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Supervisory performance in telework: the role of job demands, resources, and satisfaction with telework

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Introduction: Digitalization and the pandemic have transformed work, increasing flexibility, and remote arrangements. A critical factor in these transformations' success is supervisors' competencies. Consequently, new tools for assessing supervisory performance are required, particularly considering subordinates' evaluations. This study investigates the role of three telework resources (structural support, telework readiness, and monitorization) and three demands (workload, isolation, and information overload) in predicting employees' evaluation of supervisors, with satisfaction with telework as a moderator.

Methods: A survey among 322 Spanish teleworkers was conducted in July 2023. Specific scales for measuring Telework Supervisory Performance, as well as Telework Resources and Demands, were developed. Confirmatory Factor Analysis (CFA), correlations, and Structural Equation Modeling (SEM) were conducted.

Results: Organizational structural support positively correlates with subordinates' evaluation of their supervisor, while monitorization shows a negative relationship. Telework demands studied demonstrated no significant relationship with the outcome. Interaction effects between resources and satisfaction with telework increased the relationship with supervisor evaluations.

Discussion: This research shows that organizational support significantly enhances supervisor evaluations in remote work settings, particularly among satisfied teleworkers. The findings also reveal that high monitoring levels can negatively impact supervisor assessments. Conversely, job demands were not significantly linked to supervisor evaluations. Implications for workers and organizations are discussed.

KEYWORDS

telework, remote work, supervisors, supervisory performance, job demands, job resources, performance, satisfaction

1 Introduction

The digital transformation has significantly impacted the nature and organization of work. The integration of information technology into the workplace has made the physical location of work a changing reality, enabling a shift toward flexible work arrangements such as telework (Athanasiadou and Theriou, 2021; Gohoungodji et al., 2022). Although varied in its definitions across studies, telework generally refers to work arrangements where employees perform their duties from non-fixed locations or off-premises, utilizing

information and communication technologies to stay connected with the workplace (Allen et al., 2015; Vartiainen, 2024). The terms "telecommuting," "remote work," "virtual work," and "home-based work" are often used interchangeably, reflecting the diverse forms of telework arrangements that range from home-based to mobile teleworking (Messenger and Gschwind, 2016).

All these different telework arrangements had been accelerated by various factors, including demographic and social changes such as the emphasis on work-life balance, technological advancements like AI developments, and health crises like the COVID-19 pandemic, requiring rapid adaptation to telework practices to ensure business continuity and performance (Athanasiadou and Theriou, 2021; Chambel et al., 2022; González-Anta, 2024). Although the pandemic work scenario is fading, data shows that more than a third of US employees who can telework still do it full-time, and more than 40% have hybrid work arrangements (Pew Research Center, 2023). Data in the EU shows that remote work arrangements rose 8% after the pandemic (Eurostat, 2022). Similarly, the digitalization of the economy and employment shows a growing tendency at the regional level. In this vein, data from Spain continues to outperform the European Union average in the DESI (Digital Economy and Society Index), with particular emphasis on digital public services and connectivity (European Commission, 2023).

Due to the growing tendency of these work arrangements, studies are urgently needed to delve into the variables influencing sustainable telework contexts. In this trend, different efforts have been made to explore and understand teleworking, especially during and after the pandemic. For example, Gandini and Garavaglia (2023) studied Italian knowledge professionals' views on transitioning to telework during the initial nationwide quarantine. Similarly, Peiró and Soler (2020) and the Consejería de Economía, Hacienda y Empleo (2023) explored the evolution of teleworking in Spain, researching its comparative evolution at the national and European level and its implications in rural areas. On a similar page, the present article is part of a Valencian research observatory that aims to understand and prospect the teleworking conditions, profile, and perceptions of teleworkers to comprehend the spread of telework after the pandemic and provide ideas and recommendations for policy development (Peiró et al., 2022, 2023b).

Despite this, as telework becomes increasingly prevalent and different adjustments happen, it is crucial to examine not only its broad tendencies but also the specific dynamics within teleworking arrangements. One key aspect that merits particular attention is competent supervision performed in remote work settings. In this complex context, teleworkers' supervisors may exert a cascading influence, with their characteristics, behaviors, and actions having a permeating effect on their subordinate employees (Bakker et al., 2023; Bell et al., 2023). However, the shift to telework significantly altered the traditional supervisor-employee relationship, requiring teleworkers' supervisors to adapt their face-to-face competencies to the remote context, as the previous valuable competencies became obsolete and required to be updated and adapted (Peiró and Martínez-Tur, 2022).

1.1 Supervisors' performance in telework contexts

Supervisors in telework contexts must adapt their management approaches to the complexities of remote management mediated by ICT. The initial shift from traditional to remote supervision requires adaptability, emphasizing leveraging digital tools to maintain team cohesion, wellbeing, and productivity (Contreras et al., 2020; Bell et al., 2023). Remote supervision also requires adapting prior competencies to deal with specific telework tasks and contexts. Nevertheless, supervisors differ in their level of readiness to deal with the challenges of remote work.

Given this perspective, the construct of *digitalized competencies* formulated by Peiró and Martínez-Tur (2022) arises as a key potential requirement for teleworkers' supervisors. Digitalized competencies refer to non-digital competencies enacted in telework contexts, mediated by digital technologies, which require a substantial transformation of how they must be enacted to be effective. In other words, supervisory competencies in telework contexts imply a significant adaptation of face-to-face supervisory competencies (e.g., setting goals and fostering a positive climate) to the digital context. In this vein, telework supervision diverges from conventional supervisory performance as it relies and depends on technology, requiring an enhanced focus on results-oriented management and the ability to motivate and engage employees from a distance. The absence of physical presence and potential risks that may arise, such as social loafing (Monzani et al., 2014), require supervisors to develop new strategies for their tasks of monitoring performance and facilitating team dynamics (Dambrin, 2004; Peñarroja et al., 2017; Kim et al., 2021).

In addition, supervisors will also adapt to the environment, for example, being skillful in choosing the most efficient tool or media (Peiró and Martínez-Tur, 2022). Furthermore, they must effectively bridge the perceived gap between teleworkers and on-site employees to foster a collaborative environment. How supervisors manage telework arrangements can shape individual perceptions of fairness (Kim et al., 2021). Thus, supervisors in telework contexts urgently require transforming their roles and competencies, considering digital technologies' impact on their tasks and duties. We must note that our focus is on base-level supervision and the essential tasks that this role performs. Consequently, if this transformation is not properly conducted, supervision could become an additional demand for teleworkers, triggering their burnout through the health impairment process (Bakker and Demerouti, 2017, 2024).

Therefore, evaluating supervisors in telework settings must reflect the unique competencies required for effective remote or hybrid supervision. Despite this, the topic of supervisors in telework contexts has often been neglected in literature (Park and Cho, 2020). Prior research has focused on the perceptions and influences of supervisors, as leaders, on their followers (Bakker et al., 2023; Bell et al., 2023) more than on evaluating the supervisors' functions by their followers. However, teleworkers' supervisors' basic behaviors-such as work-life balance support-have a key enhancing role in positive outcomes like engagement (Chambel et al., 2022).

In brief, it is imperative to acknowledge that while a substantial corpus of research has explored the construct of virtual supervision through diverse theoretical lenses and conceptualizations (e.g., Ernst et al., 2022; Banker et al., 2023; Bell et al., 2023), the present study covers a gap by focusing specifically on the tasks of direct supervisors overseeing teleworkers. This implies that we will evaluate supervisory performance in a more transactional and narrowed context, attending to everyday work activities—e.g., appraising performance, setting goals, managing teamwork, and digital communication- but aiming to adequately capture the skills needed for telework supervision, such as digital communication proficiency (e.g., conducting virtual meetings), managing distributed teams, evaluating performance remotely, and promoting an inclusive and supportive work culture despite the distance. Consequently, we respond to an increasing demand for assessing supervisors' capacity to promote employee autonomy and efficacy while ensuring remote workers' high productivity levels, sustainability, and wellbeing. We propose that research should also assess supervisors' effectiveness in leveraging technology to facilitate collaboration and innovation within their teams (Dambrin, 2004; Kim et al., 2021).

1.2 Job demands and resources in telework

The Job Demands-Resources (JD-R) model proposes that employee wellbeing is influenced by the balance and adjustment between job demands (aspects of a job requiring sustained physical and psychological effort) and job resources (aspects of a job that help achieve work goals, reduce job demands, and stimulate personal growth and development). This model has been widely used in organizational psychology, and empirical data supports its tenets (Mazzetti et al., 2021; Claes et al., 2023). The model suggests that in a work context, excessive demands -such as those that can be brought to teleworkers under inadequate supervision- deplete employees' health and energy and negatively influence the performance of the employees due to the extra effort required through the health-impairment process. In parallel, job resources (e.g., supervisors' support) encompass factors inherent to the job that mitigate the influence of work-related demands, facilitate motivation, goal attainment, and personal growth, and make workers thrive in turbulent contexts through the motivational process (Peters et al., 2023; Bakker and Demerouti, 2024). This dual pathway is crucial for understanding how different factors in the workplace contribute to stress and work engagement (Demerouti et al., 2001; Bakker and Demerouti, 2007, 2017; Bakker et al., 2023). Yet, when analyzing the specific job demands and resources that may be influencing performance in a given scenario or organization, we must consider that there are no fixed characteristics or features that can be either labeled as demands or resources (Bakker and Demerouti, 2024). In contrast to classic work design theories (e.g., Job Characteristics Model, Hackman and Oldham, 1976), JD-R theory acknowledges that each context may present specific demands and/or resources (Bakker and Demerouti, 2024).

Under the lens of the JD-R model, and based on the comprehensive analysis of telework context, it becomes evident that the digitalization of jobs and telework introduces new and unique job demands and resources, significantly affecting employee wellbeing, performance, and satisfaction (Gajendran and Harrison, 2007; Pulido-Martos et al., 2021; Chambel et al., 2022; Demerouti, 2022; Peiró et al., 2023b; González-Anta, 2024). Consequently, considering the distinct demands and resources inherent to telework arrangements, it is paramount to identify the specific working conditions and experiences associated with telework supervision. According to the JD-R model, designing and conducting effective telework involves minimizing telework-specific demands (e.g., through clear communication and role clarity) and maximizing resources (e.g., through technological support and opportunities for virtual social interaction and emotional display) to sustain employee wellbeing and performance (González-Anta et al., 2021; Jamal et al., 2021; Peiró et al., 2023b).

This optimization process is primarily undertaken by managers and supervisors, wherein they shape the work environment for employees (Pulido-Martos et al., 2021; Bakker et al., 2023), and their effectiveness in supervising teleworkers will be shaped by different contingencies that can operate as job resources or demands (Bell et al., 2023). Supervisors' activities for telework optimization imply setting performance targets, delineating job tasks and responsibilities, and providing the necessary resources to carry out those tasks effectively (Demerouti et al., 2001). Yet, this task can be complex due to the wide range of relevant resources and demands that must be carefully analyzed, prioritized, and effectively managed when teleworking. Based on this premise, we consider that job demands and resources in telework contexts will influence telework supervisory performance appraised by the teleworkers.

In the present study, we select six specific job characteristics that may influence teleworkers' supervisor performance. First, we identify the resources that directly impact a supervisor's ability to manage remote teams effectively: structural support, readiness for telework, and monitoring. We select these based on a classical view of the JD-R theory, which considers a top-down approach to job design regarding the resources (Bakker and Demerouti, 2017) so that the resources provided by the organization are the ones that will most influence telework supervisory performance. Structural support ensures supervisors have and use the necessary tools and organizational backing to lead from a distance. Readiness for telework reflects the preparedness of organizations, supervisors, and teams for remote operations, which is fundamental to smooth group interactions and guaranteeing success. Monitorization, when implemented appropriately, allows supervisors to maintain oversight without micromanaging, striking a crucial balance in remote settings.

On the demands side, workload, isolation, and information overload represent significant challenges that may trigger a negative view of teleworkers' supervisory performance. The workload often intensifies in remote settings if not properly managed. Isolation can affect supervisors and their teams, necessitating deliberate actions to maintain connection and engagement. Information overload, exacerbated by the reliance on digital communication in telework, demands that supervisors develop digitalized competencies in filtering and prioritizing information effectively. Together, these factors encompass core challenges and opportunities in telework supervision, making them pivotal in understanding and enhancing

supervisor performance in remote work contexts. Therefore, we recognize that the rapid evolution of digital tools and tasks may lead to the emergence of new resources, demands, and novel required competencies (Dollard and Bailey, 2021; González-Anta, 2024).

We will now delve into the six critical resources and demands:

a) *Structural support* encompasses the technological frameworks and organizational policies enabling remote work (Buonomo et al., 2023; Gerich, 2023). It includes not only the technological infrastructure (such as the required software and hardware tools or reliable and seamless internet access) but also policies and practices promoted by the organization that support telework, such as flexible working hours, training for telework, virtual team communication, access to data and systems remotely (Illegems et al., 2001; Kohont and Ignjatović, 2022). Also, it encompasses the endorsement of networks inside the company to connect teleworkers (Bentley et al., 2016), such as virtual communities that may help to exchange knowledge between the distributed members (González-Anta et al., 2021). This support is crucial as it directly impacts the teleworkers' ability to perform tasks efficiently, balance work and personal life, and maintain wellbeing and job satisfaction (Kohont and Ignjatović, 2022; Buonomo et al., 2023). Research has found that structural support is a significant resource for teleworkers according to the Job Demands-Resources (JD-R) model (Illegems et al., 2001). By providing teleworkers with the necessary tools, supervisory support, and flexibility, organizations can help reduce the risks and consequences (e.g., stress and isolation) often associated with remote work (Chambel et al., 2022; Kohont and Ignjatović, 2022). Furthermore, structural support fosters a sense of belonging and commitment to the organization and the perceptions that the worker has of their supervisors, as employees feel valued and supported. In this line, this support closely influences the perceptions of teleworking supervisors (Park and Cho, 2020) on the relevance of telework. Thus, structural support not only enables the practical aspects of teleworking but also contributes to a positive teleworking experience, enhancing the overall effectiveness of remote work arrangements (Bentley et al., 2016; Kohont and Ignjatović, 2022).

b) *Readiness for telework* equips teleworkers with strategies, physical and social adaptations, and mindsets to overcome obstacles and optimize remote work arrangements (Gerich, 2023). This encompasses technological readiness, environmental adjustments, and psychological preparedness to successfully navigate telework complexities (Greer and Payne, 2014). Technological readiness involves ensuring access to necessary tools and secure communication channels. Environmental adjustments pertain to creating a dedicated and ergonomic workspace that fosters concentration and efficiency. Psychological readiness entails developing strategies for self-motivation, time management, and work-life boundaries (Zhao and Higa, 2007; Greer and Payne, 2014). According to the Job Demands-Resources (JD-R) model, such readiness acts as a critical resource for teleworkers, enabling them to do anticipatory actions to balance work demands with their resources, thereby enhancing the wellbeing and productivity of the workers. It will also be closely linked to supervisors' perceptions of telework (Park and Cho, 2020) and role perceptions by teleworkers, as supervisors are responsible for allocating resources, promoting and implementing policies, and providing comprehensive training and support to ensure teleworkers' proficiency in the use of these technologies. This readiness, fostered by supervisors, not only mitigates potential challenges associated with telework but also leverages its benefits, making readiness a cornerstone of effective telework implementation (Zhao and Higa, 2007; Greer and Payne, 2014).

c) *Monitorization:* It refers to electronic tracking activities, communications, and output to align distributed teams (Fairweather, 1999). Methods include basic hardware control such as mouse monitorization to computer-based metrics, remote access inspection, log analysis, web, user activity, and/or endpoint monitorization (Kalischko and Riedl, 2021). This monitoring ensures remote workers remain engaged, productive, and focused despite physical separation (Ravid et al., 2019; Kalischko and Riedl, 2021). Previous literature has found contradictory results on the effect of monitoring teleworkers (Jamal et al., 2021). For example, the Ravid et al. (2022) meta-analysis showed that it can be perceived as a demand that increases stress; however, companies engaging in more open and less invasive monitoring can anticipate more positive perceptions from employees. According to the JD-R model, we suggest that monitoring may act as a vital resource for teleworkers as a tool to provide them with necessary feedback, support, and guidance (Kapustina et al., 2021) that may be less present in a remote working environment. Job demands are defined by their ability to trigger the *health impairment* process. Job resources, on the other hand, do not directly contribute to this process. Instead, they serve as motivational factors. These resources can mitigate the negative effects of job demands on employee strain by fostering the motivation needed to manage these challenges effectively (Bakker et al., 2005). Consequently, with a lack of optimal monitorization, teleworkers cannot regulate their workflow and receive adequate feedback, potentially triggering job demands such as isolation or information overload. In contrast, monitoring in the digital age will be perceived as a resource if it is properly designed to support teleworkers' activity (Demerouti, 2022). It can also improve performance feedback, a derived job Resource (Bakker and Demerouti, 2024). In a similar vein, Dahlstrom (2013) suggests that moderate monitorization helps sustain effort and performance, preventing disengagement over time (Dahlstrom, 2013). In addition, monitorization will benefit teleworkers as it fosters a sense of connection and inclusion with their team and organization, clarifies work expectations, and provides access to resources needed to perform their duties effectively (Fairweather, 1999). Thus, it will help reduce social loafing, which typically becomes a challenge for teleworkers and their teams. In summary, adequate monitorization—i.e., properly introduced and managed by supervisors-may provide clarity, support, and insight necessary for teleworkers to excel despite the distance.

d) *Workload* refers to the volume and intensity of work tasks required of an employee within a given time frame correctly (Hart and Wickens, 1990). It is often conceptualized regarding

the demand it places on an individual's mental and physical resources. Excessive workloads can deplete mental and physical resources, causing stress, emotional exhaustion, and reduced satisfaction, degrading wellbeing and performance (Weinert et al., 2020; Junça Silva et al., 2023). Within telework settings, the workload may imply working unsocial hours and trigger work-home conflict (Camacho and Barrios, 2022; Chambel et al., 2022). It constitutes a pivotal job demand per the JD-R model (Demerouti et al., 2001), especially considering the potential ambiguity and blurring of the personal and working schedules in telework (Chambel et al., 2022). Thus, supervisors' activity will be a key factor in properly organizing and adjusting workloads in telework contexts. Improper management will potentially increase the strain on remote staff (Chambel et al., 2022). Unmoderated workloads may overwhelm teleworkers already facing work-life balance challenges and limited social support (Beckel and Fisher, 2022). This can heighten anxiety, fatigue, and disengagement over time if left unaddressed (Weinert et al., 2020; Junça Silva et al., 2023).

e) *Isolation* refers to a deficiency of meaningful professional interactions and networks -depriving employees of needed social/emotional support, understanding, and connections with colleagues and supervisors-. This engenders feelings of detachment from critical influence channels and contacts, disengagement from the organization, and ultimately communication and performance problems (Golden et al., 2008; González-Navarro et al., 2010). Within the JD-R framework, isolation constitutes a salient psychological job demand. Lack of social interactions and exchanges strains teleworkers, requiring compensatory efforts to cope with it (Golden et al., 2008). Isolation has become more concerned with remote work expansion and is largely studied in virtual working contexts (e.g., González-Navarro et al., 2010; Morrison-Smith and Ruiz, 2020). Telework flexibility can weaken social bonds and physical proximity despite potential productivity gains. The abrupt normalization of telework compels reassessing how employees might uphold professional connections to mitigate perceived exclusion from office culture and dynamics (Golden et al., 2008). The sense of presence and the potential facilitating effects of formal and informal face-to-face work contexts are lost if management is not adapted to the telework environment (Morrison-Smith and Ruiz, 2020).

f) *Information overload* occurs when the volume of data exceeds individuals' processing capacity, hindering decision quality and increasing strain (Eppler and Mengis, 2004; Mungly and Singh, 2012; Schmitt et al., 2021). The proliferation of digital communications (e.g., emails, chats) has heightened overload risks by complicating efforts to effectively discern, integrate, and utilize exponentially expanding information (Mungly and Singh, 2012). Telework has intensified exposure to overloaded digital communications, increasing distraction and cognitive overload risks (Schmitt et al., 2021). Consequently, within the JD-R model, information overload qualifies as a salient psychological job demand for teleworkers. Processing extreme volumes of communications and data sources requires exertion exceeding normal parameters (Camacho and Barrios, 2022). Therefore, information overload may emerge as a key concern for teleworkers that organizations must consciously address through supervisors' management, which is one of the main actors concerning information management in organizations.

1.3 JD-R and supervisors' performance

The availability of job resources and the existing demands may significantly influence teleworkers' assessments of their managers (Kossek et al., 2011). Therefore, establishing a supportive and healthy work environment that prioritizes resources and mitigates demands is vital to nurturing and promoting positive outcomes such as wellbeing (Claes et al., 2023).

Employees with access to ample job resources, such as social support, feedback, autonomy, and opportunities for professional development, are likely to perceive their supervisors more positively. Therefore, supervisors who successfully provide or enhance job resources can be evaluated more positively by their employees (Kossek et al., 2011). The quality and quantity of resources, such as supervisor feedback and communication, also play a crucial role in shaping employees' evaluations. Supervisors who excel in these areas will likely be evaluated more positively as they contribute to a supportive work environment (De Spiegelaere et al., 2016). Accordingly, our first hypothesis is:

Hypothesis 1: Teleworkers' job resources are positively related to supervisors' performance.

Conversely, the presence of high job demands may deplete employees, resulting in negative supervisory assessments, especially considering that, rather than operating in isolation, job demands are interconnected and likely exert compounding effects, as the impacts of one job demand may intensify or amplify the effects of another (Bakker and Demerouti, 2017). In such scenarios, employees could negatively evaluate their supervisors, attributing increased demands, lack of support, and resources to supervisory inadequacy (Golden et al., 2008; Kossek et al., 2011; Chambel et al., 2022). Employees are likely to recognize and value supervisors' efforts to balance job demands, possibly leading to more positive evaluations, and it can be the opposite in case the supervisor cannot manage these demands, affecting their evaluations negatively (Kossek et al., 2011). In consequence, our second hypothesis is:

Hypothesis 2: Teleworker job demands are negatively related to supervisors' performance.

1.4 Satisfaction with telework as a moderator on the relations between job demands and resources with supervisors' performance

Job satisfaction is the extent to which individuals feel content with their job roles, encompassing various factors, including work environment, tasks, compensation, and relationships with colleagues and supervisors. It is a critical aspect of organizational behavior and employee wellbeing (Fonner and Roloff, 2010). Job satisfaction has been profusely analyzed (Meier and Spector, 2015; Judge et al., 2020) to the point that it is considered one of the most studied constructs in organizational psychology (Judge et al., 2017). Lately, it has also been studied in its

relation to telework (Bellmann and Hübler, 2020; Zöllner and Sulíková, 2021; Erro-Garcés et al., 2022). Despite this, it is only recently that literature is deepening into satisfaction with telework (Blahopoulou et al., 2022; Peñarroja, 2023), even though satisfaction with teleworking is a key organizational variable for telework success (Peñarroja, 2023). Satisfaction with telework can vary based on organizational support, information management, or organizational culture, among others, and is related to performance perceptions (Blahopoulou et al., 2022). Satisfaction with telework will also be associated with the demands and resources perceived by the teleworker, as it will correlate with the extent to which teleworkers have experienced the benefits -or difficulties- of remote work arrangements (Peñarroja, 2023). Specifically, satisfaction with telework could act as a moderator between the perception of organizational demands and resources and the evaluation the employee makes of their supervisor because the perceptions of satisfaction can influence how employees interpret and react to their work environment and interactions (Fonner and Roloff, 2010; Kwon and Jeon, 2018).

When employees are satisfied with an area of their jobs -such as telework in our case-they may perceive job demands as more manageable and view the resources provided by their supervisors more positively. Moreover, satisfaction may enhance the gain spirals that resources provide while potentially diminishing the negative effects of job demands and discontinuing the loss spirals (Bakker and Demerouti, 2017). We consider that satisfied teleworkers will appraise their supervisors through a more positive lens, even if the supervisor's behavior or style is not necessarily exceptional. The positive perception enhances their evaluation of supervisors, as they attribute part of their satisfaction to the support and resources provided by their actions (Kwon and Jeon, 2018; Jamal et al., 2021). Conversely, dissatisfied teleworkers might view job demands more critically and feel the resources are insufficient, leading to a less favorable evaluation of their supervisors (Jamal et al., 2021) or bias in their evaluation of the resources and demands related to teleworking and supervision, despite the supervisors' actual performance. Satisfaction with telework, therefore, may serve as a lens through which employees assess their work conditions and supervisor effectiveness. Therefore, we state:

Hypothesis 3: Satisfaction with telework moderates the relationship between JD-R factors and supervisors' performance.

In sum, this study aims to analyze the antecedents, in terms of telework job resources and demands, that predict the supervisors' performance rated by their employees. Additionally, we aim to analyze the role of satisfaction with telework as a moderator. We argue that this variable may have an interaction effect, ultimately influencing the supervisors' performance evaluation.

By doing so, we aim to make several contributions to the literature and professional practice. First, we extend the understanding of the antecedents of supervisors' performance in the context of telework, a rapidly growing work arrangement that presents unique challenges for maintaining effective supervisor-subordinate relationships. Second, by identifying the key antecedents of supervisors' performance rated by employees in telework settings, we provide valuable insights for organizations seeking to optimize remote work arrangements and support positive supervisor-subordinate dynamics. Finally, by analyzing the role of telework satisfaction in the relationship between contextual factors and supervisors' performance, we explore relevant variables that can boost the perception of supervisors by their employees.

2 Methods

2.1 Sample

The sample of this study was composed of 322 Spanish teleworkers from the Valencian Community who completed their supervisors' evaluations. 49.7% of the sample were male and 50.3% female, with a mean age of 44.3 years (SD = 13.9). 22.7% telework daily, 25.2% more than 30% of their working day (approximately more than a day and a half per week), and 52.2% several times a month. Workers with extensive work experience (more than seven years) predominate with 69.3% of the sample. Likewise, most of them perform jobs that require medium or university professional qualifications (48.4%), and 30.7% carry out technical and administrative or sales activities that require medium professional qualifications.

Fieldwork was carried out from April 26 to May 26, 2023. The study was part of a more extensive survey studying digital work and employment in the Valencian Community context, analyzing the magnitude of this phenomenon and different descriptive data. For this purpose, self-administered online surveys using the CAWI (Computer Aided Web Interviewing) method were conducted on online panels. In this type of survey, panelists (respondents) receive a small compensation in return for their participation.

2.2 Measures

While there are existing scales that measure telework supervision (e.g., Kim et al., 2021) and the demands and resources associated with telework (e.g., Sardeshmukh et al., 2012; Pulido-Martos et al., 2021), we used our proper scales for this study in the Spanish language which were also back-translated into English (see Appendix 1), and following the four-anchor Likert arrangement recommendation by Hernández et al. (2001). This decision was made firstly because the existing measures did not adequately address the key aspects identified in our literature review nor consider the actual situation during the lockdown and subsequent telework reality, such as readiness for telework, information overload, and the more social elements of supervision that are important in a telework context post COVID-19 (Peiró and Soler, 2020). By creating specific scales, we can ensure that our measures are well-aligned with the specific constructs we aim to investigate:

Telework Supervisory Performance: A scale of six items has been developed to evaluate supervisors in teleworking contexts. This scale is designed to evaluate non-digital competencies that need to be adequately enacted in a digital context (i.e., digitalized competencies). The instructions were: "*Please rate your supervisor, manager, or person whom you account to in your work on the following aspects of your telework*:" An item example is "*The way s/he sets your goals, tasks, and workload."* The Likert response scale

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TABLE 1 Factor loadings of telework supervisory performance scale (TSP) items.

Items	Factor loading
1. The way s/he sets your goals, tasks, and workload	0.851
2. The support provided by her/him to carry out your work	0.921
3. The way s/he appraises your performance	0.859
4. The relationship and personal dealings with him/her	0.835
5. The way s/he manages team meetings	0.885
6. His/her contribution to create a good job climate	0.883

had four options, from 1 (Low rating) to 4 (High rating). Table 1 presents the factor loadings of each item.

Telework Resources Scale: comprises three factors: structural support (five items), readiness for telework (four items), and monitorization (four items). Table 2 presents the factor loadings of each item.

Structural Support refers to the policies, resources, training, equipment, communication channels, and overall work environment an organization provides to help employees effectively and efficiently achieve their job-related goals and objectives as well as perform their roles safely in a teleworking context (Buonomo et al., 2023). The instructions to answer the questions were as follows: "*Please indicate your degree of agreement or disagreement with each of the following statements:*" An item example is "*I have technical support for connection or computer problems.*" The Likert response scale had four options from 1 (Totally disagree) to 4 (Strongly agree).

Readiness for telework refers to the availability in the organization of advanced technology, equipment, and members' skills to work remotely when telework arrangements and practices are put in place (Gerich, 2023). To answer this factor, the instructions were as follows: "*To what extent is your company prepared in the following aspects for you to be able to telework effectively?*" An item example is "*The organization of the work process or processes to which you contribute with your work activity.*" The Likert response scale had four options from 1 (Nothing or almost nothing) to 4 (Much).

Monitorization refers to using digital technologies to oversee and manage the work and behaviors of employees working remotely (Ravid et al., 2019). It also includes providing information on the monitoring results obtained to the employee, which clarifies the expected results and contributes to team/organizational goals. To answer this factor, the instructions were: "*Please indicate your degree of agreement or disagreement with each of the following statements:*" An item example is "*The company uses technological tools (software) to monitor my work activity during telework.*" The Likert response scale had four options from 1 (Totally disagree) to 4 (Strongly agree).

The telework demands scale comprises three factors: Workload (four items), Isolation (five items), and Information overload (five items). The items are presented in Table 3.

TABLE 2 Composition of factors and factor loadings of the telework resources scale items.

Factor	Items	Factor loading
Structural support		
	1. The company has adequately assessed the occupational risks inherent in my job in telework	0.600
	2. I have received introductory/training courses for telework	0.560
	3. I have technical support for connection or computer problems	0.732
	4. I have adequate ways of communicating with my superiors	0.535
	5. I have adequate ways of communicating with my colleagues	0.566
Readiness for telework		
	1. Necessary technical equipment	0.756
	2. Preparation of colleagues for teleworking	0.840
	3. Preparation of the supervisor, manager, or person accounting for your work, to direct under teleworking conditions	0.880
	4. The organization of the work process or processes to which you contribute with your work activity	0.760
Monitoring		
	1. The company adequately records my working hours during telework (time recording)	0.660
	2. The company uses technological tools (software) to monitor my work activity during telework	0.860
	3. The company has informed me about the use of technological tools to monitor my work activity during telework	0.980
	4. The company informs me about the information obtained from monitoring my work	0.909

Workload refers to how an individual judges the match between their abilities/capacities vs. how much a particular job, task, or goal will demand to do it correctly (Hart and Wickens, 1990); nevertheless, in telework, it is also related to how it generates work-life interference, making it hard to workers to set boundaries and disconnection routines in this context (Beckel and Fisher, 2022). To answer this factor, the instructions were as follows: "*Please indicate your degree of agreement or disagreement with each of the following aspects of teleworking:*" An item example is "*It requires to work*

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TABLE 3 Composition of factors and factor loadings of the telework demands scale items.

Factor	Items	Factor loading
Workload		
	1. It implies an excessive workload	0.701
	2. It requires to work exceeding the usual working hours	0.701
	3. It makes difficult for me to disconnect from work during non-working hours	0.777
	4. It has resulted in confusion for me between work hours and my personal life	0.658
Isolation		
	1. It causes me a lack of social contact with other people	0.658
	2. It impairs the trusting relationship with supervisors and bosses	0.687
	3. It makes professional promotion more difficult or could make it more difficult for me	0.635
	4. It hinders coordination with my colleagues	0.720
	5. It makes contact and relationship with my supervisor, manager, or person accounting for your work more difficult	0.752
Information overload		
	1. I receive work emails	0.732
	2. I receive work calls	0.884
	3. I respond to work emails	0.827
	4. I answer work calls	0.886
	5. I receive text/audio messages from work via applications like WhatsApp, Telegram, etc.	0.628

exceeding the usual working hours." The Likert response scale had four options from 1 (Totally disagree) to 4 (Strongly agree).

Isolation refers to the perception of insufficient integration into critical workplace networks (colleagues, supervisors, and other stakeholders), rendering feelings of disconnectedness from professional and social structures. It stems from a belief that inherent needs for workplace belonging and influence are unmet (Golden et al., 2008). To answer this factor, the instructions were as follows: "*Please indicate your degree of agreement or disagreement with each of the following aspects of teleworking:*" An item example is "*It causes me a lack of social contact with other people.*" The Likert response scale had four options from 1 (Totally disagree) to 4 (Strongly agree).

Information Overload is related to the numerous sources and the increase of information, which can lead to difficulty in its management (Eppler and Mengis, 2004). In the case of telework environments, it includes information exchanged in emails, calls, and messages. To answer this factor, the instructions were as follows: "*Please indicate the frequency at each of the following situations happen.*" An item example is "*I receive text/audio messages from work via applications like WhatsApp, Telegram, etc.*" The Likert response scale had four options from 1 (Almost never or never) to 4 (Almost always or always).

Satisfaction with telework is related to individuals' contentment with their teleworking experience. It comprises overall satisfaction with telework and how telework has impacted job satisfaction (worsened, unchanged, or improved), combining two items: a) *On a scale from 0 to 10, where 0 is "not at all satisfied" and 10 is "very satisfied," what would you say is your level of satisfaction with telework?* And b) *Which of the following statements best describes your situation? (Telework has worsened my job satisfaction/Telework has not changed my job satisfaction/Telework has improved my job satisfaction)* The correlation between the items was adequate ($r = 0.616$; $p < 0.01$), so the aggregation of these two items could be used as a moderator variable. Due to the different response scales, both items were dichotomized. Consequently, the variable formed by the average of these items takes three values: 0 = low satisfaction, 0.5 = medium satisfaction, and = 1 high satisfaction.

2.3 Data analysis

Descriptive and confirmatory factor analyses were performed using Jamovi 2.3.21 (based on R) to test the validity of our measures. Structural equation modeling (SEM) was carried out using MPlus 8 software with Montecarlo integration to test the moderation model. To evaluate the model fit, we included (a) The chi-square (χ^2)-test, which assesses the overall model fit, with a non-significant *p*-value indicating a good fit; (b) Root Mean Square Error of Approximation (RMSEA), (c) Comparative Fit Index (CFI), (d) Tucker-Lewis Index (TLI), and (e) Standardized Root Mean Square Residual (SRMR). Generally, an RMSEA value below 0.08, CFI and TLI values above 0.90, and an SRMR value below 0.08 suggest an acceptable model fit. Finally, the interaction graphs were modeled by running Python code in the Google Collab platform.

3 Results

3.1 Measurement models

3.1.1 Telework supervisory performance

We tested this six-item scale with a one-factor model, which explains 80.08% of the total variance and has high reliability (α =0.950), a good model fit. A Confirmatory Factor Analysis (CFA) confirmed the validity of the one-factor model, showing a good model fit ($x^2 = 36$, p 0.001; RMSEA = 0.0965; CFI = 0.985; TLI = 0.975; SRMR = 0.017). Additionally, and to strengthen the scales' validation process, the same analysis was performed with the sample of the 2022 regional survey conducted on 491 teleworkers (Peiró et al., 2022). The 2022 results also showed high reliability (α = 0.947) and a good model fit ($\chi^2 = 44.6$, $p < 0.001$; RMSEA = 0.101; CFI = 0.983; TLI = 0.972; SRMR = 0.017). As a result, we confirmed that the telework supervisory evaluation scale (TSP) can

be applied to Spanish teleworking contexts. The details of items and their factor loadings are shown in Table 1.

3.1.2 Telework resources and demands

We tested the Telework Resources Scale as a three-model factor, which demonstrated good reliability, with Cronbach's alpha coefficients of 0.752 for Structural Support, 0.918 for Readiness for Telework, and 0.842 for Monitorization. Confirmatory factor analysis (CFA) was conducted to assess the model fit, which indicated an adequate fit ($\chi^2 = 258$, $p < 0.001$; RMSEA = 0.099; CFI = 0.911; TLI = 0.888; SRMR = 0.083). As with the previous scale, an equivalent analysis was performed with the sample of the 2022 regional survey (Peiró et al., 2022). Reliability indexes for Readiness for telework and Monitoring were acceptable ($\alpha = 0.883$; 0.772). Meanwhile, Structural Support was close to acceptable conventional values ($\alpha = 0.668$). The model fit was also below the 2023 sample ($\chi^2 = 376$, $p < 0.001$; RMSEA = 0.115; CFI = 0.834; TLI = 0.792; SRMR = 0.079). Therefore, a unifactorial model was also tested in the current sample, showing significant factor loadings ($p < 0.001$) with values between 0.434 and 0.843. However, the fit indices were less adequate than in the three-factor model [$\chi^2_{(77)} = 711$, $p < 0.001$; CFI = 0.739; TLI = 0.692; RMSEA = 0.160]. The details of items and their factor loadings are shown in Table 2.

We also tested the Telework Demands Scale as a three-factor model, demonstrating good reliability, with Cronbach's alpha coefficients of 0.852 for Workload, 0.862 for Isolation, and 0.890 for Information overload. Confirmatory factor analysis (CFA) was conducted to assess the model fit, which indicated an adequate fit ($\chi^2 = 238$, $p < 0.001$; RMSEA = 0.083; CFI = 0.934; TLI = 0.919; SRMR = 0.046). Regarding telework demands in the 2022 survey (Peiró et al., 2022), all reliability indexes were above acceptable (Workload = 0.851; Isolation = 0.745; Information overload = 0.901). The CFA also indicates a good fit ($\chi^2 = 246$, $p < 0.001$; RMSEA = 0.077; CFI = 0.937; TLI = 0.920; SRMR = 0.043). Despite the above, a unifactorial model was also tested in the current sample, showing significant factor loadings ($p < 0.001$) with values between 0.227 and 0.745. However, the model fit indices were also inadequate [$\chi^2_{(77)} = 1{,}275$, $p < 0.001$; CFI = 0.519; TLI = 0.431; RMSEA = 0.220]. The details of items and their factor loadings are shown in Table 3.

A CFA was conducted using the six-factors model to confirm the separation between resources and demands. The results of the Confirmatory Factor Analysis show that the six-factor model has an acceptable fit ($\chi^2 = 783$, $p = 0.001$; RMSEA = 0.069; CFI = 0.902; TLI = 0.889; SRMR = 0.069). Likewise, the factors associated with demands negatively covaried in the model, and those associated with resources positively covaried, which confirms the theoretical division between factors (details in Table 4).

3.2 Correlations between variables

The correlations between the studied variables (resources, demands, moderators, and supervisor performance) were analyzed as a first approach. Results are shown in Table 4.

All the resources and most of the demands (except information overload) significantly correlate with the evaluation of supervisor performance. The highest correlations are with structural support and readiness for telework, which correlate positively with supervisor performance. On the contrary, workload and isolation correlate negatively with this outcome. Satisfaction with telework correlates positively with supervisor performance.

Strong positive relationships were found between the three resource factors: Readiness for telework, structural Support, and monitorization. The highest correlation was between Structural Support and Readiness for telework ($r = 0.695$, $p < 0.001$). These results indicate that providing various resources related to training, equipment, IT support, and work monitorization tends to coincide with resources in the context of telework.

Regarding demands, workload correlated most strongly with isolation ($r = 0.631$, $p < 0.001$), suggesting that higher job demands are associated with greater feelings of isolation for teleworkers. Information Overload had minor to moderate correlations with the other demand factors. As expected, the resource factors tend to correlate negatively with the demand factors. For example, greater readiness for telework is associated with lower workload and isolation. This fits with the idea that more resources can reduce demands. In terms of satisfaction with telework, this variable was positively correlated with resource factors and negatively correlated with demand factors.

Overall, the pattern of relationships provides good preliminary support for the study model, suggesting that resources can buffer demands and strain for teleworkers. Resources also relate positively, while demands relate negatively, to relevant telework outcomes like satisfaction and supervisor evaluations.

3.3 Structural equation modeling

For testing our hypothesis, an SEM was conducted using the six factors (demands and resources) with Satisfaction with Telework as a moderator. This model explains 55.9% of the variance in the evaluation of supervisor performance ($r^2 = 0.559$, $p < 0.001$). Details are shown in Figure 1.

Regarding our first hypothesis, the direct effects of the three resource factors showed that structural support ($\beta = 1.475$, $p = 0.021$) has a significant and positive effect on supervisor performance. In turn, readiness for telework has no direct effect ($\beta = 0.069$, $p = 0.718$), and monitorization has a negative effect ($\beta = -0.833$, $p = 0.049$). As a result, our first hypothesis is partially supported.

In the case of our second hypothesis, the three demands studied (workload, isolation, and information overload) had no significant effect on the supervisors' evaluation. Therefore, this hypothesis is rejected.

In the case of our third hypothesis -examining the interaction effects between satisfaction with telework and the predictor variables- there were significant interaction effects between the three resources and satisfaction with telework. Structural support and monitoring show significant negative interactions with satisfaction with telework ($\beta = -0.861$, $p < 0.001$; $\beta = -0.349$, $p =$

TABLE 4 Means, standard deviations, and correlation matrix between the study variables.

Mean		SD	Structural support	Readiness for telework	Monitorization	Workload	Isolation	Information overload	Satisfaction with telework	Evaluation of supervisor performance
Structural support	2.83 (range 1–4)	0.683	—							
Readiness for telework	2.78 (range 1–4)	0.844	0.695***	—						
Monitorization	2.47 (range 1–4)	1.00	0.561***	0.496***	—					
Workload	1.85 (range 1–4)	0.769	−0.216***	−0.195***	−0.172**	—				
Isolation	1.88 (range 1–4)	0.742	−0.198***	−0.200***	−0.072	0.631***	—			
Information overload	2.27 (range 1–4)	0.842	−0.025	−0.082	−0.121*	0.285***	0.099	—		
Satisfaction with telework	0.575 (range 0–1)	0.417	0.311	0.311***	0.192***	−0.341***	−0.302***	−0.158**	—	
Evaluation of supervisor performance	3.04 (range 1–4)	0.847	0.490***	0.490***	0.355***	−0.210***	−0.184***	−0.027	0.255***	____

*p < 0.05.
**p < −01.
***p < 0.001.

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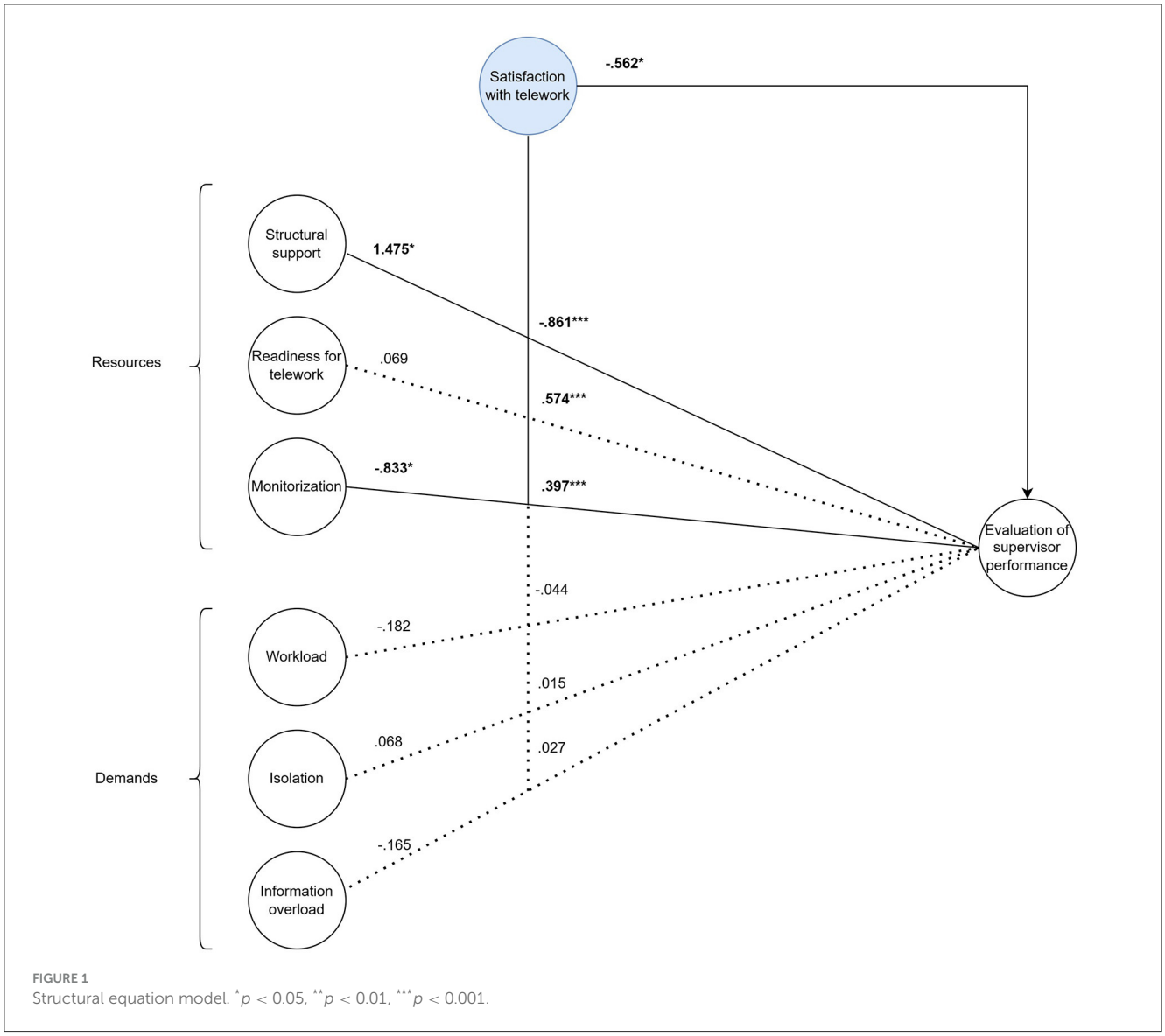

FIGURE 1
Structural equation model. $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

0.015); on the opposite, the interaction with readiness for telework is positive ($\beta = 0.387$, $p = 0.005$), suggesting that at higher levels of satisfaction with telework, low and medium levels of readiness can reach higher levels of evaluation (details in Figure 2). No significant interactions were found for demands (workload, isolation, and information overload). Therefore, the moderation hypothesis is accepted only for resources included in the model. Also, the direct effect of satisfaction with telework is significant and negative ($\beta = -0.562$, $p = 0.031$).

Given that the direct effects of structural support and monitorization occur in the inverse direction of the moderated effects of satisfaction with telework, we tested the possibility that the moderated relationship would be curvilinear. By contrasting the original moderation with the quadratic moderation, the analysis shows significant curvilinear relationships for both variables. In the case of structural support, at low values of this variable, satisfaction with telework does not affect the supervision evaluation. However, as satisfaction increases (passing the threshold of ~0.5), it boosts a positive effect (details in Figure 3).

Something similar occurs in the case of monitorization, in the opposite direction: Although satisfaction is high at higher levels of monitorization, it does not have any positive effect on the evaluation of supervision. High levels of supervisor performance evaluation are only reached at low levels of monitorization, despite the levels of satisfaction (details in Figure 4).

Finally, in the case of the direct relationship between satisfaction with telework and the evaluation of supervision, the relationship is also curvilinear, showing that, at low levels of satisfaction, the evaluation of supervision is also low. However, medium satisfaction levels amplify this outcome (details in Figure 5).

4 Discussion

The present study analyzed the relations of job resources and demands as antecedents of the employees' evaluation of

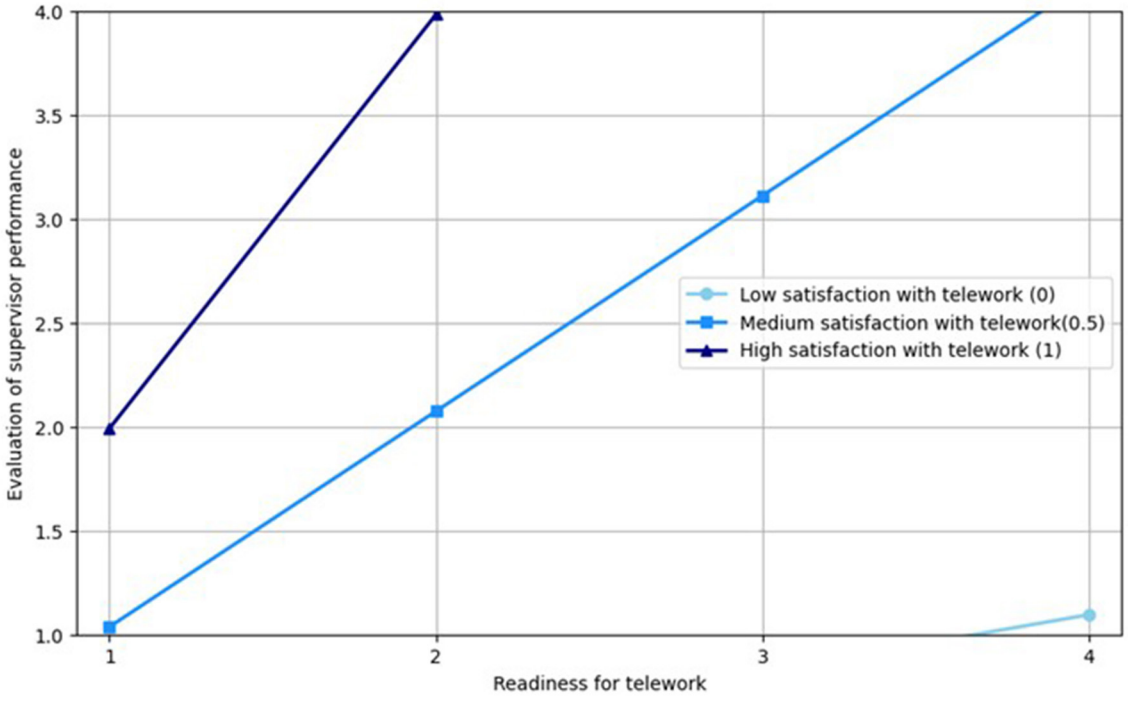

FIGURE 2
Moderating effect of satisfaction with telework in the relationship between readiness for telework and evaluation of supervisor performance (adjusted to starting point = 1).

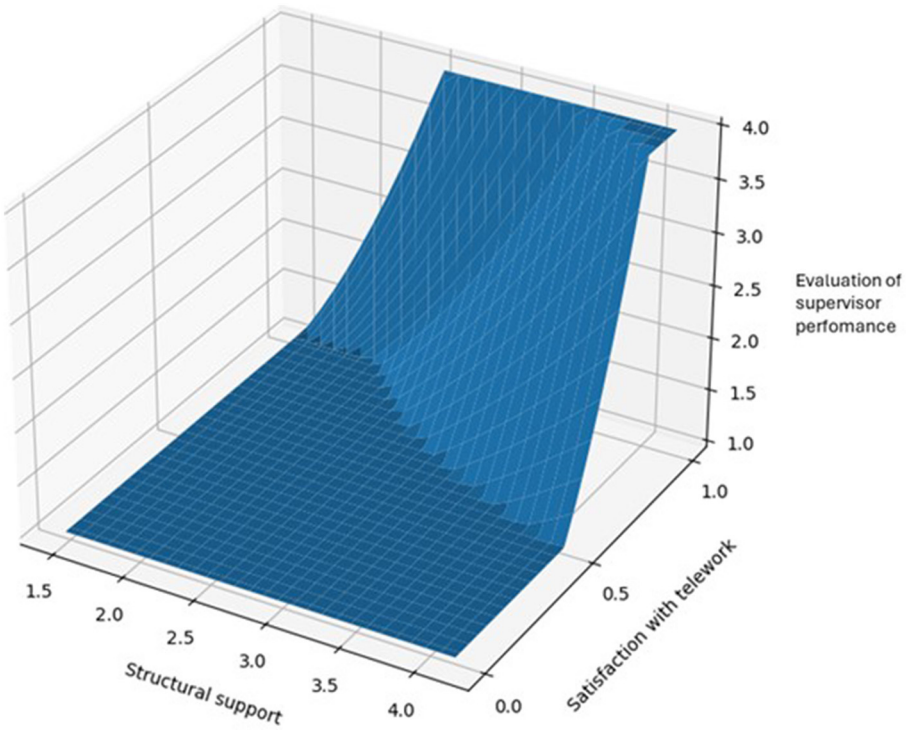

FIGURE 3
Moderating effect of satisfaction with telework in the relationship between structural support and evaluation of supervisor performance. Satisfaction with telework values between 0.5 and 1 were projected continuously for better visualization of the graph.

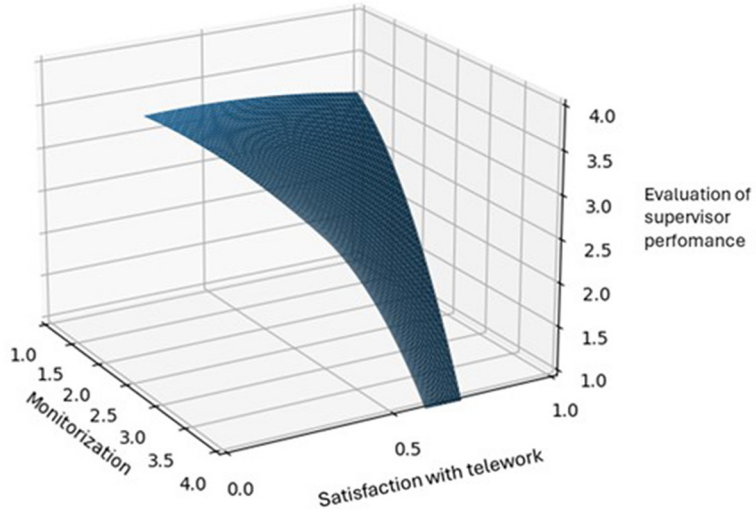

FIGURE 4
Moderating effect of satisfaction with telework in the relationship between monitorization and evaluation of supervisor performance. Satisfaction with telework values between 0, 0.5, and 1 were projected continuously for better visualization of the graph.

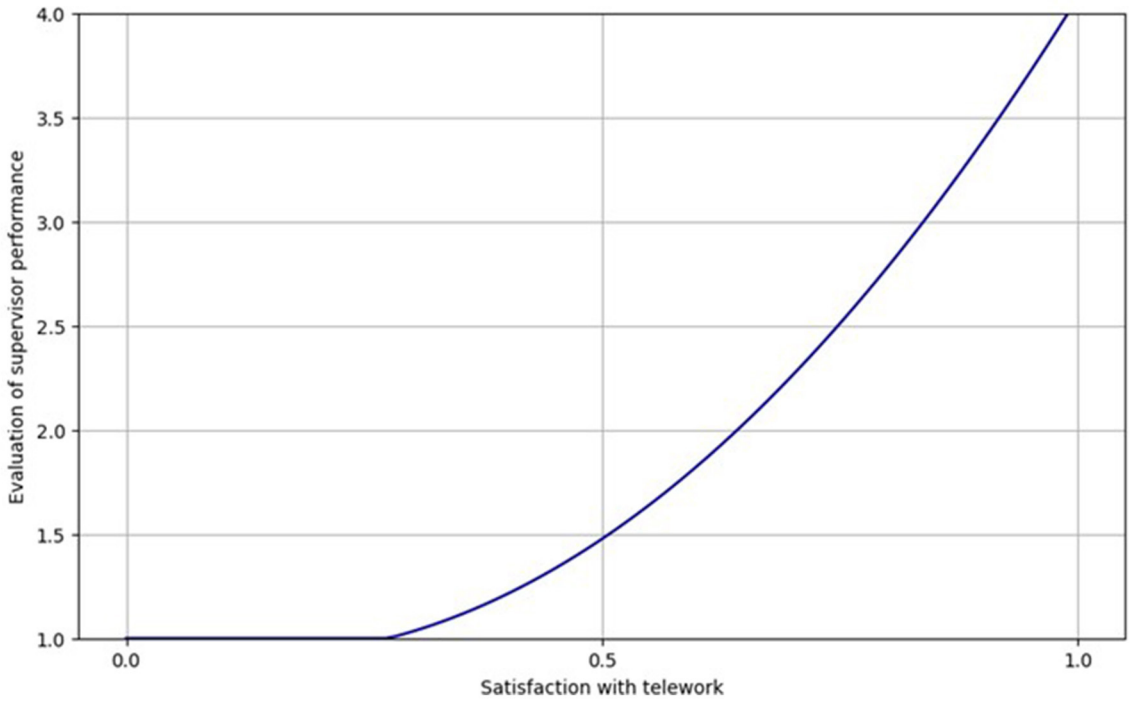

FIGURE 5
Curvilinear relationship between satisfaction with telework and evaluation of supervisor performance. Satisfaction with telework values between 0, 0.5, and 1 were projected continuously for better visualization of the graph.

their supervisors' performance in telework contexts, considering the moderating role of telework satisfaction in this relationship. Toward this end, we developed, tested, and applied a reliable and valid questionnaire for evaluating supervisors' performance rated by their subordinates who telework. Several findings emerged that can guide future research and practice on the best factors to achieve a favorable evaluation of teleworkers' supervisor performance.

First, building on the JD-R model (Demerouti et al., 2001), our results highlight the vital role organizational structural support plays in shaping employees' perceptions of supervision effectiveness when working remotely. Although prior literature has studied the relationship between job demands, resources, and the performance of supervisors in telework (e.g., Gajendran et al., 2014; Van Steenbergen et al., 2017), most of these studies were conducted

before the COVID-19 pandemic. In the post-pandemic era, our results showed that ongoing structural support significantly predicts supervisor evaluations. This aligns with previous research emphasizing that resources such as training, equipment, support at different levels of communication channels, and flexibility policies enable employees to perform productively and feel valued by their organization (Bentley et al., 2016; González-Anta et al., 2020; Buonomo et al., 2023). When organizations invest in facilitating telework -i.e., increasing motivation and engagement through the provision of resources- employees likely recognize their supervisor's performance. In addition, this generates a boosting effect in employees with medium and high satisfaction levels, pointing to a positive interaction between these variables.

Second, our findings indicate that medium and highly satisfied teleworkers significantly benefit from organizational investments in telework preparation. There was a significant positive interaction between satisfaction and readiness, suggesting that satisfied teleworkers are particularly attuned to organizational readiness efforts. This satisfaction may predispose them to evaluate supervisors more positively when proper knowledge and skills are developed for remote work.

Third, we found a curvilinear interaction between satisfaction and structural support in predicting supervisor evaluations. A potential explanation is that highly satisfied teleworkers have less need to rely on ongoing formal structural backups when they feel satisfied with telework. Consequently, they may put less weight on structural support when appraising their supervisors. Conversely, less satisfied staff likely depend more on explicit and robust communication channels, protocolized telework processes, and technical assistance, increasing the relevance of structural support to their supervision perceptions.

Fourth, our results did not support the hypothesized positive relationship between monitoring and supervisors' evaluation by their subordinates. As noted in the introduction, contradictory findings have been found in prior research on monitorization (Kalischko and Riedl, 2021). Moreover, we also highlighted that there are no fixed resources or demands (Bakker and Demerouti, 2024). Thus, it could be possible that negative personal or social views about the influence of monitorization could make it a threat rather than an asset for teleworkers. In addition, our results also show that monitoring remote employees' work activities correlates with supervisor evaluations moderated by telework satisfaction. Specifically, high levels of employee monitorization can reduce the evaluation of their supervisors in less satisfied employees. This aligns with prior arguments that over-control could be non-beneficial for the perception of supervisory performance, eliciting distrust or micromanagement perceptions that compete with its positive effects (Fairweather, 1999).

Fifth, all three job demands studied (workload, isolation, and information overload) showed no significant link to supervisor assessments, despite extensive research on their detrimental impacts on employees' telework experiences (e.g., Golden et al., 2008; Bentley et al., 2016; Charalampous et al., 2018; Beckel and Fisher, 2022). A potential reason for these unexpected results is that employees could perceive these demands as fixed conditions of teleworking, not relating them directly to supervisors' behavior. Technology for telework -depending on how it is implemented- intrinsically introduces complexities around boundaries, social connectivity, and digital burdens, increasing demands, at least in the short term (Demerouti, 2022). When technology is implemented following technological determinism, employees may attribute it to the organizations' top management, not supervisors. Employees may view such struggles as inevitable tradeoffs rather than failures of supervision. This possibility highlights the need for further research on how employees contextualize telework challenges and whether they relate them to their perceptions of supervision (Peiró et al., 2023a).

Sixth, another finding is the curvilinear relationship between employees' satisfaction with telework and their evaluation of the supervisor's performance. It is possible that at low levels of satisfaction with telework, employees may struggle with the challenges of remote work, such as reduced communication and collaboration, leading to lower supervisor evaluations (Gajendran and Harrison, 2007). As satisfaction with telework improves to moderate levels, employees may find a better balance between the benefits and drawbacks of remote work, resulting in a slight improvement in supervisor ratings. This finding highlights the need to ensure teleworkers' satisfaction with telework to have a good evaluation of the performance of their supervisors.

Finally, a valuable contribution of this study was the elaboration and initial validation of three scales: one, a brief measure specifically tailored to assess supervisory behaviors in telework contexts from subordinates' perspectives -the Telework Supervision Performance (TSP) scale-; second, a telework resources scale; and third, a telework demands scale. The scales demonstrated internal solid reliability and model fit as a one-factor tool, confirming their cohesiveness and validity in capturing key managerial digitalized competencies around remote supervision. The results have also been confirmed in a cross-sampling check. However, further research is required to continue validating these scales as an ongoing process, as DeVellis (2021) stated. This Spanish language version establishes its potential transferability for broader utilization across geographic contexts and offers a simple and clear tool for advancing research and organizational assessment around the intricacies of supervising remote workers.

4.1 Practical implications

Our findings have several practical implications for organizations and supervisors managing remote employees. First, due to the relevance of structural support in supervisors' evaluation, it is essential to establish and maintain robust structural support systems, including specific training when required, technical help, virtual team communication channels, and occupational health protections relevant to remote environments. In brief, specific policies and practices must be arranged that properly prepare employees for telework. Our results show that this will be closely linked to adequate supervisors' performance rated by their teleworkers.

Second, organizations aiming to implement telework must understand the crucial role of satisfaction with teleworking in moderating the impact of job demands and resources. As noted previously, job demands and resources vary among contexts, and

their effects are also determined by personal features (Bakker and Demerouti, 2017, 2024). In consequence, HR departments and managers must recognize that the effectiveness of support measures may vary based on employee satisfaction levels. For instance, organizations must provide sufficient base conditions to teleworkers to ensure an adequate level of satisfaction among them. In this way, they can ensure that those workers who are satisfied with their telework experience receive these efforts more positively. Consequently, a positive feedback spiral can be initiated if a worker perceives the readiness for telework of the organization and is highly satisfied with the arrangement, potentially influencing the positive evaluations of their supervisors.

Third, and related to the previous implication, our results imply that organizations should regularly assess teleworkers' satisfaction and allocate resources according to their needs. This can also lead to flexible telework arrangements tailored to preferences and needs, as telework satisfaction levels vary among employees, influencing their wellbeing and performance (Blahopoulou et al., 2022). Nevertheless, while structural support is important, highly satisfied teleworkers may rely less on formal support systems; therefore, organizations should foster peer-to-peer support networks and informal networks to complement formal structures.

Fourth, organizations must be cautious about the impact of monitorization. As demonstrated in our findings, high monitoring levels can negatively affect supervisors' evaluations, even for employees with good or high satisfaction levels. Therefore, monitorization should be non-invasive and tailored to specific situations or people to minimize its potential negative impact on supervisory performance. Moreover, an adequate trust environment should be fostered before monitorization is implemented and maintained through time, instead of increasing the levels of monitorization when switching to a remote arrangement.

Finally, considering the role of digitalized competencies (traditional competencies adapted for digital contexts, Peiró and Martínez-Tur, 2022), it is crucial to encourage organizations to evaluate supervisors' competencies and provide adequate preparation for adapting their knowledge and skills to the virtual context. Investing in comprehensive tools and training will be critical to promote adequate supervisory behaviors and smooth the transition to telework arrangements while maintaining a full or hybrid remote work culture. At this point, it is crucial to train them in digitalized competencies for supervising in this new environment (Peiró and Martínez-Tur, 2022). Proactively upskilling supervisors on best practices, mindsets, and work strategies (like ways to improve virtual communication or use new AI tools) as well as the new technologies that can enable the work helps in smoothing the common inconveniences of telework arrangements and get them ready to operate in a changing environment (González-Anta, 2024). It also signals supervisors' commitment to promoting a healthier work environment that could produce positive employee reactions.

4.2 Limitations and future research

While this study provides valuable insights, certain limitations should be noted. First, the cross-sectional design with self-reported data captures employee subjective perceptions at only one time point. Longitudinal tracking could elucidate how relationships between JD-R and supervisors' evaluations evolve across telework implementation and stabilization stages and confirm the causal effects between demands, resources, and supervisors' performance.

Additionally, our sample may be biased as all teleworkers were specifically from a region of Spain. As recently highlighted in telework studies, cross-country research can help to clarify, contextualize, and extend the findings, particularly concerning non-significant results such as the preference for telework (Peñarroja, 2023).

Moreover, while we examined a moderating effect of satisfaction, additional boundary conditions like tenure in role or team telework composition may influence findings. We neither control for the organizational context of the participants -e.g., size and sector- which may influence both the demands and resources that telework implies. Additional testing contingency effects and controlling for sample variability will clarify specifically when and for whom certain variables most impact leadership evaluations.

Finally, although we have proposed and validated our telework supervision, demands, and resources scales, including results for the 2023 and 2022 surveys, they need further validation procedures (i.e., convergent, divergent, and predictive validation) as an ongoing process (DeVellis, 2021). Nevertheless, the availability of these metrics is valuable, as they provide comprehensive measures specifically tailored to the current situation, particularly now that hybrid work arrangements are being introduced in the workplace.

5 Conclusions

Our study showed that job resources regarding organizational telework readiness and support consistently predict favorable supervisor evaluations, particularly from satisfied remote employees. Moreover, our findings highlight the importance of organizational factors in employees' perception of supervisors' performance. This study expands on prior literature by analyzing supervisors' performance from the supervised teleworkers' perspective. This perspective is primarily omitted despite leaders' and supervisors' essential role in successful telework. Additionally, we provide researchers and practitioners with easy-to-use and effective tools for feedback about supervision by the employees in a telework context. Particularly, the TSP scale can help to measure telework-supervision 'digitalized' competencies, an emerging topic (Peiró and Martínez-Tur, 2022) of primary importance as more and more job processes and structures become virtual. In conclusion, this study highlights the benefits organizations can have by investing in resources and support to enable managers to lead their teams remotely effectively.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical approval was not required for the studies involving humans because the study was conducted according to the principles expressed in the Helsinki Declaration. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

JP: Conceptualization, Validation, Funding acquisition, Investigation, Project administration, Resources, Supervision, Writing – review & editing. FB-D: Conceptualization, Formal analysis, Methodology, Validation, Writing – original draft, Data curation, Software, Visualization. BG-A: Conceptualization, Investigation, Supervision, Validation, Writing – review & editing, Formal analysis, Methodology, Writing – original draft. AT-S: Funding acquisition, Investigation, Project administration, Resources, Validation, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

The author(s) declared that they were an editorial board member of Frontiers, at the time of submission. This had no impact on the peer review process and the final decision.

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Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/forgp.2024.1430812/full#supplementary-material

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