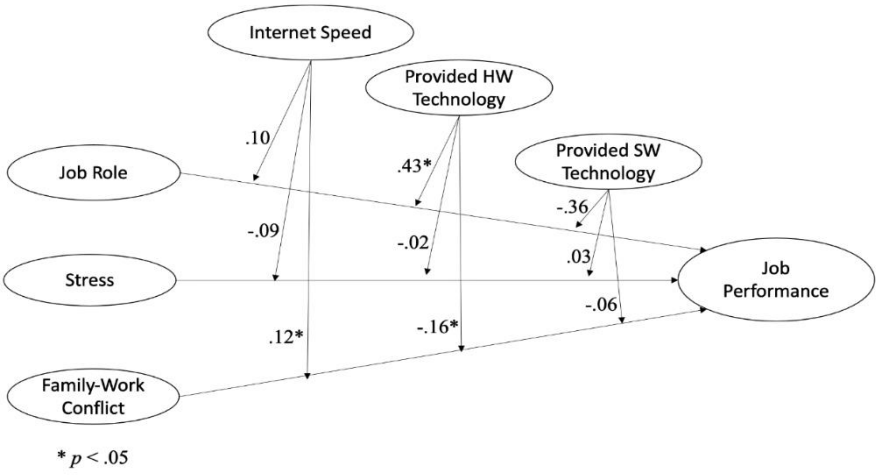

Figure 6. Model Results

6 Discussion

As organizations look to the future, many realize the future of work may look different than what we experienced during pre-pandemic times, with many planning to stay virtual or adopt a hybrid virtual model (Paul, 2020; Alexander et al., 2021; Vyas, 2021). With several unknown factors on the horizon, we help address this future scenario by exploring how ICT influences the effect of remote workers' personal work environments on their job performance.

We first documented how technology usage changed when workers had to WFH during the pandemic. Respondents reported an increase in ICT use, notably teleconferencing technologies and cloud storage. Less common were increases in productivity tools, company applications such as ERP, and security applications such as a VPN. Our results corroborate prior research that shows ICT enhances the feasibility of WFH (Curzi, Pistoresi, and Fabbri, 2020), and ICT availability with a stable Internet connection is necessary for a team to be able to work well remotely (McKeown, 2016). This justifies investigation as to their efficacy in improving worker performance when employees encounter unique challenges or roadblocks due to the colocation of work and home. ICT adoption accelerated during the pandemic and is considered to be the primary enabler of the future of work (Vyas, 2021).

Testing of our research question explored whether ICT could influence the relationship among several personal work environmental factors (i.e., job role, stress, and family-work conflict) and job performance, as these factors are likely to be affected by having to WFH. Three core themes emerged in our analysis. First, all three personal work environment factors - job role, stress, and family-work conflict - have a direct effect on job performance. Second, low Internet speed and hardware availability increase the negative impact of family-work conflict. Finally, two demographic factors, family caregiver responsibility and age, also significantly explain performance differences.

6.1 Job Role

Job role has a direct effect on job performance with provided hardware technology having a moderating effect, while Internet speed and provided software technology did not. Non-managers self-reported lower job performance than managers and this difference increased when they did not have adequate access to hardware. This may mean that managers are more likely to be provided with hardware for home use by the employer, or that they are more inclined to purchase their own hardware and do not need any provided by their employer. In either situation, non-managers are less able to perform given the hardware with which they must accomplish their work.

Although Internet speed and provided software technology did not have a significant effect on job performance differences between the two job roles, they were still important factors. When asked about Internet speed and reliability, managers were more likely to have good, reliable Internet access than non-management respondents.

This raises the question "who is responsible for ensuring that employees, when forced to WFH, have a suitable work environment?" Complications ensue if there are

multiple people WFH, a situation rarely encountered widely in the past. Few organizations have pre-planned ways to support an office environment for every employee who is WFH.

Looking ahead, workers should gain experience using ICT tools on a regular basis, to ensure that they are prepared during future WFH scenarios. In addition to hardware and software, employers should consider the WFH workspace so employees have the proper office equipment (e.g., ergonomics, screen size, monitors) to remain productive Fornara et al., 2022).

6.2 Stress

Employees often struggled with the shift to remote work, with the transition to a digital work environment a particular challenge (Hutzler, 2020; Galanti et al, 2021). These struggles bear out as stress, whether caused by different tasks, changed work processes, the home setting, or learning to use new ICT. Our findings confirm that stress has a direct effect on job performance while WFH. Participants reported higher stress levels than pre-pandemic times, and respondents with higher stress levels during the pandemic reported lower performance. We found no moderating effect from provided hardware technology, provided software technology, or Internet speed, which implies that sources other than technostress (Hung et al., 2011; Tarafdar et al., 2007) are the drivers of WFH stress.

However, it is important to note that Internet speed's impact on job performance was close to significant with a P value of .08. Respondents with fast Internet speed experienced somewhat lower stress than those with acceptable Internet speed or with slow Internet. This is corroborated in a survey reported by Computerworld (Oct. 2020), as unreliable home broadband connectivity was noted as the primary technical challenge businesses faced with remote work during the COVID-19 pandemic.

There was no significant difference in stress levels between those that regularly performed work-related tasks from home prior to the pandemic than those that did not. This suggests that stress levels are not related solely to WFH. In addition, stress levels did not differ markedly between management and non-management levels. While prior research has shown that managers experience more ICT-induced stress than non-managers (Boyer-Davis, 2019; Stadin et al., 2020), this does not consider WFH.

Work-related stressors were magnified by respondents' living arrangements - respondents living alone experienced lower stress than those living with others. This is supported by Dockery and Bawa (2014) who found that remote workers found it challenging to balance work and family responsibilities simultaneously which resulted in higher stress. Studies show that although WFH is positively related to overall job satisfaction because of the increased flexibility of achieving work-related tasks, it leads to more job-induced stress and negative personal well-being due to work overload and work-life conflicts (Anderson, Kaplan, and Vega, 2015; Hayman, 2010; Fornara et al, 2021). Thus, it is not surprising that both stress and family-work conflict were associated with lowered job performance.

6.3 Family-Work Conflict

Perhaps the biggest visible change to the pandemic-time work environment is its colocation. Not only were workers suddenly making do with whatever home office equipment they may own, they also must contend with the many distractions of working alongside family members or roommates, who contend for space, attention, and silence (Fornara et al., 2022). The removal of a boundary between work and home life is a significant source of individual work-related conflict (Eddleston and Mulki, 2017; Greenhaus and Beutell, 1985; van der Lippe and Lippényi, 2018; Voydanoff, 2005). We found a negative relationship between family-work conflict and job performance, meaning job performance decreased with heightened family-work conflict. Further, the effect of family-work conflict is worsened by slow Internet access and deficient employer provision of hardware technology.

WFH during COVID-19 creates a new set of technology challenges that did not exist before. Household members may compete for access to the Internet or the family's hardware (Galanti et al., 2021). This can lead to conflict due to reduced Internet speed if they all need to be on Zoom at the same time or are forced to vie for a single-family computer or printer. Therefore, it is not surprising that insufficient ICT lowered job performance for those experiencing family-work conflict.

Family-work conflict is especially significant for those who might have insufficient time or capacity to effectively manage the trade-off among their work, social and home roles (Choudhury, Koo, and Li, 2020; Galanti et al., 2021). This corroborates the results of our demographic analysis, in which gender had no direct effect on job performance, a relationship that appears to counter intuition and the popular press about how women are under more pressure than men during these times (Alon et al., 2020; Giurge et al., 2021; Lyttelton et al., 2020; Peters, 2021). While the gender of remote workers was not a meaningful predictor of performance, we do note that family or caregiving responsibility is a strong determinant of performance, even when the respondent reports equal responsibility. These responsibilities are likely to be carried by women, and these are also the demographic that the popular press documents as withdrawing from the workforce due to conflicting work-family demands (Alon et al., 2020; Petts et al., 2020).

Even without the distraction of family responsibility, the lack of a boundary between work and home was a notable challenge for many. Employers need to enable boundaries in their WFH strategies and put into place mechanisms for remote workers to control the number and timing of work hours considering personal commitments (Galanti et al., 2021; Pfeffer, 2018).

One other interesting demographic finding was the significance of age as having a positive direct relationship with job performance. Some of this may be attributable to the likelihood that older workers are less likely to have small or school-age children at home. They are also more likely to be managers, and that job role was demonstrated to lead to higher performance. Or it may be that older workers have had more time to garner experience with remote work prior to COVID19, and therefore find the transition less dramatic. There is more to learn here, and we suggest that further research be conducted on how these demographic variables relate to characteristics of the person-

al work environment to provide guidance for companies' ability to support all of their employees who WFH.

The results of this study will be valuable to employers concerned with the welfare of their workers who may prefer to WFH post-pandemic. Companies will need to establish workable WFH policies that fit with the expectations of both employers and employees as we enter the "new normal" world where ICT will be a key enabler (Vyas, 2022).

7 Limitations and Directions for Future Research

Like any study, this one suffers from limitations. We chose to distribute a survey to capture a global snapshot of a dynamic situation that is changing quickly. Due to the need for timely and widespread dissemination of our instrument, we employed a convenience sample and snowball survey distribution. This led to uneven representation globally as the countries where the authors reside are overly represented in the sample. Only an English version was distributed. We are unable to estimate how well the sample represents the actual population of WFH workers, as there is little hard evidence of the true distribution of WFH employees around the world. We also acknowledge that pandemic closures occurred in countries at different times and with different limitations, which might affect how long participants had been working at home before responding and what their personal situation might be. This could also affect their expectations about the future of their WFH experience and the nature of the tasks they are responsible for during this period. In addition, data reflect respondent perceptions of the constructs in the study and were not corroborated by other independent sources or measures.

This study reported on the results of the first of three surveys planned to assess WFH job-related, personal and ICT characteristics of remote workers. Added constructs in the follow-up surveys will ascertain the longer-term effects of forced WFH to contrast with the initial reactions of this sample. To illustrate, we will explore the nature and sources of stress attributable to WFH during the pandemic. Our broader project aims to build upon the Job Demands and Resources model (Demerouti et al., 2001) by adapting it to the WFH setting. The multi-time-period study will allow us to distinguish the short-term and longer-term relationships among a larger number of WFH factors and demographic characteristics. Once the third survey is conducted in summer 2022, we will have a better window into the benefits and challenges of WFH that should help to inform businesses about the assistance needed to ensure performance enhancement in the home environment (Vyas, 2022).

References

1. Agle, B. R., and Caldwell, C. B. (1999). Understanding research on values in business: A level of analysis framework. Business & Society, 38(3), 326-387.
2. Ahrendt, D., Cabrita, J., Clerici, E. et al. (2020). Living, Working and Covid-19. Luxembourg: Publications Office of the European Union, 1-80.

3. Alexander, A., De Smet, A., Langstaff, M., and Ravid, D. (2021). Employees want more certainty about postpandemic working arrangements – even if you don't yet know what to tell them, McKinsey & Company, retrieved from https://www.mckinsey.com/business-functions/people-and-organizational-performance/our-insights/what-employees-are-saying-about-the-future-of-remote-work, retrieved on 03.03.2022.
4. Alon, T., Doepke, M., Olmstead-Rumsey, J., and Tertilt, M. (2020). The impact of COVID-19 on gender equality. National Bureau of economic research.
5. Anderson, A. J., Kaplan, S. A., and Vega, R. P. (2015). The impact of telework on emotional experience: When, and for whom, does telework improve daily affective well-being? European Journal of Work and Organizational Psychology, 24(6), 882-897.
6. Ashforth, B. E., Kreiner, G. E., and Fugate, M. (2000). All in a day's work: Boundaries and micro role transitions. Academy of Management review, 25(3), 472-491.
7. Becker, T. E., Billings, R. S., Eveleth, D. M., and Gilbert, N. L. (1996). Foci and bases of employee commitment: Implications for job performance. Academy of management journal, 39(2), 464-482.
8. Bélanger, F., Collins, R. W., and Cheney, P. H. (2001). Technology requirements and work group communication for telecommuters. Information Systems Research, 12(2), 155-176.
9. Boyer-Davis, S. (2019). The empirical relationship between leadership style and technostress. ASBBS Proceedings, 26, 99-112.
10. Brammer, S., Millington, A., and Rayton, B. (2007). The contribution of corporate social responsibility to organizational commitment. The International Journal of Human Resource Management, 18(10), 1701-1719.
11. Brynjolfsson, E., Horton, J., Ozimek, A., Rock, D., Sharma, G., and Ye, H. Y. T. (2020). Covid-19 and remote work: An early look at us data. Unpublished work. https://john-joseph-horton.com/papers/remote_work.pdf?utm_source=npr_newsletter&utm_medium=email&utm_content=20200427&utm_term=4544910&utm_campaign=money&utm_id=33857746&orgid=310. Retrieved on 01.06.2020.
12. Callister, P. (2003). Overwork, work schedules, working at home and time spent with family members: How time use data can inform work/life policy. Working Paper. URL: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.517.324&rep=rep1&type=pdf.
13. Calvasina, G. E., Calvasina, R. V., and Calvasina, E. J. (2012). The virtual office: HRM legal, policy, and practice issues. Business Studies Journal, 4(2), 37-46.
14. Chesley, N. (2005). Blurring boundaries? Linking technology use, spillover, individual distress, and family satisfaction. Journal of Marriage and Family, 67(5), 1237-1248.
15. Choudhury, P., Koo, W.W., and Li, X. (2020). Working (From Home) During a Crisis: Online Social Contributions by Workers During the Coronavirus Shock. Harvard Business School Working Paper, No. 20-096, March 2020.
16. Chung, H., and van der Lippe, T. (2018). Flexible working, work–life balance, and gender equality: Introduction. Social Indicators Research, 1-17.
17. Collins, C., Landivar, L. C., Ruppanner, L., and Scarborough, W. J. (2020). COVID-19 and the gender gap in work hours. Gender, Work & Organization.
18. Cousins, K. C., and Robey, D. (2005). Human agency in a wireless world: Patterns of technology use in nomadic computing environments. Information and Organization, 15(2), 151-180.
19. Craig, L., and Sawrikar, P. (2009). Work and family: how does the (gender) balance change as children grow?. Gender, Work & Organization, 16(6), 684-709.

20. Criscuolo, C., Gal, P., Leidecker, L., Losma, F. and Nicoletti, G., "The role of telework for productivity during and postCOVID-19: Results from an OECD survey among managers and workers", OECD Productivity Working Papers, 2021-31, OECD Publishing, Paris.
21. Curzi, Y., Pistoresi, B., and Fabbri, T. (2020). Understanding the stressful implications of remote e-working: Evidence from Europe (No. 0165). University of Modena and Reggio Emilia, Department of Economics.
22. Deloitte (2021). Building the Resilient Organization - 2021 Deloitte Global Resilience Report. Deloitte Insights. URL: https://www2.deloitte.com/content/dam/insights/articles/US114083_Global-resilience-and-disruption/2021-Resilience-Report.pdf?icid=learn_more_content_click.
23. Demerouti, E., Bakker, A. B., Nachreiner, F., and Schaufeli, W. B. (2001). The job demandsresources model of burnout. Journal of Applied psychology, 86(3), 499
24. Dockery, A.M., and Bawa, S. (2014). Is working from home good work or bad work? Evidence from Australian employees [online]. Australian Journal of Labour Economics, Vol. 17, No. 2, Aug 2014: 163-190.
25. Eddleston, K. A., and Mulki, J. (2017). Toward understanding remote workers' management of work–family boundaries: The complexity of workplace embeddedness. Group & Organization Management, 42(3), 346-387.
26. Edwards, J. R., and Lambert, L. S. (2007). Methods for integrating moderation and mediation: A general analytical framework using moderated path analysis. Psychological Methods, 12(1), 1–22.
27. Factor, R., Oliver, A. L., and Montgomery, K. (2013). Beliefs about social responsibility at work: comparisons between managers and non-managers over time and cross-nationally. Business Ethics: A European Review, 22(2), 143-158.
28. Fornara, F., Mosca, O., Bosco, A., Caffo, A., Lopez, A., Iachini, T., Ruggiero, G., Ruotolo, F., Sbordone, F.L., Ferrara, A., Cattaneo, Z., Ariolo, M., Frassinetti, F., Candini, M., Miola, L. and Pazzaglia, F. (2022). Space at Home and Psychological Distress During the Covid-19 Lockdown in Italy, Journal of Environmental Psychology, 79(101747), 1-10.
29. Galanti, T., Guidetti, G., Mazzei, E., Zappala, S. and Toscano, F. (2021). Work From Home During the COVID-19 Outbreak: The Impact on Employees' Remote Work Productivity, Engagement, and Stress. Journal of Occupational and Environmental Medicine, 63(7), e426-e432.
30. Gerlach, J. P. (2018). Work, Home, and Technology: Towards a Framework of IT-Based Boundary Management. 26th European Conference on Information Systems (ECIS 2018).
31. Giurge, L. M., Whillans, A. V., and Yemiscigil, A. (2021). A multicountry perspective on gender differences in time use during COVID-19. PNAS Proceedings of the National Academy of Sciences of the United States of America, 118(12), Article e2018494118.
32. Golden, A. G. and Geisler, C. (2007). Work–life boundary management and the personal digital assistant. Human Relations, 60(3), 519–551.
33. Golden, T. D. (2009). Applying technology to work: Toward a better understanding of telework. Organization Management Journal, 6(4), 241-250.
34. Gopinath, G. (2020). The Great Lockdown: Worst Economic Downturn Since the Great Depression. IMF Blog, April, 14. https://blogs.imf.org/2020/04/14/the-great-lockdown-worst-economic-downturn-since-the-great-depression/. Retrieved on 01.06.2020.
35. Greenhaus, J.H., and Beutell, N.J. 1985. Sources of conflict between work and family roles. Academy of Management Review, 10(1), 76-88.
36. Hayman, J. (2010). Flexible work schedules and employee well-being. New Zealand Journal of Employment Relations, 35(2), 76.

37. House, R. J., and Rizzo, J. R. (1972). Role conflict and ambiguity as critical variables in a model of organizational behavior. Organizational behavior and human performance, 7(3), 467-505.
38. Hung, W. H., Chang, L. M., and Lin, C. H. (2011). Managing the Risk of Overusing Mobile Phones in the Working Environment: A Study of Ubiquitous Technostress. In PACIS (p. 81).
39. Hutzler, A. (2020). More Than 7 in 10 Employers Are Struggling to Adapt to Remote Work, Survey Shows. News Week. https://www.newsweek.com/more-7-10-employers-are-struggling-adapt-remote-work-survey-shows-1499236?utm_source=npr_newsletter&utm_medium=email&utm_content=20200427&utm_term=4544910&utm_campaign=money&utm_id=33857746&orgid=310. Retrieved on 06.01.2020.
40. Jamal, M. (1985). Type A behavior and job performance: Some suggestive findings. Journal of Human Stress, 11(2), 60-68.
41. Kamal, M. M. (2020). The triple-edged sword of COVID-19: understanding the use of digital technologies and the impact of productive, disruptive, and destructive nature of the pandemic. Information Systems Management, 37(4), 310-317.
42. Karanikas, N., and Cauchi, J. (2020). Literature review on parameters related to Work-From-Home (WFH) arrangements.
43. Keyes, C. L. (2002). The mental health continuum: From languishing to flourishing in life. Journal of health and social behavior, 207-222.
44. Kreiner, G. E. (2006). Consequences of work-home segmentation or integration: A person-environment fit perspective. Journal of Organizational Behavior, 27(4), 485–507.
45. Lounsbury, J. W., Sundstrom, E. D., Gibson, L. W., Loveland, J. M., and Drost, A. W. (2016). Core personality traits of managers. Journal of Managerial Psychology, Vol. 31. Iss 2.
46. Lyttelton, T., Zang, E., and Musick, K. (2020). Gender differences in telecommuting and implications for inequality at home and work. Available at SSRN 3645561.
47. McKeown, S. (2016). Dealing with the causes of stress in remote teams. Human Made. URL:https://humanmade.com/uploads/sites/3/2016/11/dealing_with_the_causes_of_stress_in_remote_teams.pdf.
48. Meinert, D. (2011). Make telecommuting pay Off. HRMagazine, Vol. 56 # 6, pp, 33-37.
49. Moss, J. (2021). The Burnout Epidemic: The Rise of Chronic Stress and How We Can Fix It. Boston: Harvard Business Review Press, 1-269.
50. Morikawa, M. (2022) Work-from-home Productivity During the COVID-19 Pandemic: Evidence from Japan. Economic Inquiry. 60, 508-527.
51. Netemeyer, R.G., Boles, J.S., and McMurrian, R. (1996). Development and validation of work–family conflict and family–work conflict scales. Journal of Applied Psychology, 81(4), p.400.
52. Nickson, D., and Siddons, S. (2004). Remote Working: Linking People and Organizations. Industrial and Commercial Training 36(2).
53. Nilles, J. M., Carlson, F. R., Gray, P., and Hanneman, G. (1974). Telecommunications-transportation tradeoffs. Final Report. 1 Jul. 1973-31 Dec. 1974 University of Southern California, Los Angeles.
54. Nunnally, J. C. (1978). An overview of psychological measurement. Clinical diagnosis of mental disorders, 97-146.
55. Pan, S. L., Cui, M., and Qian, J. (2020). Information resource orchestration during the COVID-19 pandemic: A study of community lockdowns in China. International Journal of Information Management, Volume 54, 2020, 102143, ISSN 0268-4012.

56. Paul, K. (2020). Twitter announces employees will be allowed to work from home 'forever'. The Guardian. Retrieved from: https://www.theguardian.com/technology/2020/may/12/twitter-coronavirus-covid19-work-from-home.
57. Peter, K. A., Schols, J. M., Halfens, R. J., and Hahn, S. (2020). Investigating work-related stress among health professionals at different hierarchical levels: A cross-sectional study. Nursing Open, 7(4), 969-979.
58. Peters, E. (2021). What You Want Is Not Always What You Get: Gender Differences in Employer-Employee Exchange Relationships during the COVID-19 Pandemic. Social Sciences, 10(8), 281.
59. Petts, R. J., Carlson, D. L., and Pepin, J. R. (2020). A Gendered Pandemic: Childcare, Homeschooling, and Parents' Employment During COVID-19. Gender, Work & Organization.
60. Pfeffer, J. (2018) Dying for a Paycheck. New York: Harper Business, 1-258.
61. Prezza, M., Pacilli, M. G., and Dinelli, S. (2004). Loneliness and new technologies in a group of Roman adolescents. Computers in human behavior, 20(5), 691-709.
62. PWC (2020). PwC's COVID-19 CFO Pulse Survey US findings — May 11, 2020. Retrieved from: https://www.pwc.com/us/en/library/covid-19/pwc-covid-19-cfo-pulse-survey.html?utm_source=npr_newsletter&utm_medium=email&utm_content=20200427&utm_term=4544910&utm_campaign=money&utm_id=33857746&orgid=310.
63. Rahim, N. I. M., Rahman, A. A., and Iahad, N. A. (2018). The Overview for Implementing Work from Home (WFH) in Malaysia Higher Education Institution (HEI) Context. International Journal of Innovative Computing, 8(3).
64. Rhodes, S. R. (1983). Age-related differences in work attitudes and behavior: A review and conceptual analysis. Psychological Bulletin, 93, 328 –367.
65. Salgado, J. F. (1997). The Five Factor Model of personality and job performance in the European Community. Journal of Applied psychology, 82(1), 30.
66. Sarker, S., Sarker, S., Xiao, X., and Ahuja, M. (2012). Managing employees' use of mobile technologies to minimize work-life balance impacts.
67. Scandura, T. A., and Lankau, M. J. (1997). Relationships of gender, family responsibility and flexible work hours to organizational commitment and job satisfaction. Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior, 18(4), 377-391.
68. Skakon, J., Kristensen, T. S., Christensen, K. B., Lund, T., and Labriola, M. (2011). Do managers experience more stress than employees? Results from the Intervention Project on Absence and Well-being (IPAW) study among Danish managers and their employees. Work, 38(2), 103-109.
69. Stadin, M., Nordin, M., Broström, A., Hanson, L. L. M., Westerlund, H., and Fransson, E. I. (2021). Technostress operationalised as information and communication technology (ICT) demands among managers and other occupational groups–results from the Swedish longitudinal occupational survey of health (SLOSH). Computers in human behavior, 114, 106486.
70. Tarafdar, M., Tu, Q., Ragu-Nathan, B. S., and Ragu-Nathan, T. S. (2007). The impact of technostress on role stress and productivity. Journal of management information systems, 24(1), 301-328.
71. Tett, R. P., Guterman, H. A., Bleier, A., and Murphy, P. J. (2000). Development and content validation of a "hyperdimensional" taxonomy of managerial competence. Human performance, 13(3), 205-251.

72. The Economist (2020). Covid-19: is working from home really the new normal? The Economist. Retrieved from: https://www.youtube.com/watch?v=MxDVucUZCnc&feature=youtu.be.
73. van der Lippe, T., and Lippényi, Z. (2018). Beyond formal access: Organizational context, working from home, and work–family conflict of men and women in European workplaces. Social Indicators Research, 1-20.
74. van der Lippe, T., and Lippényi, Z. (2020). Co-workers working from home and individual and team performance. New Technology, Work and Employment, 35(1), 60-79.
75. Voydanoff, P. (2005). Toward a conceptualization of perceived work-family fit and balance: A demands and resources approach. Journal of marriage and family, 67(4), 822-836.
76. Vyas, L. (2022). "New Normal" at Work in a Post-COVID World: Work-life Balance and Labor Markets. Policy and Society, 41(1), 155-167.