Enhancing employees' remote work experience: Exploring the role of organizational job resources☆

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ABSTRACT

The improvement of well-being and working conditions for remote employees has long been a topic of discussion in management literature. The COVID-19 lockdowns have brought this topic back to the forefront, with remote work becoming not just an option but a necessity in some cases. Therefore, understanding the organizational and individual-level variables that contribute to enhanced remote work experience for workers is critical today. However, academic research on the topic remains incomplete. The present study contributes to this topic by building a comprehensive research model, including relevant organizational variables connected to individual-level experiences of stress in remote work contexts. An examination of 471 observations of remote workers was conducted to test a moderated mediation model, which showed the significant role of participative leadership, goal clarity, and job resource adequacy in enhancing remote work self-efficacy as stress-coping mechanisms.

1. Introduction

Innovative working approaches have emerged in the current digital transformation era, reshaping our organizations (Di Nicola, 2017). In this context, the widespread integration of information and communication technologies (ICTs) plays a critical element in transforming the traditional work setting, introducing novel methods to organize and coordinate people's work (Donnelly and Johns, 2020). Moreover, unforeseen events (Troilo, 2023), such as the COVID-19 pandemic, highlight the need for organizations to adopt a forward-looking perspective (Raetze et al., 2021).

In other words, digital transformation creates a paradigm shift in how individuals work, challenging their thinking and influencing traditional processes and work strategies. Besides, the skills needed and the way in which organizational capabilities are developed have changed (De Miguel et al., 2022; Ogunrinde, 2022; Torre and Sarti, 2019). The global health emergency triggered by the COVID-19 pandemic led many entities to implement radical changes, fostering some new work practices such as remote working and teleworking (Chong et al., 2020).

In this unique and chaotic scenario, remote work is highly flexible, facilitating organizational adaptation to rapidly changing environments (Torre and Sarti, 2019). Therefore, this new work setting should be considered as an organizational model that enables workers to carry out their tasks and activities remotely, beyond the confines of an office (Gastaldi et al., 2014).

One of the major focuses of organizations has been understanding how to effectively reduce stress among employees (Espedido and Searle, 2018). However, despite over a decade of research on the impact of remote work on employee well-being and stress, the results are inconsistent (Perry et al., 2018). The COVID-19 pandemic has reignited the debate, shedding light on conflicting evidence on the relationship between stress and remote work (Sandoval-Reyes et al., 2021), particularly concerning the negative effects of forced remote work due to lockdowns (Sahut and Lissillour, 2023).

The state-of-the-art research on the relationship between remote work and stress has provided contrasting results. On one hand, research has proposed that remote work provides workers with more autonomy and possibilities to manage their job demands, reducing job stress (Delanoeije and Verbruggen, 2020; Duxbury and Halinski, 2014; Mann and Holdsworth, 2003). On the other hand, some studies have highlighted that remote workers can experience higher levels of stress,

depending on their situations at home (Song and Gao, 2020) or due to an intensified use of ICTs in the remote work context (Gualano et al., 2023). When such contrasting results emerge, it is necessary to further investigate the potential moderators or other interacting factors at different levels of analysis.

Previous research mainly focused on two levels of analysis. Most studies investigated individual workers' antecedents of remote work stress, focusing on individual-level characteristics (e.g., Giménez-Nadal et al., 2020) and behaviors (e.g., Goñi-Legaz et al., 2023). Few other studies extended the analysis to the home level (e.g., Hartig et al., 2007) and contextual factors, such as work-life balance, exploring how those variables are negatively or positively affected by the association between stress and remote work (e.g., Sandoval-Reyes et al., 2021). However, scant literature exists regarding the organizational antecedents that support workers in performing their activities in the remote work setting and how those variables relate to individual-level factors.

Our study aims to fill this gap by analyzing the role of the most relevant organizational variables in management literature on remote working—namely, participatory leadership style, goal clarity, and job resource adequacy—in reducing the workers' stress by supporting their self-efficacy during remote working hours at home.

To achieve this objective, this study embraces and extends a theoretical framework based on the Job Demands-Resources (JD-R) model (Bakker and Demerouti, 2007; Demerouti et al., 2001). By considering the variables linked with stress at both the individual and organizational levels for workers, we collected 471 surveys from workers engaged in remote work settings during the COVID-19 lockdowns. The data were analyzed through multiple linear regressions with bootstrapped confidence intervals to test the mediating and moderating relationships. The results indicate that organizational-level variables, such as participative leadership and goal clarity, enhance the workers' perception of higher self-efficacy when working alone in a remote work setting. This perception can be sustained by providing adequate material resources to remote workers. Without such resources, there is a risk of self-efficacy decreasing over time, as it is mainly constructed based on previous accomplishments and the ability to handle a particular challenge or hurdle (Bandura, 1997). These results have implications for both theory and practice.

First, our study contributes to the extension of the JD-R model by analyzing the role of organizational (Bakker and Demerouti, 2007) and individual or personal resources (Simbula et al., 2011; Xanthopoulou et al., 2007) in reducing exhaustion and improving individual well-being in the remote work setting. While the existing literature suggests the existence of some of the proposed relationships, none of the studies build a comprehensive model and test the role of both organizational and individual-level job resources in reducing remote work stress. Our framework proposes three main organizational-level (Bakker and Demerouti, 2007) job resources related to enhanced remote work stress coping: participative leadership, goal clarity, and job resource adequacy. These variables, in turn, impact the most critical personal-individual level job resource—self-efficacy (Simbula et al., 2011). Self-efficacy mediates the effect of participative leadership and goal clarity in reducing stress, with this reduction being moderated by job resource adequacy.

Second, by employing a sizable sample of workers "forced" into remote work activities, this study empirically tested the existence of the moderated-mediation model derived from the theoretical framework. Lastly, it explains the differences in the magnitude of providing workers with job-related material resources and stress reduction.

Understanding the significance of organizational-level variables in relation to remote work self-efficacy and worker well-being holds valuable practical implications for companies. By comprehending these factors, organizations can proactively improve remote workers' self-efficacy and reduce stress levels, boosting overall productivity and job satisfaction. This can be reached by ensuring that remote workers have access to the necessary tools and support required to effectively carry out their tasks. Other organizational implications include clearly defining the goals and expectations for workers' remote activities; increasing their participation in the decision-making process; and providing the right tools, technologies, and guidelines for out-of-office space design and organization.

Following the introduction, this paper is organized as follows: Section 2 addresses the theoretical background and the development of hypotheses; Section 3 details the methodology; Section 4 discusses the results; and Section 5 delves into the implications, limitations, and conclusions of the study.

2. Theoretical background and hypotheses development

Recently, scientific contributions have shown a growing interest in remote work, highlighting flexibility and the pivotal role of ICTs in enabling workers to work anywhere and at any time (De Leede and Heuver, 2016). Presently, an alternative *spatiotemporal scaling* (Sewell and Taskin, 2015) recognizes the need for a reorganization of the work toward a remote setting (Boorsma and Mitchell, 2011; Gastaldi et al., 2014; McEwan, 2016; Zheltoukhova, 2014).

Aligned with this trend, some scholars have studied the significant changes in work arrangements facilitated by technologies that influence organizational agility and workforce expectations (Bednar and Welch, 2020; McEwan, 2016). Moreover, several academic articles (i.e., Grant, 2020; Torre and Sarti, 2019; Yu et al., 2019) have identified definitions for this new work setting. Among these definitions, remote working is defined as the ability to work in a location different from the office (Krishnakumar and Choudhury, 2014; Cuel et al., 2020).

Therefore, many organizations opt for remote working due to its flexibility, allowing them to adapt quickly to various individual needs, not only during a pandemic emergency. However, this flexibility and relocation of workers outside the office, often to their homes, can introduce new sources of stress, such as increased time spent coordinating online, increased ambiguity, the presence of non-work stressors, and a decrease in socio-emotional support (Perry et al., 2018). Additionally, the remote or virtual working context is characterized by specific tasks and complexities for workers, such as the effective use of ICTs while performing tasks outside of the traditional office settings, efficient time management, autonomous work structuring, and the establishment of clear objectives for themselves (Adamovic et al., 2022). These specific technological, knowledge, skill, and activity-specific demands can be viewed as new job demands for the remote working context, necessitating adequate job resources; conversely, they may lead to increased exhaustion and stress among remote workers (Singh et al., 2022). Therefore, workers need job resources tailored to the remote work context to compensate for the additional job demands.

Starting from the analysis at the individual level, existing literature indicates that the main job resource in a remote work context is self-efficacy concerning technologies, skills, and activities characteristic of this working environment (Staples et al., 1999). In this context, self-efficacy represents individuals' beliefs about their capabilities to achieve specific performance levels (Bandura, 1994). Some studies have shown that self-efficacy empowers workers to control and successfully influence their work environment (Bakker and Demerouti, 2007; Luthans et al., 2008). Simultaneously, others have demonstrated that self-efficacy serves as a barrier in the stressor-strain relationship (Grau et al., 2001). In this vein, scholars have suggested that self-efficacy is directly related to positive emotions and job satisfaction (i.e., Luszczynska et al., 2009), which can prevent job stressors (Tugade and Fredrickson, 2004).

Besides, self-efficacy serves as a cognitive appraisal of stressful circumstances (Bandura, 1997). Stronger self-efficacy enables workers to overcome barriers and difficulties while seizing opportunities, implying that employees perceive stressful work situations as a challenge, which they then overcome (Jerusalem and Schwarzer, 1992). Therefore, in the context of remote work, higher remote working self-efficacy—namely,

the perceived ability to cope with the technologies and activities related to remote work (Adamovic et al., 2022; Staples et al., 1999)—can function as a personal job resource capable of balancing these new job demands and potentially decreasing the stress experienced by remote workers.

As we move from the individual to the organizational level of analysis, remote work requires different conditions in terms of work setting, such as new assets, processes, and people (Bednar and Welch, 2020). The basic premise of remote working is that managerial thinking should embody flexibility of working conditions, collaboration, innovation, and reconfiguration of spaces. However, this is only possible if the organization implements a cultural change that translates into reduced direct management control and increased employee responsibility (Angelici and Profeta, 2023). Thus, in a remote working environment, leadership cannot be characterized by direct control.

From an organizational perspective, the concept of leadership has been highly debated. It finds its theoretical basis in theoretical conceptualization, such as the distributed leadership theory (Gibb, 1954), shared leadership (Carson et al., 2007), and empowering leadership (Srivastava et al., 2006). Leadership is one of the most important factors impacting work activities in remote working settings (Contreras et al., 2020), which requires a leadership style that encourages high levels of participation (Joiner, 2009). As mentioned above, workers have to effectively manage their time, autonomously structure their work, and establish clear objectives for themselves (Adamovic et al., 2022)—activities that demand a clear understanding of the firm's and managers' expectations to avoid ambiguity and confusion.

In line with this, participative leadership entails a higher involvement of subordinates in the problem-solving and decision-making processes (Miao et al., 2013; Somech, 2006). In other words, participative leadership is realized when managers involve workers across different organizational levels in decision-making and objective definition processes (Spreitzer, 2007; Somech, 2006).

According to the social exchange theory, participative leadership may create higher levels of affective and normative organizational commitment among subordinates (Huang et al., 2010). In this perspective, employees with increased participation in decision-making, who take more responsibility for their activities, signify that their leader is engaged in the process of social exchange, leading in reciprocity. Moreover, with a more relevant involvement in decision-making, workers can reciprocate with a heightened sense of obligation toward the organization, resulting in a stronger normative commitment.

Consequently, since leadership cannot be performed with direct control in a remote work environment, promoting employee involvement in decision-making and adopting participative leadership becomes fundamental (Contreras et al., 2020; Iannotta et al., 2020). Additionally, from an empirical standpoint, different studies demonstrate that a participative leadership style is associated with workers' self-efficacy (Huang et al., 2010).

Building on the above-discussed theoretical and empirical insights, we contend that when remote workers are involved in the decision-making process through a participative leadership style, they are more capable of defining their job activities, managing their time, and establishing their objectives, thus increasing their perceived self-efficacy and reducing stress. Therefore, the first hypothesis regarding the relationship between participative leadership and perceived stress was proposed as follows:

H1. *Participative leadership can reduce remote workers' stress by improving their level of self-efficacy in the remote work context.*

As mentioned earlier, the importance of leadership becomes pronounced when facing changing behaviors, creating shared meanings, and integrating physical and technology-mediated interactions, as observed in remote working environments (Iannotta et al., 2020). This indicates that organizations and leaders supporting a remote working context must shift from a control-oriented approach to a management-by-objectives approach (Gastaldi et al., 2014).

In this context, remote workers must engage in participative decision-making to define goals and feel more involved in the organization's outcomes (Iannotta et al., 2020). Therefore, given the high flexibility, autonomy, and self-responsibility inherent in this kind of work setting, leaders should provide a cohesive setting where people actively engage in reaching organizational goals without direct managerial control (Boorsma and Mitchell, 2011; Morganson et al., 2010).

In such a work environment, management by objectives, along with clear goal definitions, supports individuals working from home or outside their workplace (Pérez et al., 2005; Sánchez et al., 2007). The literature suggests that clarity and ambiguity are used interchangeably in relation to job performance. Specifically, goal ambiguity is associated with lower performance (Song et al., 2020), while goal clarity is associated with higher job performance (Anderson and Stritch, 2016). However, regarding the perception of workers' self-efficacy, the role of goal clarity is less explored, with most studies devoted to investigating the role of self-efficacy in personal goal setting (Bandura and Locke, 2003; Phillips and Gully, 1997), while scant research addresses the relationship between organizational goals setting and worker self-efficacy.

Notably, goal ambiguity seems to be negatively related to workers' self-efficacy because of the unclear perception of how to contribute to organizational goals (Jung, 2014). Furthermore, empirical evidence suggests that goal specificity is positively and significantly related to self-efficacy (Wright, 2004).

In other words, in a work environment characterized by high clarity, employees understand what is expected from their activities. However, in situations of low clarity, employees face situational stress as they struggle to understand what is expected of them and how to work effectively (Gilboa et al., 2008; Jex et al., 2003). The setting of clear and specific goals is particularly crucial in a context characterized by a high level of autonomy, where goal clarity acts as a mediator between autonomy and performance (Gonzalez-Mulé et al., 2016).

Embracing the JD-R model perspective, this study argues that remote work is characterized by novel job demands for workers, such as self-definition of activities, time management, and objectives in a context different from the office. Specific job resources are required to balance them and prevent worker exhaustion. In a context characterized by a high level of autonomy, goal clarity is a critical job resource (Fürstenberg et al., 2021); therefore, we anticipate that an increased level of goal clarity is one of the main mechanisms through which participative leadership enhances self-efficacy and, consequently, reduces stress. This permits workers to clearly understand the organizational and managerial expectations and align their activities and objectives accordingly. Hence, the following hypothesis was proposed on the mediating role of goal clarity:

H2. *The positive relationship between participative leadership and remote workers' self-efficacy, reducing their stress, is mediated by the perception of goal clarity.*

In a remote setting, workers must autonomously define their activities and reach their goals (Bednar and Welch, 2020). Simultaneously, they face constraints while accessing the firm's infrastructure (hardware, software, internet connection, etc.), tools, and resources (Chong et al., 2020). Thus, it is crucial that they individually possess all the required technologies and tools in the location they choose to work (Angelici and Profeta, 2023). Even if material tools and physical resources are not the main focus of the more recent JD-R literature, the physical environment, encompassing the materials and workspace design, was recognized as a job resource in a seminal paper about the JD-R model (see Demerouti et al., 2001).

Generally speaking, in any working situation, workers should find themselves in a condition of resource adequacy (Rousseau and Aubé, 2010). These resources may include tools, materials, facilities, support services, space, and time (Fuller et al., 2006; Jex et al., 2003; Martínez-

Tur et al., 2005). The concept of resource adequacy implies that individuals are placed in working conditions with the necessary means to optimally develop their skills (Bacharach and Bamberger, 1995; Villanova and Roman, 1993). In the literature, job resource adequacy was recognized as strongly related to job satisfaction (Phillips and Freedman, 1984) and the development of workers' self-efficacy (Mathieu et al., 1993). Thus, inadequate job resources can likely frustrate and stress employees (Spreitzer, 1996). Extending this line of reasoning to the field of self-efficacy, we can assume that self-efficacy is vital for decreasing remote work stress; however, job resource adequacy is also critical in this relationship, given self-efficacy has to be proven and manifested in mastering skills and solving specific issues (Bandura, 1997), tasks unlikely to be realized in a remote working context without the necessary tools and resources. However, none of the reviewed studies tested the moderating effect of job resource adequacy, specifically in terms of technological infrastructures and decent workspace at home, on the relationships between self-efficacy and stress. In this line of reasoning, the following hypothesis was developed:

H3. *The reduction of stress generated by the enhanced remote workers' self-efficacy is moderated by the level of job resource adequacy to perform their jobs remotely. As resource adequacy increases, the relationship becomes stronger, further reducing stress.*

3. Methodology

3.1. Sample and data collection

Data collection was carried out between March 2020 and May 2021, during the peak of remote working implementation due to the COVID-19 lockdown across Europe. A mixed approach between random sampling and snowball sampling (Goodman, 2011) was employed. First, a random sample of respondents was selected, and then, we requested them to randomly send the survey to their professional contacts to maximize the sample size and overcome the difficulties related to accessing organizations and workers in a time of many limitations.

The final sample is fairly balanced in terms of the gender, age, professional roles, and seniority of the workers. Specifically, the sample comprises 471 observations, of which 47.8 % were made by women and 23.6 % by top and middle managers (the rest were non-mangers). In terms of education, 36.7 % graduated from high school, 20.8 % held a bachelor's degree, and 40.3 % held a master's degree. The average tenure was 8.4 years, with an average age of 37.1.

3.2. Measures

The theoretical constructs employed to test the hypotheses were drawn from the existing literature and adjusted to the remote work context to ensure respondent focus in this specific working environment. Exploratory factor analysis (EFA) with principal axis factoring and varimax rotation was deployed to test the item loadings in the preliminary data analysis phase. After these analyses, one observation was excluded due to the respondent's identical answers to survey questions with the same value, configuring itself as an outlier (Abbey and Meloy, 2017; Sullivan et al., 2021).

Most of the constructs showed a factor loading higher than 0.7, demonstrating a good level of item reliability (Hair et al., 2014). Eight out of 27 items displayed item loadings slightly lower than the suggested threshold of 0.7—namely, one reverse item in remote work stress (item loading of 0.59); two in remote work self-efficacy (item loading of 0.68 and 0.56); three in resource adequacy (item loadings of 0.66, 0.59, 0.54); one in goal clarity (item loading of 0.49); and one in participative leadership (item loading of 0.57). Nonetheless, the sample size of 471 allowed us to consider them as significant factor loadings, being above 0.3 with a sample size above 350 observations (see Hair et al., 2014). Accordingly, all the items were included in the analysis. However, as a

robustness test, the hypotheses were also tested, excluding all the items with loadings below 0.7, yielding identical and stronger results in terms of significance.

All the constructs displayed good internal consistencies, with Cronbach's Alphas above 0.7 (see Table 1). The constructs were developed as follows:

Remote work stress (RWS): The four-item scale by Motowidlo et al. (1986) addressing occupational stress was fitted to the remote work context. An illustrative item is "When I work in remote work, very stressful things happen to me."

Remote work self-efficacy (RWSE): The eight-item short scale from Schyns and von Collani (2002) measuring self-efficacy was reframed for remote working activities. An illustrative item is "If I am in trouble while working remotely, I can usually think of something to do."

Remote work job resource adequacy (RWJRA): The seven-item scale of job resource adequacy (Rousseau and Aubé, 2010) was adapted and framed for remote work resources. Examples of items are "I have the technological infrastructure (e.g., broadband, fiber) adequate to carry out my job in the remote work setting" and "I have the necessary space to carry out job activities in remote work."

Goal clarity (GC): The four-item scale of goal clarity (Lee et al., 1991) was employed to measure the workers' perception of organizational goals. An example of an item is "At work, I have specific and clear goals to achieve."

Participative leadership (PL): The level of participative leadership was measured by employing an adapted version of the six-item scale by Miao et al. (2013). An illustrative item is "My supervisor gives all team members the opportunity to express their opinions."

Control variables: As controls were taken into consideration, some demographics potentially linked with the development of remote self-efficacy (i.e., age and degree) and the level of stress that can potentially develop in the remote work context (i.e., gender and managerial role). Namely, age was controlled by employing a continuous variable. The degree was controlled with a dummy variable equal to 1 for individuals with at least a bachelor's degree and 0 otherwise. The managerial role was accounted for using a dummy variable (labeled as "manager") equal to 1 when the individual had a middle or top management role (0 otherwise). Work experience was controlled with a continuous variable; lastly, gender was a dummy variable equal to 1 for respondents who identified as female (0 otherwise). Besides, since some variables could potentially be linked with the difference between service and manufacturing industries (i.e., goal clarity, participative leadership), the variability was controlled by employing one dummy variable equal to 1 if the organization was a part of the manufacturing industry or 0 for those in the service-based industry (labeled as "manufact").

3.3. Data analysis

To mitigate the problem of common method variance (CMV), this study adhered to the recommended guidelines and solutions outlined by Podsakoff et al. (2003) during both the planning and implementation stages of the survey. Additionally, the survey was designed to preserve the respondents' confidentiality and eliminate any questions eliciting socially desirable responses or having subtle cues or unclear meaning, as identified by Podsakoff et al. Furthermore, the study utilized Harman's single-factor test, as described by Podsakoff et al., to assess the presence of CMV after data collection. The results revealed that the unrotated factor matrix's one factor accounted for only 32 % of the variance, which is well below the commonly accepted threshold of 50 %, indicating that CMV is not a significant concern in this study.

An analysis of variance (ANOVA) was employed to investigate the existence of nonresponse bias by comparing the characteristics of early and late respondents. The outcome revealed no notable distinctions between the two groups, suggesting that nonresponse bias is not a significant concern in the current study.

Lastly, the developed hypotheses were tested using multiple

Table 1

The means, standard deviations, inter-construct correlations, and internal consistency of the constructs.

Construct	Mean	SD	Alpha	1	2	3	4	5
1. RWS	2.33	0.98	0.86	1				
2. RWSE	3.96	0.74	0.91	−0.34**	1			
3. RWJRA	4.04	0.83	0.87	−0.27**	0.62**	1		
4. GC	4.06	0.66	0.77	−0.9[n.s.]	0.38**	0.40**	1	
5. PL	3.91	0.76	0.87	−0.14**	0.25**	0.32**	0.40**	1

Alpha = Cronbach's Alpha; SD = standard deviation.

** significant at $\alpha = 0.01$ (two-tailed), [n.s.] not significant.

regression analysis with bootstrapped confidence intervals via the PROCESS macro (Hayes, 2022) in SPSS 28. The results are presented in Tables 2, 3, 4, and 5. The moderation effect is visualized in Fig. 2.

4. Results

The empirical analyses suggest that all the developed hypotheses within our research model (see Fig. 1) have significant support in our data. The first hypothesis suggests that remote workers perceive lower stress in remote working activities (RWS) when they are involved in the decision-making process through a participative leadership style (PL), as this involvement boosts their perceived self-efficacy in the remote work context (RWSE). The results (see Table 2), first of all, confirm a positive and significant relationship between PL and RWSE (b = 0.23, p < 0.001)

and the existence of a negative and significant relationship between RWSE and RWS (b = −0.40, p < 0.001). At the same time, in line with our hypotheses, there were no direct and significant relationships between PL and RWS but only entirely indirect effects mediated by the RWSE. As shown in the mediation analysis computed with bootstrapped upper (BootULCI) and lower (BootLLCI) confidence intervals, the confidence interval of the negative indirect effect of PL over RWS through RWSE (effect = −0.09) did not contain zero (BootLLCI = −0.14; BootULCI = −0.05), confirming its significance.

The second hypothesis posits that the positive relationship between involvement in a participative leadership style and the perception of self-efficacy is mediated by workers' perception of goal clarity (GL), leading to a further reduction of workers' stress. The results also confirm our second hypothesis, as shown in Table 3. First of all, workers involved

Table 2

Effect of PL on RWS mediated by RWSE.

Outcome variable:	RWSE					
Model summary						
R	R-sq	MSE	F	df1	df2	p
0.33	0.11	0.5	7.83	7	454	0.000
Model						
	b	se	t	P	LLCI	ULCI
constant	2.77***	0.23	12.01	0.000	2.32	3.23
PL	0.23***	0.04	5.27	0.000	0.14	0.31
controls						
Gender	−0.25***	0.07	−3.81	0.000	−0.39	−0.12
Age	0.01*	0	2.11	0.036	0.00	0.02
Degree	0.15*	0.07	2.13	0.033	0.01	0.29
Tenure	0.00[n.s.]	0.01	−0.63	0.528	−0.01	0.01
Manager	−0.21[n.s.]	0.13	−1.62	0.107	−0.47	0.05
Manufact	0.06[n.s.]	0.09	0.73	0.466	−0.11	0.23

Outcome variable:	RWS					
Model summary						
R	R-sq	MSE	F	df1	df2	p
0,38	0.15	0.83	9.75	8	453	0.000
Model						
	b	se	t	p	LLCI	ULCI
constant	4.45***	0.34	13.02	0.000	3.78	5.12
PL	−0.07[n.s.]	0.06	−1.14	0.256	−0.18	0.05
RWSE	−0.4***	0.06	−6.65	0.000	−0.52	−0.28
controls						
Gender	0.14[n.s.]	0.09	1.55	0.122	−0.04	0.31
Age	−0.02**	0.01	−2.72	0.007	−0.03	0
Degree	0.09[n.s.]	0.09	0.97	0.334	−0.09	0.27
Tenure	0.02**	0.01	3.43	0.001	0.01	0.04
Manager	0.09[n.s.]	0.17	0.52	0.603	−0.24	0.42
Manufact	−0.02[n.s.]	0.11	−0.17	0.866	−0.24	0.2
Direct effect of PL on RWS						
	Effect	se	t	p	LLCI	ULCI
	−0.07	0.06	−1.14	0.256	−0.18	0.05
Indirect effect of PL on RWS						
	Effect	BootSE	BootLLCI	BootULCI		
via RWSE	−0.09	0.02	−0.14	−0.05		

n.s. not significant; *p < 0.05; **p < 0.01; ***p < 0.001.

R-sq = R squared; MSE = Mean Squared Error; F = F-test; df = degree of freedom; se = standard error; p = p-value; LLCI = Lower-Level Confidence Interval; ULCI = Upper-Level Confidence Interval; Boot = bootstrap 5000 samples.

Table 3

Effect of PL on RWSE mediated by GC.

Outcome variable:	GC					
Model summary						
R	R-sq	MSE	F	df1	df2	p
0.43	0.18	0.36	14.42	7	454	0.000
Model						
	b	se	t	p	LLCI	ULCI
constant	2.56***	0.20	13.03	0.000	2.17	2.94
PL	0.35***	0.04	9.52	0.000	0.28	0.42
controls						
Gender	0.04[n.s.]	0.06	0.77	0.440	−0.07	0.16
Age	0.00[n.s.]	0.00	0.43	0.665	−0.01	0.01
Degree	−0.01[n.s.]	0.06	−0.19	0.849	−0.13	0.11
Tenure	0.00[n.s.]	0.00	0.69	0.492	−0.01	0.01
Manager	0.26*	0.11	2.43	0.020	0.04	0.48
Manufact	0.05[n.s.]	0.07	0.73	0.466	−0.09	0.20

Outcome variable:	RWSE					
Model summary						
R	R-sq	MSE	F	df1	df2	p
0.45	0.20	0.45	14.39	8.00	453	0.000
Model						
	b	se	t	p	LLCI	ULCI
constant	−2.16***	0.26	−8.43	0.000	−2.67	−1.66
PL	0.09*	0.05	2.09	0.038	0.01	0.18
GC	0.38***	0.05	7.34	0.000	0.28	0.49
controls						
Gender	−0.27***	0.06	−4.29	0.000	−0.40	−0.15
Age	0.01*	0.00	2.08	0.039	0.00	0.02
Degree	0.16*	0.07	2.32	0.021	0.02	0.29
Tenure	−0.00[n.s.]	0.01	−0.91	0.366	−0.01	0.01
Manager	−0.31*	0.12	−2.50	0.013	−0.56	−0.07
Manufact	−0.04[n.s.]	0.09	0.52	0.604	−0.12	0.20
Direct effect of PL on RWSE						
	Effect	se	t	p	LLCI	ULCI
	0.09	0.04	2.08	0.038	0.01	0.18
Indirect effect of PL on RWSE						
	Effect	BootSE	BootLLCI	BootULCI		
via GC	0.14	0.03	0.08	0.20		

n.s. not significant; *p < 0.05; **p < 0.01; ***p < 0.001.

R-sq = R squared; MSE = Mean Squared Error; F = F-test; df = degree of freedom; se = standard error; p = p-value; LLCI = Lower-Level Confidence Interval; ULCI = Upper-Level Confidence Interval; Boot = bootstrap 5000 samples.

in a context with PL perceived a higher GL (b = 0.35, p < 0.001), showing that those workers, on average, had more goal clarity when involved in the decision-making process with their leaders. Moreover, this goal clarity is positively associated with the perception of RWSE (b = 0.38, p < 0.001). The mediation analysis confirms an indirect RWSE for PL through GL (effect = 0.14), and it is significant (BootLLCI = 0. 08; BootULCI = 0. 20) and bigger than the direct ones (effect = 0.09).

Lastly, the third hypothesis was supported in the empirical analysis (see Tables 4 and 5), showing that remote work self-efficacy (RWSE) reduces workers' stress (b = −0.40, p < 0.001), and this effect is moderated by the resource adequacy (RWJRA) of workers in their remote work setting. The interaction effect RWSE*RWJRA is negative and significant (b = −0.17, p < 0.001), meaning that the adequacy of the resources provided to the workers helps in reducing their stress perception even if they already possess strong self-efficacy about remote work.

The magnitude of this moderation effect can also be seen in Fig. 2, where the slope of the regression line between RWSE and RWS, in the case of plus one standard deviation (+1 SD) of RWJRA, is steeper compared to the line of minus one standard deviation of RWJRA (−1 SD). Moreover, we tested if the H1 and H2 effects also hold in the presence of the moderation effect of RWJRA, finding that both the mediated paths are significant (see Table 5). Overall, the model resulting

Table 4

Effect of RWSE on RWS moderated by RWJRA.

Outcome variable:	RWS					
Model summary						
R	R-sq	MSE	F	df1	df2	p
0.45	0.18	0.80	10.76	9.00	452	0.000
Model						
	b	se	t	p	LLCI	ULCI
constant	2.69***	0.20	13.24	0.000	2.29	3.09
RWSE	−0.40***	0.08	−53.33	0.000	−0.55	−0.25
RWJRA	−0.19**	0.07	−28.31	0.005	−0.32	−0.06
RWSE * RWJRA	−0.17***	0.05	−3.72	0.000	−0.26	−0.08
Controls						
Gender	0.13	0.09	15.10	0.132	−0.04	0.30
Age	−0.02**	0.01	−29.25	0.004	−0.03	−0.01
Degree	0.11	0.09	11.82	0.238	−0.07	0.29
Tenure	0.02***	0.01	3.59	0.000	0.01	0.04
Manager	0.08	0.17	0.50	0.617	−0.25	0.41
Manufact	−0.02	0.11	−0.17	0.864	−0.23	0.20
	R-sq change	F	df1	df2	p-value	
RWSE * RWJRA	0.03***	13.82	1.00	452	0.000	

n.s. not significant; *p < 0.05; **p < 0.01; ***p < 0.001.

R-sq = R squared; MSE = Mean Squared Error; F = F-test; df = degree of freedom; se = standard error; p = p-value; LLCI = Lower-Level Confidence Interval; ULCI = Upper-Level Confidence Interval.

Table 5

Indirect effects of PL on RWS mediated by GC and RWSE moderated by RWJRA.

Indirect effect PL ➔ RWSE ➔ RWS				
RWJRA	Effect	BootSE	BootLLCI	BootULCI
−0.75	−0.03	0.01	−0.06	−0.002
0.1	−0.04	0.02	−0.08	−0.004
0.82	−0.05	0.03	−0.11	−0.01
Index of moderated mediation				
	Index	BootSE	BootLLCI	BootULCI
RWJRA				

Indirect effect PL ➔ GL ➔ RWSE ➔ RWS				
RWJRA	Effect	BootSE	BootLLCI	BootULCI
−0.75	−0.04	0.01	−0.07	−0.01
0.1	−0.06	0.02	−0.09	−0.03
0.82	−0.07	0.02	−0.12	−0.03
Index of moderated mediation				
RWJRA	Index	BootSE	BootLLCI	BootULCI
RWJRA	−0.02	0.01	−0.04	−0.01

SE = Standard Error; LLCI = Lower-Level Confidence Interval; ULCI = Upper-Level Confidence Interval; Boot = bootstrap 5000 samples.

from the three hypotheses together finds support from the index of moderated mediation in Table 5, which is significant, suggesting that the hypothesized reduction of stress is significant, considering both the mediation paths and the moderation simultaneously. To conclude and summarize, the empirical results support all the proposed hypotheses.

5. Discussion and conclusions

The present study aimed to expand the existing literature on remote work and workers' well-being by specifically examining the impact of both individual- and organizational-level variables linked with remote work stress coping. To achieve this goal, it embraced and extended a theoretical framework based on the Job Demands-Resources (JD-R) model (Bakker and Demerouti, 2007; Demerouti et al., 2001),
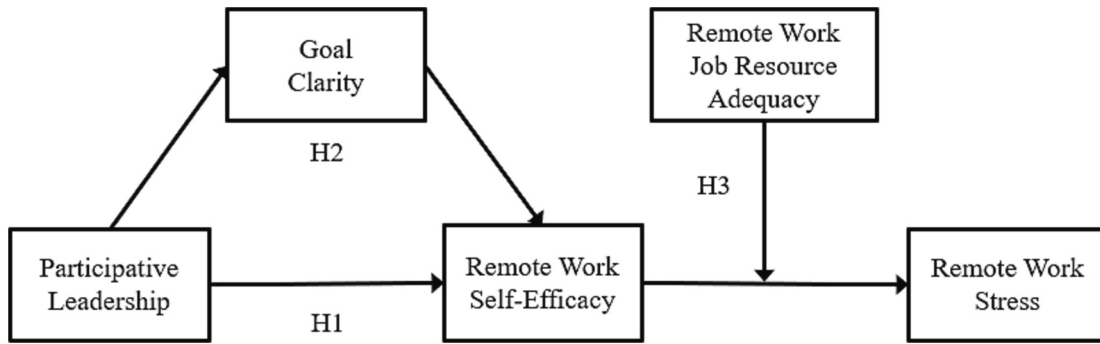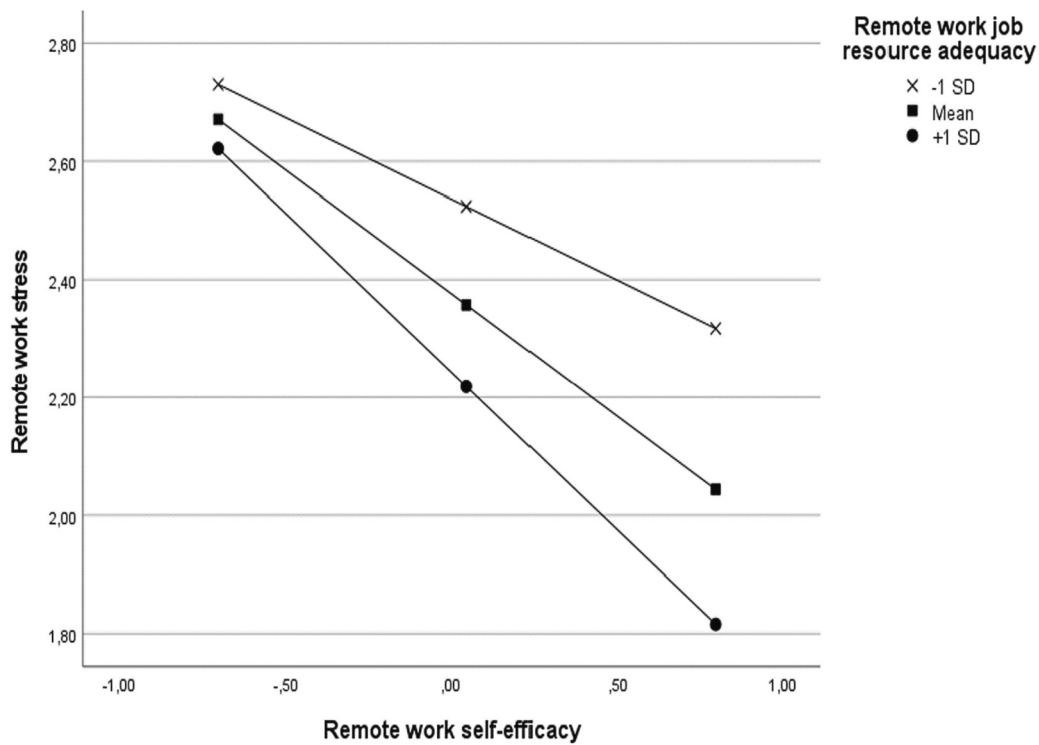
Fig. 1. Research model.

Fig. 2. Moderating effects of RWJRA on the relationship between RWSE and RWS.

considering both personal resources and organizational ones.

All the concepts and relationships introduced in our theoretical framework are individually well-known in the management literature. However, they have not yet been analyzed as a comprehensive model nor contextualized in the remote working setting.

The sudden shift to remote work as a result of the COVID-19 pandemic and related lockdowns reignited the managerial debate about how to facilitate efficient remote work and preserve workers' mental well-being. This was especially critical during the pandemic, as lockdowns and forced remote work arrangements led to increased stress levels and burnout for many workers.

Managerial discussions during the pandemic highlighted the importance of a management-by-objectives approach and providing workers with the necessary resources (such as ergonomic chairs, laptops, and smartphones) to work efficiently from home. However, academic research is lacking on the organizational variables most effective in reducing worker stress in the context of partially "forced" remote work adoption, such as from 2020 to 2021.

Previous studies have underlined that remote work self-efficacy is a central job resource for remote or virtual workers, and other streams of research have investigated the role of participative leadership and goal clarity in supporting workers self-efficacy.

However, those relationships are yet to be investigated with a focus on remote work self-efficacy, which, as mentioned above, introduces novel job demands and challenges for workers. Also, though the relationship between workers' self-efficacy and stress is well-established in the management literature, our study has identified additional gaps in the existing evidence.

First, the literature lacked a comprehensive model incorporating all the organizational- and individual-level resources related to remote work stress. Second, the organizational level variables, participative leadership, and goal clarity have yet to be investigated in the remote working context. Third, the moderation role of resource adequacy is a novel insight into the debate about coping with remote work stress.

To address these gaps, the present study proposed a comprehensive model that accounts for organizational-level job resources, such as clarity of organizational goals and participative leadership and their relationship to personal job resources and remote working self-efficacy, which, in turn, is linked to the reduction of workers' stress in the remote work context. Additionally, it re-proposes the central role of physical

and material resources, as introduced in the seminal paper about JD-R (Demerouti et al., 2001), by hypothesizing the moderation role of resource adequacy. The results suggest that involving workers in the decision-making process and providing them with clear goals directly impacts remote work self-efficacy and, consequently, reduces the workers' stress. However, the impact of remote work self-efficacy is strongly moderated by job resource adequacy. In other words, having access to adequate resources can further enhance the positive impact of self-efficacy on worker stress reduction. This highlights the importance of organizations not only providing the necessary resources but also fostering autonomy and support for remote workers to feel empowered and in control of their work.

This study's findings have practical implications for managers and organizations navigating the ongoing challenges of remote work during the pandemic. By recognizing the importance of organizational-level variables on remote work self-efficacy and worker well-being, organizations can take steps to improve remote workers' self-efficacy and reduce stress by providing the necessary resources, goal clarity, and opportunities for worker participation. Encouraging a culture of trust and autonomy by recognizing remote workers' autonomy, supporting their self-direction, and fostering communication and collaboration among remote workers by providing them with the necessary tools and resources to facilitate communication and collaboration with colleagues is essential. Lastly, the challenges of remote work must be addressed through regular check-ins and feedback to remote workers and by addressing any issues that may arise.

In conclusion, this study serves as a call to action for managers and organizations to prioritize the well-being of their remote workers by understanding the impact of organizational-level variables on remote work self-efficacy and taking steps to address it. By doing so, they can not only improve the productivity and efficiency of remote workers but also promote a more positive and healthy work environment.

Despite its contributions, this study has some limitations. First, relying on self-reported perceptual data from a single key informant in the same period may weaken the study's validity, even if substantial precautions were taken to mitigate common method bias. This implies that the study's results may be influenced by the subjectivity of the key informant and may not accurately reflect the experiences of all workers in the organization.

Second, the sampling method could have led to data collection bias despite the randomization of the initial sample. The sample may not be representative of the population of remote workers, and the results may not be generalizable to other organizations or remote workers. Additionally, the sample size might not have been large enough to detect subtle differences or nuances in the data. Additionally, several studies in the same period of analysis applied the snowballing approach to increase the chance of reaching individuals working during lockdowns. This approach may also have introduced bias, as it relied on the participants' willingness to refer others, which may have been influenced by their own experiences and attitudes.

Future research can address these issues by surveying multiple workers within the same organizations, employing longitudinal data collection, or randomly selecting all the respondents. When surveying multiple workers, the results can be compared and cross-checked for validity. Longitudinal data collection can provide a more comprehensive understanding of remote workers' experiences over time. Random sampling can help to ensure that the sample is representative of the population and that the results are generalizable to other organizations. Additionally, future studies can explore other data collection methods, such as phone or mail surveys, which can increase the overall response rate and decrease the potential bias.

CRediT authorship contribution statement

Ludovico Bullini Orlandi: Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Conceptualization.

Eleonora Veglianti: Writing – review & editing, Writing – original draft, Conceptualization. **Alessandro Zardini:** Writing – review & editing, Writing – original draft, Data curation. **Cecilia Rossignoli:** Writing – review & editing, Writing – original draft, Supervision.

Data availability

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