

The role of psychosocial safety climate on flexible work from home digital job demands and work-life conflict

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Abstract: Due to the COVID-19 pandemic, the number of employees in flexible work from home has increased markedly along with a reliance on information communication technologies. This study investigated the role of an organisational factor, psychosocial safety climate (PSC; the climate for worker psychological health and safety), as an antecedent of these new kinds of demands (specifically work from home digital job demands) and their effect on work-life conflict. Data were gathered via an online survey of 2,177 employees from 37 Australian universities. Multilevel modelling showed that university level PSC to demands, $y=-0.09$, $SE=0.03$, $p<0.01$, and demands to work-life conflict, $y=0.51$, $SE=0.19$, $p<0.05$, relationships were significant. Supporting the antecedent theory, university level PSC was significantly indirectly related to work-life conflict via demands (LL -0.10 UL -0.01). Against expectations PSC did not moderate the demand to work-life conflict relationship. The results imply that targeting PSC could help prevent work from home digital job demands, and therefore, work-life conflict. Further research is needed on the role of digital job resources as flexible and hybrid work takes hold post COVID.

Key words: Digital job demands, Information communication technologies, Hybrid work, Flexible work, Psychosocial safety climate, Work-life conflict

Introduction

The COVID-19 pandemic has increased flexible work from home practices and the ensuing reliance on information communication technologies (ICTs). The percentage of Australians working at least one day from home has risen from 24% prior to the pandemic in March 2020 to

41% in February 2021 and to 44% by February 2022¹. This change has led some commentators to speculate that working from home may now be the new normal for future work arrangements². The ability to work from home has been enabled by ICTs such as email, videoconferencing, file-sharing platforms and instant messaging³. Despite the increase of flexible work-related ICTs at home, the development and impact of harmful digital job demands associated with these new communication technologies on non-work time are not clearly understood. Independently, both working from home and ICTs have been associated

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with greater work-life conflict^{4, 5)} which, in turn, has been associated with a range of deficits, including emotional exhaustion, poor work engagement, sickness absence, poor physical and mental health, and poor sleep quality^{6–9)}.

To mitigate the health and safety challenges arising from digital job demands, organisations such as the Australian university sector, have developed policies to govern ICT practices (see Potter *et al.*¹⁰⁾). What is less clear is the effectiveness of such policies. Interview findings involving senior Australian university Human Resource managers and a review of policy documents have indicated gaps regarding responsivity expectations, adequacy of ICT training, and establishing positive working practices¹¹⁾. This literature remains to be expanded, in particular, to what extent do employees perceive the psychological health and safety climate within their organisation with regard to ICT practices and digital job demands when working from home. Employees' perception of the policies, practices, and procedures in place to protect their psychological health and safety is known as psychosocial safety climate (PSC)¹²⁾. PSC is thought to be an upstream organisational resource that shapes organisational culture and acts as a precursor to the job demands and job resources (JD-R)—the imbalance of which is reported to underlie occupational stress¹³⁾. In the university sector, for example, a higher frequency of working from home has been associated with higher levels of stress in academics in some¹⁴⁾ but not all studies¹⁵⁾. Moreover, job demands are reported to be high and associated with greater work-life conflict in academics in Australia and the United Kingdom¹⁶⁾. It is likely that this situation has worsened since the advent of the COVID-19 pandemic and the new demands of remote learning.

As yet, the JD-R theoretical framework incorporating PSC has not examined ICT practices, specifically digital job demands, when working from home. Moreover, putative relationships between PSC, digital job demands, and their impact on work-life conflict have yet to be examined. The present study aims to address these gaps.

Working from home

Working from home during the COVID-19 pandemic is purported to have benefits and/or challenges for employees. Benefits include the ability to work flexible hours, have greater autonomy, decreased time pressure (due to less time spent commuting and workplace interruptions), better general physical health and lower levels of absenteeism^{6, 17–19)}. However, there are also challenges associated with working from home, including increased

workloads, lacking adequate tools and space, social isolation, interruptions from others in the home and increased emotional exhaustion at the end of the working day^{18–20)}. Some studies have also found that flexible working hours can lead to poor work-life balance^{4, 21)}. Those employees who exercised a concerted effort to keep work and home domains separate, and those with a dedicated home office, have experienced greater work-life balance²²⁾. In the work from home literature, research has also found a gender role issue as there is an unequal and negative impact on those identifying as female versus those identifying as male^{23–26)}. For example, women with children and caring responsibilities experience additional pressure and stress; with children and home life being prioritised during the day so work is often completed late at night^{23–26)}.

Some studies on working from home briefly mention digital job demands, however, it is not frequently the focus of the study. Pennington *et al.*²⁵⁾ found that during the pandemic the use of video communication and text messages resulted in increased stress due to increased cognitive loads and expectations of quick responses. Additionally, the use of technology was found to moderate the relationship between challenge stressors (i.e. job demands that can be rewarding and offer growth, for example time pressure and job responsibilities) and work-life conflict, with high challenge stressors and high technology use resulting in greater work-life conflict²⁷⁾. In sum, there is limited research on the digital job demands of working from home which limits the understanding of how and why high levels of digital job demands impact the personal lives of employees and can lead to work-life conflict.

Work from home digital job demands

Previous studies on workplace ICTs have focused on email. However, it is important to consider the whole technological context as a range of information communication online technologies are now widely used in the workplace, including Microsoft Teams, Zoom, Slack and a proliferation of other platforms¹⁰⁾. Whilst ICTs allow for quick communication, international collaborations, accessibility, and flexibility^{28–31)}, it can be perceived as unfavourable when digital messages are received in high volumes^{29, 32, 33)}. ICTs can also lead to fatigue, miscommunication, distraction from other work, and have physical impacts due to the sedentary nature of this type of work^{28, 30, 34)} and as ICTs create 24/7 connectivity to work, this can lead to an expectation that workers are always available^{28, 32, 33)}. Allmer³⁵⁾ indicates that university managements' values and structures have led to precarious jobs which can lead

employees to feel that they need to work overtime, often using information communication platforms after hours. Therefore, defining aspects of workplace digitalisation that are demanding and detrimental to employees is essential to quantify and mitigate its negative impacts.

There is growing interest in whether work-related information communication is a job demand or a job resource¹⁰. JD-R theory distinguishes job demands and job resources, as job demands encompass those aspects of the job that need to be done and require psychological or physical effort, whereas job resources are aspects of the job that help employees complete their work, manage job demands and can be intrinsically and extrinsically motivating¹³. Previous research suggests that information communication may both be a job demand and a job resource^{36–38}. It is seen as a job demand when it becomes overwhelming, increases supervisor monitoring, increases accessibility and workload, and creates prolonged exposure to work while at home. On the other hand, it is seen as a resource when it allows for greater autonomy and flexibility, has provisions for feedback and decreases workload^{36–38}.

Previous research acknowledges that information communication is a double-edged sword with job resources such as flexibility, collaboration and connectivity becoming job demands when the contextual work environment does not support employees' psychological health as it creates information overload and digital pressure^{10, 37, 38}. It is expected that information communication practices and platforms to work effectively from home will become a demand when there are insufficient opportunities for digital training, time to learn new information communication technologies or there is limited technology infrastructure for its implementation which can lead to work-life conflict.

PSC and work from home digital job demands

PSC consists of four dimensions: management commitment, management priority, organisational participation, and organisational communication¹². Management commitment refers to senior management supporting and providing timely resources for stress prevention. Management priority refers to senior management giving priority to employee wellbeing in comparison to productivity. Organisational participation refers to all employees and stakeholders being involved in the creation of stress prevention interventions in the workplace. Finally, organisational communication relates to the level of management communication about stress prevention and employee consultation to be able to discuss concerns¹².

PSC extends the JD-R model as it is a higher-level predictor of job demands and resources^{12, 39}. The JD-R model theorises two pathways leading to employee outcomes. The first is the health erosion pathway in which job demands lead to poor health outcomes and exhaustion, as employees' mental and physical resources are eroded⁴⁰. The second pathway, the motivational pathway, suggests that job resources lead to employees' work engagement as resources promote intrinsic and extrinsic motivation for them to learn, develop and achieve goals in the workplace and create meaning to their work⁴⁰. Numerous studies have provided empirical evidence for the JD-R model in various industries and countries including The Netherlands, Australia and China^{13, 41}.

Higher levels of PSC are related to higher job resources, such as supervisor support and job control, and lower job demands, such as workload and cognitive demands^{39, 42}. While working from home it is expected that management will have developed norms for information communication use, and will have provided training and technical equipment.

As the organisational climate drives job demands and resources¹², it is likely that digital job demands will be lower in organisations where employees perceive management taking care of employee health and psychological safety. Therefore, in this study PSC is considered as potential antecedent of working from home digital job demands, where work environments with high PSC have policies, practices and procedures to protect employees' psychological health which leads to reduced working from home digital job demands.

Hypothesis 1a: PSC at the organisational level will be negatively related to working from home digital job demands at an individual (employees') level.

Work from home digital job demands and work-life conflict

Work-life balance is defined as a balance of role engagement between work and nonwork life domains (for example family, domestic responsibilities, personal interests, friends and religion), and is known as work/nonwork balance⁴³. When the work role interferes with nonwork roles it is known as work-life conflict^{44–46}. In this study, the concepts of work-home conflict, when work interferes with the home and/or family role⁴⁷, and work-self conflict, the intrusion of work into time for personal interests^{48, 49} will be considered.

The Work-Home Resources Model (W-HR)⁵⁰ can be used to explain how and why work from home digital job demands may relate to work-life conflict. The W-HR

model explains that work demands can drain personal resources and lead to poorer home outcomes with the result conceptualised as work-home conflict (an aspect of work-life conflict).

Many studies have shown that job demands in general lead to work-family conflict (known as work-home conflict in the present study), as it facilitates inter-role conflict⁵¹). Vaziri *et al.*⁵²) found that employees who experienced greater technostress, i.e. feelings of work overload and blurring of boundaries due to technology use, while working from home, experienced increased work-family conflict. Additionally, Bordi *et al.*³⁶) found that having to adapt to new communication tools and associated technical problems are two aspects of ICTs that are associated with workplace wellbeing, as employees had to resolve technical issues and learn new platforms which added to workload and took valuable work time. These studies highlight that digital job demands, such as new communication platforms and technical issues, can increase job demands, drain resources and lead to work-life conflict (a combination of work-home conflict and work-self conflict).

Therefore, it is hypothesised that:

Hypothesis 1b: The digital job demands of working from home will be positively related to work-life conflict.

PSC, work from home digital job demands and work-life conflict

Previous studies have shown that PSC negatively relates to work-family conflict^{53, 54}). These studies also identify that this relationship is explained through the mediating roles of family support supervisor behaviour and psychological need thwarting^{53, 54}). Currently, there is little research on the relationship between PSC and the broader concept of work-life conflict as previous research has solely focused on work-family conflict. While similar findings are expected, further research is needed to confirm this relationship when also considering conflict with personal time. Additionally, a greater understanding is needed of mechanisms that may explain why a potential relationship between PSC and work-life conflict occurs.

Taking into consideration the arguments above that PSC is related to digital job demands, and these demands are related to work-life conflict, it is expected that the reason PSC could be related to work-life conflict is through the digital job demands of working from home. Therefore, it is expected that PSC relates negatively to work-life conflict through working from home digital job demands, because when management considers employees' psychologi-

cal health, important measures would be put in place to prevent work overload through home digital job demands thereby preventing work-life interference.

We propose a mediated path: *Hypothesis 1c:* PSC is indirectly negatively related to work-life conflict through its negative relationship with working from home digital job demands.

Furthermore, PSC theory also indicates that PSC can moderate the relationships between job demands and job resources to employee work and health outcomes, because it can supply systems of resources that can reduce demands, or it can create a safety signal indicating that it is safe to use resources^{12, 39, 42}). PSC has also been shown to moderate the relationship between emotional demands and distress, emotional exhaustion and somatic symptoms^{55, 56}), job demands and depression⁵⁷), and job demands to fatigue and engagement⁵⁸). Furthermore, a family friendly work culture has been shown to moderate the relationship between the application of flexible work arrangements and work-life conflict⁵⁹). Therefore, it is expected that other forms of workplace culture and climate, like PSC, will moderate the hypothesised relationships.

Hypothesis 2: PSC will moderate the positive relationship between working from home digital job demands and work-life conflict. At high levels of PSC, the strength of the relationship will be reduced.

Subjects and Methods

Participants and procedure

On the 25 January 2020, the first confirmed Australian case of COVID-19 was announced⁶⁰). By mid-March Australians were required to work from home where possible. Data collection for this study occurred from June to November 2020, with participants completing an online survey. This survey was distributed by university management, unions and online advertising campaigns. Study participants were informed of the study content and participation was voluntary. The study was approved by the University of South Australia's Human Research Ethics Committee.

Participants were 2,191 university employees from 39 Australian universities. However, staff from two universities were removed (n=14) due to the small sample size for group-level analyses. The final sample of 2,177 participants includes both academic (n=1,166), professional/non-academic staff (n=1,010) and one participant who did not specify their role. This sample is broadly representative of the Australian higher education population (n=112,

704) with a slightly smaller percentage of professional/non-academic staff (53.71% vs. 57.54%) compared to the university population⁶¹⁾.

Measures

PSC

PSC was measured using the 12-item scale by Hall *et al.*⁶²⁾. The measure consists of four sub-scales: management commitment, management priority, organisational communication and organisational participation. Each item was rated on a five-point scale from ‘*strongly disagree*’ (1) to ‘*strongly agree*’ (5). An example of an item is “Management acts decisively when a concern of an employees’ psychological status is raised”. The Cronbach’s alpha for this scale in the current questionnaire is 0.96.

Working from home digital job demands

Working from home (WFH) digital job demands were measured using three original items, focusing on information communication use while working from home. Items related to training for digital platforms, time to learn platforms and technology infrastructure. The questions were prefaced with a statement that they had been developed to address the impact of COVID-19. The items were rated on a five-point scale from ‘*strongly disagree*’ (1) to ‘*strongly agree*’ (5). The items are “There is insufficient training in digital communication practices/platforms to work effectively from home”, “There is not enough time to learn digital communication practices/platforms to work effectively from home”, and “I do not receive enough technology infrastructure to support my work practices at home”. Cronbach’s alpha in this questionnaire is 0.84.

Work-life conflict

Work-life conflict comprised work-home conflict and work-self conflict items. These were totalled to create work-life conflict as a factor analysis indicated these items loaded onto the same factor (Table 1). Work-home conflict was measured using three items modified from the Netemeyer *et al.*⁶³⁾ work-family conflict scale. An example item is “The demands of my work interfere with my home life”. Each item was rated on a seven-point scale from ‘*strongly disagree*’ (1) to ‘*strongly agree*’ (7). Work-self conflict was measured using the four-item scale by Demerouti⁶⁴⁾. An example item is “You find it difficult to fulfil your personal interests because you are constantly thinking about your work”. Items were rated on a four-point scale from ‘*never*’ (1) to ‘*always*’ (4). All seven items were totalled with a Cronbach’s alpha of 0.91.

Control variables

In this study gender was controlled for as the literature suggests there are gender differences on working from home experiences and work-life conflict^{24, 26, 65)} (1=male; 2=female; 3=non-binary; 4=prefer not to say). Additionally, job role was controlled for as previous studies have found differences in ICT use between academic and professional/non-academic employees³²⁾ (1=academic staff member; 2=professional/non-academic staff member). Finally, the percentage of time spent working from home in the last two months was also controlled.

Data analysis

Initially, SPSS v25 was used to check normality and run preliminary analyses including an exploratory factor analysis, an ANOVA to assess the suitability of gender as a control variable, and correlations. SPSS was used to create an aggregated datafile with the individual scores being grouped by university.

Since PSC is an organisational level construct, and since data were nested within universities, multilevel analyses were conducted using the HLM8 program to test the hypothesised relationships.

To test the hypotheses, variables were added in a series of models. When testing the relationship between PSC and WFH, PSC was entered in Model 1, followed by adding the control variables in Model 2. To test the relationship between WFH and work-life conflict, WFH digital job demands was added in Model 1, Model 2 added PSC in addition to WFH digital job demands. In Model 3 an interaction between PSC and WFH digital job demands was added to test the proposed moderation, finally Model 4 included PSC, WFH digital job demands and the control variables. These pathways were tested at the individual (Level 1) and group level (Level 2).

The Monte Carlo method⁶⁶⁾ for testing indirect effects was used to investigate the proposed mediation pathway of PSC to work-life conflict via WFH digital job demands. The Monte Carlo analysis used 95% confidence intervals and 20,000 repetitions.

Results

Preliminary analyses

An exploratory factor analysis was conducted using principal axis factoring with orthogonal rotation (varimax with Kaiser normalization) to ensure PSC, WFH digital job demands, work-home conflict and work-self conflict were distinct factors. The Kaiser-Meyer-Olkin measure

Table 1. Items and factor loadings of the study variables (N=1,996)

Item	Factor		
	1	2	3
Psychosocial safety climate ^a			
1 In my workplace senior management acts quickly to correct problems/issues that affect employees' psychological health.	0.83		
2 Senior management acts decisively when a concern of an employees' psychological status is raised.	0.81		
3 Senior management show support for stress prevention through involvement and commitment.	0.85		
4 Psychological well-being of staff is a priority for this organisation.	0.87		
5 Senior management clearly considers the psychological health of employees to be of great importance.	0.88		
6 Senior management considers employee psychological health to be as important as productivity.	0.82		
7 There is good communication here about psychological safety issues which affect me.	0.82		
8 Information about workplace psychological well-being is always brought to my attention by my manager/supervisor.	0.62		
9 My contributions to resolving occupational health and safety concerns in the organisation are listened to.	0.67		
10 Participation and consultation in psychological health and safety occurs with employees, unions and health and safety representatives in my workplace.	0.67		
11 Employees are encouraged to become involved in psychological safety and health matters.	0.69		
12 In my organisation, the prevention of stress involves all levels of the organisation.	0.72		
Working from home digital job demands			
13 There is insufficient training in digital communication practices/platforms to work effectively from home.			0.81
14 There is not enough time to learn digital communication practices/platforms to work effectively from home.			0.78
15 I do not receive enough technology infrastructure to support my work practices at home.			0.68
Work-life conflict ^b			
16 You find it difficult to fulfil your personal interests because you are constantly thinking about your work.		0.78	
17 You do not fully enjoy your personal interests because you worry about your work.		0.76	
18 Your work schedule makes it difficult for you to fulfil your personal interests.		0.75	
19 You think about all the things that you still have to do for your work, while you are busy with your personal interests.		0.74	
20 The demands of my work interfere with my home life.		0.83	
21 The amount of time my job takes up makes it difficult to fulfill home responsibilities.		0.83	
22 My job produces strain that makes it difficult to fulfill home duties.		0.82	

Factor loadings >0.30 are shown⁶⁷⁾.

^a Copyright © 2010 by American Psychological Association. Reproduced with permission. Hall GB, Dollard MF, Coward J (2010) Psychosocial safety climate: Development of the PSC-12. *International Journal of Stress Management* **17**, 353–83.

^b Copyright © 1996 by American Psychological Association. Reproduced with permission. Netemeyer RG, Boles JS, McMurrian R (1996) Development and validation of work–family conflict and family–work conflict scales. *Journal of Applied Psychology* **81**, 400–10.

confirmed the sample size was adequate, KMO=0.95 which is considered high⁶⁷⁾ and Bartlett's test of sphericity was significant $\chi^2(231)=37990.98$, $p<0.001$. All 22 items were included, and factors were retained with an eigenvalue greater than one. Three factors were identified, explaining 69.96% of the variance (Table 1).

The first factor (Eigenvalue=10.17) explained 46.24% of the variance and was identified as 12 items measuring PSC. The second factor (Eigenvalue=3.51) explained an additional 15.93% of the variance. The seven items were conceptualised as work-life conflict. This factor combined work-home conflict and work-self conflict. The third factor (Eigenvalue=1.71) explained a further 7.79% of the variance and contained three items relating to WFH digital job demands. As a result, work-self conflict and work-home conflict were combined to create a single factor, called

work-life conflict which was used in further analyses. The results confirm that the WFH digital job demands scale may be distinguished from the PSC and work-life conflict scales.

Gender was considered as a control variable. However, an ANOVA indicated that males ($M=8.73$, $SD=2.95$), females ($M=8.41$, $SD=2.94$) and non-binary ($M=8.75$, $SD=3.60$) participants did not significantly differ on WFH digital job demands $F(2, 1994)=2.42$, $p>0.05$. Similarly, males ($M=21.81$, $SD=7.73$), females ($M=21.78$, $SD=7.70$) and non-binary ($M=23.00$, $SD=10.04$) participants did not significantly differ on work-life conflict $F(2, 1994)=0.25$, $p>0.05$. As the results were not significant, gender was not included in further analyses.

To ensure sufficient organisational variance for multi-level testing, intraclass correlation coefficients, (ICC (1))

were calculated (Table 2). It was confirmed that PSC was appropriate to aggregate at the university level with an ICC of 0.06. This is above the recommended score of 0.05, indicating a small to medium effect⁶⁸). The ICC scores for WFH digital job demands (0.03) and work-life conflict (0.01) were under 0.05. However, LeBreton and Senter⁶⁸) indicate that an ICC of 0.01 can be considered as a small effect size. Additionally, the intercept variance in both null models (Tables 3 and 4) were significant, indicating there is Level 2 variance that can be accounted for with additional predictors and multilevel modelling is appropriate^{69, 70}). The means, standard deviations and correlations are also presented in Table 2. Prior to hypothesis testing,

a scatterplot of the Level 2 PSC and WFH digital job demands was visually inspected and high studentized deleted residual values were reviewed to determine two outliers as recommended by Aguinis *et al.*⁷¹) (Fig. 1).

Hypothesis testing

Hypothesis 1a proposed that PSC aggregated at the university level would be significantly related to WFH digital job demands. Against expectations, it was not significant when controlling for role and time spent working from home, $y=-0.06, SE=0.03, p>0.05$. At this point a scatterplot of the relationship was reviewed (Fig. 1) and given the small numbers at Level 2, outliers could create bias

Table 2. Means, standard deviations, ICC(1) and correlations between PSC, work from home digital job demands and work-life conflict

Variables	M	SD	ICC(1)	1	2	3	4	5
1. Role ^a	1.46	0.50	0.02	1	-0.17	0.22	-0.26	-0.42*
2. Time working from home	81.01	31.3	0.17	-0.21***	1	0.28	0.42**	0.31
3. PSC	33.68	10.94	0.06	0.23***	-0.03	1	-0.25	-0.39*
4. Work from home digital job demands	8.52	2.95	0.03	-0.23***	0.01	-0.37***	1	0.62***
5. Work-life conflict	21.83	7.73	0.01	-0.40***	0.09***	-0.42***	0.39***	1

* $p<0.05$; ** $p<0.01$; *** $p<0.001$.

^aAcademic staff member=1, Professional staff member=2.

Correlations above the diagonal are at the group level, and those below the diagonal are at the individual level. ICC(1) was calculated using full maximum likelihood. $N=1,880-2,176$ participants, $n=37$ universities. PSC: psychosocial safety climate; M: mean; SD: standard deviation; ICC: intraclass correlation coefficient.

Table 3. Hierarchical Linear Modelling for working from home digital job demands

Variables	Working from home digital job demands					
	Null		Model 1		Model 2	
	y (SE)	df	y (SE)	df	y (SE)	df
Intercept (y_{00})	8.67 (0.12)***	34	8.69 (0.11)***	33	10.11 (0.28)***	33
Level 2						
Psychosocial safety climate			-0.09 (0.03)**	33	-0.09 (0.03)**	33
Level 1						
Psychosocial safety climate			-0.10 (0.01)***	1,975	-0.10 (0.01)***	1,803
Role					-1.00 (0.19)***	1,803
Time working from home					-0.01 (<0.01)***	1,803
Additional information						
Within-team (L1) variance (r)	8.39		7.16		6.93	
Intercept (L2) variance (u_0)	0.29***		0.24***		0.21***	
2 Log-likelihood (FIML)	10,553.85		9,696.9		8,818.04	
Number of estimated parameters	3		5		7	
Within-unit pseudo R^2			0.15		0.17	
Between-unit pseudo R^2			0.17		0.28	

* $p<0.05$; ** $p<0.01$; *** $p<0.001$.

$N=1,841-2,119$ participants, $n=35$ universities. Parameter estimates for hierarchical linear modelling are slope coefficients (y) with robust standard errors in parentheses. All Level 1 estimates were group mean-centred except for role which was uncentred. The Level 2 variable was grand mean-centred. SE: standard error; L1: individual level; L2: group level; FIML: full information maximum likelihood.

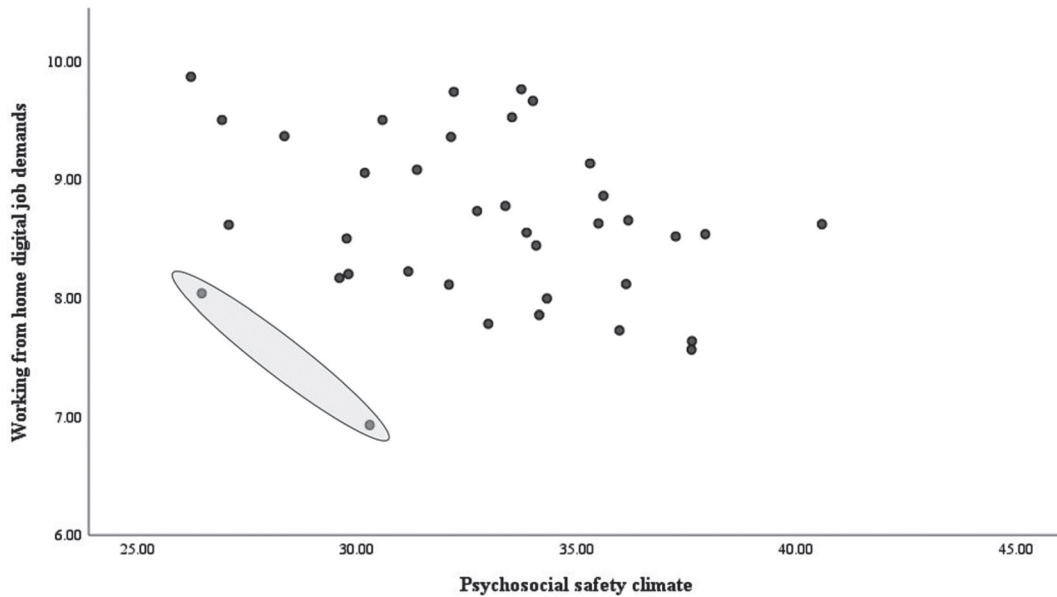


Fig. 1. Scatterplot of Level 2 psychosocial safety climate and working from home digital job demands. The shaded area indicates the outliers identified.

Table 4. Hierarchical Linear Modelling for work–life conflict

Variables	Work–life conflict									
	Null		Model 1		Model 2		Model 3		Model 4	
	<i>y</i> (<i>SE</i>)	<i>df</i>	<i>y</i> (<i>SE</i>)	<i>df</i>	<i>y</i> (<i>SE</i>)	<i>df</i>	<i>y</i> (<i>SE</i>)	<i>df</i>	<i>y</i> (<i>SE</i>)	<i>df</i>
Intercept (γ_{00})	22.02 (0.22)***	34	22.06 (0.16)***	33	22.12 (0.16)***	32	22.12 (0.16)***	32	28.58 (0.54)***	32
Level 2										
Psychosocial safety climate					−0.17 (0.06)**	32	−0.16 (0.06)**	32	−0.19 (0.05)***	32
Work from home digital job demands			1.19 (0.21)***	33	0.89 (0.25)***	32	0.89 (0.25)***	32	0.51 (0.19)*	32
Level 1										
Psychosocial safety climate					−0.24 (0.02)***	1,920	−0.24 (0.02)***	1,919	−0.20 (0.02)***	1,751
Work from home digital job demands			1.00 (0.05)***	1,968	0.67 (0.05)***	1,920	0.67 (0.06)***	1,919	0.54 (0.06)***	1,751
Role									−4.39 (0.33)***	1,751
Time working from home									<0.01 (0.01)	1,751
Interaction										
PSC × work from home digital job demands							−0.01 (0.02)	1,919		
Additional Information										
Within-team (L1) variance (<i>r</i>)	59.32		51.3		45.74		45.74		41.22	
Intercept (L2) variance (u_0)	0.48*		0.01		0.01		0.01		<0.01	
2 Log-likelihood (FIML)	13,984.09		13,578.61		13,034.02		13,033.88		11,736.62	
Number of estimated parameters	3		5		7		8		9	
Within-unit pseudo R^2			0.14		0.23		0.23		0.31	
Between-unit pseudo R^2			0.98		0.98		0.98		0.99	

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

$N = 1,790$ – $2,019$ participants, $n = 35$ universities. Parameter estimates for hierarchical linear modelling are slope coefficients (γ) with robust standard errors in parentheses. All Level 1 estimates were group mean-centred except for role which was uncentred. All Level 2 variables were grand mean-centred. SE: standard error; L1: individual level; L2: group level; FIML: full information maximum likelihood.

away from the central tendency of the group. With these removed, hypothesis 1a was now supported, as PSC aggregated at the university level was significantly related to WFH digital job demands $y = -0.09$, $SE = 0.03$, $p < 0.01$ (Table

3, Model 1). PSC at the individual level was significantly related to WFH digital job demands $y = -0.10$, $SE = 0.01$, $p < 0.001$. These remained significant when controlling for role and time spent working from home (Table 3, Model 2).

The pseudo R^2 in Model 2 indicates that PSC accounts for 15% (and 17% with outliers) of the within-unit variance and 17% (vs. 28%) of the between-unit variance.

For consistency all further analyses were conducted with the outlier universities removed.

Hypothesis 1b proposed that WFH digital job demands would be positively related to work-life conflict. This relationship was significant at the university level, $\gamma=0.89$, $SE=0.25$, $p<0.001$, and individual level, $\gamma=0.67$, $SE=0.05$, $p<0.001$ (Table 4, Model 2). The relationship between PSC and work-life conflict was significant at the university level $\gamma=-0.17$, $SE=0.06$, $p<0.01$ and also at the individual level $\gamma=-0.24$, $SE=0.02$, $p<0.001$ (Table 4, Model 2). The within-unit pseudo R^2 in Model 2 indicates that PSC and WFH digital job demands account for 23% of the unexplained within-unit variance. Additionally, 98% of the between-unit variance was accounted for by the model. These results indicated that hypothesis 1b is supported.

When adding the control variables in Model 4 (Table 4), the direct effects remained significant. The relationship between PSC and work-life conflict was significant at the university level PSC $\gamma=-0.19$, $SE=0.05$, $p<0.001$ and individual level PSC $\gamma=-0.20$, $SE=0.02$, $p<0.001$. Additionally, the relationship between WFH digital job demands and work-life conflict remained significant at the university level $\gamma=0.51$, $SE=0.19$, $p<0.05$ and individual level $\gamma=0.54$, $SE=0.06$, $p<0.001$. This model account for 31% of the within-unit variance and 99% of between-unit variance.

Hypothesis 1c suggested that PSC is indirectly negatively related to work-life conflict through its negative relationship with WFH digital job demands. Due to the significant pathways from WFH digital job demands to work-life conflict and PSC to WFH digital job demands the mediation effect proposed in hypothesis 1c was tested. Using the Monte Carlo method with 95% confidence intervals, it was found that there was a significant indirect effect at Level 2 both before control variables (LL -0.16 UL -0.02) and after control variables were added (LL -0.10 UL -0.01). Additionally, the significant indirect effect was present at Level 1 before control variables (LL -0.08 UL -0.05) and after control variables added (LL -0.07 UL -0.04).

Hypothesis 2 predicted that PSC would moderate the positive relationship between WFH digital job demands and work-life conflict such that at high levels of PSC, the strength of the relationship would be reduced. In Model 3 (Table 4), an interaction was added to assess the moderation proposed. Hypothesis 2 was not supported, $\gamma=-0.01$, $SE=0.02$, $p>0.05$.

Discussion

The present study explores the effect of WFH digital job demands on work-life conflict across organisations using the extended PSC JD-R theoretical framework during the COVID-19 pandemic. The study also investigated potential antecedents to WFH digital job demands, specifically PSC. Using multilevel analysis, the hypothesis that organisation-level PSC is negatively related to individual WFH digital job demands was supported. This means when organisational level PSC is high, employees perceive less WFH digital job demands. Support was also found for a positive relationship between WFH digital job demands and employee perceptions of work-life conflict, with greater levels of WFH digital job demands at the organisation level resulting in higher levels of individual work-life conflict. Furthermore, the proposed mediation pathway was supported, with PSC at the organisational level indirectly affecting individual perceptions of work-life conflict through its negative relationship with WFH digital job demands. Support was not found for PSC moderating the relationship between WFH digital job demands and work-life conflict.

Theoretical implications

Our research contributes to the literature by identifying that adverse workplace digital demands may be influenced by the prevailing organisational climate for psychological health and safety, the PSC. This study is the first to investigate how the PSC relates to WFH digital job demands experienced by employees. The results align with previous research examining the PSC extended JD-R theoretical framework, which have found that higher levels of PSC in workplaces where employees are physically located in the workplace leads to other reduced job demands such as workload⁷², work pressure^{12, 73} and role conflict⁷⁴. The current study, however, expands the PSC extended JD-R theoretical framework by investigating its application within a flexible home-based digital environment extending the scope of this theory to new virtual technological interactive contexts. Testing how models of work stress, such as the extended PSC-JDR theoretical framework, can be applied to technological virtual work environments with the growth of psychosocial stressors related to human-to-machine communication, artificial intelligence and machine learning, is critical with the current digital transformation of work⁷⁵. This new theoretical knowledge is important to understand how to prevent emerging digitalised threats.

The results contribute to theoretical models of work-life

conflict^{44–46}) in two ways. First, the current study provides support for a model of work-life conflict built upon⁷⁶ the Work-Home Resources Model (W-HR)⁵⁰. It suggests multiple losses of resources where a low level of climate for psychological health and safety, PSC, depletes resources to generate reasonable and well-resourced ICTs. This leads to high levels of WFH digital job demands, further depleting resources to manage a balance between work and home or personal life activities. Conceptually, these findings support previous studies which have found support for the PSC to work-family conflict pathway (one aspect of work-life conflict)^{53, 54}. The results are also supported by a limited number of previous studies finding a negative relationship between digital job demands and work-life conflict^{36, 52}. Vaziri *et al.*⁵²) proposed that technostress while working from home can lead to work-family conflict, and Bordi *et al.*³⁶) found adapting to new information communication platforms and technical problems were related to well-being. However, these previous studies did not conceptualise these aspects of ICTs as digital job demands. The second theoretical contribution is the integration of a broader and more inclusive concept, work-life conflict, which may also be applied to individuals who live alone, and takes into account the impact of their own personal interests, as well as the activities needed to achieve a balanced home life. By merging measures of work-home conflict and work-self conflict to generate a measure of work-life conflict, the findings show that PSC and WFH digital job demands can affect this wider range of non-work activities, including home life and personal activities.

This study also has theoretical implications for the broader ICTs literature. A new measure to assess WFH digital job demands was introduced and its psychometric properties were examined. This study also proposes that ICT does not exist in a vacuum but can be influenced by the broader organisational climate context, i.e., by employees' perceptions of psychological health and safety support within their virtual workplace. It is suggested that digital work is influenced by capacity for training, infrastructure, and adequate time to learn digital platforms regardless of work location, which may be dependent on the PSC of the organisation, irrespective of where and when the work is completed. It is proposed that aspects of ICT can be conceptualised as demands within PSC extended JD-R theory, extending the conceptualisation of job demands to flexible, virtual work in non-physical workplaces. Furthermore, the WFH digital job demands scale relates to PSC and work-life conflict as expected, providing evidence of its validity within the nomological framework.

Practical implications

Based on the study findings there are several practical implications. First, to reduce work-life conflict while working from home, organisations should be mindful of employees' digital job demands. The current study suggests that it is important for employees to be provided with sufficient training, infrastructure and adequate time to learn digital platforms while working from home, as this can result in lower levels of work-life conflict. Additionally, the results suggest that management should improve levels of PSC by initiating regular online dissemination of policies, practices and procedures to support psychological health. This can be achieved via online meetings, shared platforms and online reporting as this can lead to lower WFH digital job demands and work-life conflict. This can be done within pre-established meeting times to reduce additional digital job demands. PSC levels could also be improved by posting printed documentation and information about psychological health policies and practices to employees' home addresses, as this would help disseminate the information while reducing the use of digital communications.

Furthermore, as these relationships are expected to occur when working at the workplace, improvements to PSC and digital job demands should be implemented for all staff, regardless of their work location.

Study limitations and future research

There are some limitations to this study. First, two universities were removed that were visually identified as outliers. This needs to be taken into consideration when interpreting the results. It should be noted that in the sample containing the outliers hypothesis 1b was supported and hypothesis 2 was not supported. The theoretical propositions are supported when the outliers are removed lending credence to the idea that they are outliers.

It must be noted that the upper-level sample size is quite small which is why the two outliers were having the effect of reducing the significance of the relationship. It cannot be ruled out that the relationship is weaker than expected because PSC may lose power outside of the immediate work context.

Second, the study is cross-sectional, therefore causal conclusions cannot be made. Longitudinal research is needed to test these relationships. Third, this study was only conducted within universities therefore results may not be generalisable to other industries. However, the study includes professional/non-academic employees from a range of areas, for example administration and legal, therefore similar findings may be found in a broader oc-

cupational sample. As no significant interaction was found between PSC and WFH digital job demands on work-life conflict, future research should investigate other potential moderators of this relationship such as organisational citizenship behaviour⁷⁷⁾ or job involvement⁷⁸⁾. While this study focuses on digital job demands, it is acknowledged that there are digital job resources that may be relevant to WFH¹⁰⁾. Further research should consider both digital job demands and digital job resources, within both the office and home environments.

Conclusion

This study highlights the possible unfavourable effect that WFH digital job demands may have on work-life conflict. It was found that PSC is associated with work-life conflict via its relationship with WFH digital job demands. This implies that organisations should aim to increase PSC levels through virtual dissemination and reinforcement of online policies, practices and procedures to support psychological health, reducing the WFH digital job demands, as this will improve employees' work-life conflict. Future research should investigate these relationships in employees working within the office setting to gain a greater understanding of digital job demands. To improve work-life conflict in a WFH context, it is important to improve PSC.

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