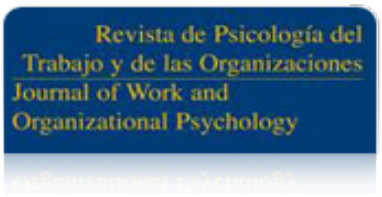

Revista de Psicología del Trabajo y de las Organizaciones
ISSN: 1576-5962
ISSN: 2174-0534
Colegio Oficial de la Psicología de Madrid

Miglioretti, Massimo; Gragnano, Andrea; Margheritti, Simona; Picco, Eleonora
Not All Telework is Valuable
Revista de Psicología del Trabajo y de las Organizaciones, vol. 37, no. 1, 2021, pp. 11-19
Colegio Oficial de la Psicología de Madrid

DOI: https://doi.org/10.5093/jwop2021a6

Journal of Work and Organizational Psychology (2021) 37(1) 11-19

Journal of Work and Organizational Psychology

https://journals.copmadrid.org/jwop

Not All Telework is Valuable

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ARTICLE INFO

Article history:
Received 10 September 2020
Accepted 2 February 2021

Keywords:
Telework
Questionnaire
Wellbeing
Employees
JD-R model

ABSTRACT

Prior to COVID-19, telework was a key action adopted by companies to foster employee wellbeing, but the evidence of its effects was equivocal. This study aims to 1) develop and validate a questionnaire measuring the quality of telework (QoT-q) and 2) assess the impact of telework on employee work engagement and work-family balance in the case of high-quality telework (HqT), low-quality telework (LqT), and no telework (NoT). The sample consists of 260 workers from three Italian organizations. Through principal component analysis and Cronbach's alpha values, the final QoT-q comprised three areas: 1) agile workplaces, 2) flexible worker, and 3) virtual leadership. ANOVAs showed that job resources, work engagement, and work-family balance are significantly higher among HqT, while job demands do not differ or were lower. The Job Demands-Resources model was useful to explain the effects of telework. Implications for future research and practice are presented.

No todo teletrabajo es valioso

Palabras clave:
Teletrabajo
Cuestionario
Bienestar
Empleados
Modelo JD-R

RESUMEN

Antes del COVID-19, el teletrabajo era una de las principales medidas que adoptaban las empresas para fomentar el bienestar de los empleados, pero la evidencia de sus efectos era dudosa. Este estudio tiene como objetivo 1) desarrollar y validar un cuestionario que mide la calidad del teletrabajo (QoT-q) y 2) evaluar el impacto del teletrabajo en el compromiso laboral de los empleados y el equilibrio trabajo-familia en el caso del teletrabajo de alta calidad (HqT), teletrabajo de baja calidad (LqT) y ningún teletrabajo (NoT). La muestra está formada por 260 trabajadores de tres organizaciones italianas. A través del análisis de componentes principales y los valores alfa de Cronbach, la QoT-q final comprendía tres áreas: 1) lugares de trabajo ágiles, 2) trabajador flexible y 3) liderazgo virtual. Los ANOVA mostraron que los recursos laborales, el compromiso laboral y el equilibrio entre el trabajo y la familia son significativamente más altos entre HqT, mientras que las demandas laborales no difieren o son más bajas. El modelo demandas-recursos del puesto de trabajo ha sido útil para explicar los efectos del teletrabajo. Se presentan las implicaciones para la investigación y la práctica futura.

Telework, referring to work performed or organized by means of new information and communication technologies (ICTs) from inside or outside an employer's premises, has become increasingly popular among organizations (Allen et al., 2015; Messenger, 2019). Its incidence is related to the degree of technological development in diverse countries, while its adoption is connected to cultures of work and economic structure (Eurofound, 2017). As a result, across countries, its diffusion varies from 20 and 16 per cent of all employees in the workforce in the United States and Japan, respectively, to only 2 per cent in Argentina (Messenger, 2019).

In European countries, the degree of diffusion prior to the COVID-19 pandemic varied along with the content of the rules framed by governments and social partners (Mazzucchelli, 2017). However, a comprehensive agreement, the European Framework Agreement on Telework (ETUC-UNICE-UEAPME-CEEP, 2002), has provided a general framework covering different practices in EU member states. Across European countries—although there is extensive variation across members, ranging from 18 per cent in Denmark to 2 per cent in Italy—telework is regularly performed by 8 per cent of all employees in the workforce (Messenger, 2019).

In Italy, Law No. 81, enacted on 22 May 2017, has recently encouraged the widespread adoption of telework among large companies (58 per cent), SMEs (12 per cent), and public administrations (16 per cent). This law provided a broad framework for telework, setting no limits in terms of location or time, within the limits of the total duration of daily and weekly working hours (Iudicone, 2017).

On the one hand, companies face current socioeconomic and environmental changes, improving their performance and

Cite this article as: Miglioretti, M., Gragnano, A., Margheritti, S., & Picco, E. (2021). Not all telework is valuable. *Journal of Work and Organizational Psychology., 37*(1), 11-19. https://doi.org/10.5093/jwop2021a6

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responding to changes in demand to maintain their competitiveness (Mazzucchelli, 2017). On the other hand, employees ask that their sustainable employability and work-family balance be addressed (Mazzucchelli, 2017; Hazelzet et al., 2019). Telework has the potential to meet these needs, saving costs and space and providing less tangible benefits, such as improved work-life balance, a better office environment, and augmented staff attraction and satisfaction (Oseland & Webber, 2012). In the times of COVID-19 crisis, encouragement of flexible working arrangements (e.g., telework or working from home) has been a critical global action adopted by governments and companies to protect workers in the workplace and to maintain economic and educational system activities throughout the quarantine (International Labour Organization [ILO, 2020]).

Alongside the many benefits that lead to organizations implementing telework, the methods of carrying out such adoption range. There is indeed a large variability in companies adopting telework: from arrangements in which employees have some discretion to choose a place of work or the timing and number of their working hours (De Menezes & Kelliher, 2011) to ways of working based on holistic approaches to work style, intersecting the behavioural environment (e.g., activity-based working) (Engelen et al., 2019), from comprehensive "family-friendly" policies (De Menezes & Kelliher, 2011) to profound transformations in organizational practices and culture (Donadio, 2018).

Despite an abundance of grey literature on telework (see Hr Magazine, Sloan Management Review, or People Management), scientific studies addressing the topic and collecting evidence on the effects of telework are few and have some limitations. A review focused on working environments has identified that the typical workspaces adopted for telework facilitate communication and interaction in the workplace, are appreciated by workers, and increase their perceived control of time and space (Engelen et al., 2019). Privacy aspects have been reported to be improved through telework workspaces (Keeling et al., 2015). The effects on health outcomes were negative or equivocal when interventions were forms of contractual flexibility (e.g., involuntary part-time work and gradual retirement), motivated by organizational returns. The effects on the same outcomes were instead positive when interventions were framed as flexible working practices aimed at increasing employees' options for scheduling or overtime (Joyce et al., 2010). However, robust evidence of the effectiveness of telework on physical, mental, and general health and wellbeing was not found (De Menezes & Kelliher, 2011; Engelen et al., 2019; Joyce et al., 2010). Moreover, the evidence of a positive effect of telework on performance-related outcomes (i.e., organizational and individual performance and organizational commitment) is still equivocal (De Menezes & Kelliher, 2011; Omondi & K'Obonyo, 2018). The majority of previous studies focused on specific perspectives, units of analysis, or single practices related to telework, which mainly resulted in low or no effect on the considered outcomes (De Menezes & Kelliher, 2011; Peters et al., 2014). The synergic effect of practices across different organizational areas has not yet been examined (De Menezes & Kelliher, 2011). Therefore, more comparable and generalizable research on telework addressing the impact of a set of work practices on employee outcomes is needed (Engelen et al., 2019; Omondi & K'Obonyo, 2018; Peters et al., 2014).

This study is innovative in several ways. First, this study builds on a comprehensive framework for telework. In the literature, a range of terms and concepts related to various single measures of telework has been used (Allen et al., 2015; De Menezes & Kelliher, 2011). Here, we refer to telework as a new way of organizing work within companies resulting from ICT application in work organizations (Neri, 2017). From our viewpoint, telework should address at least three core components: 1) an agile workplace, referring to the availability of a great variety of workstation settings (informal meeting rooms, collaborative spaces, shared desk spaces, break rooms, and relaxation areas) (Keeling et al., 2015); 2) flexible workers, who should have enough autonomy and flexibility to manage their work schedules and to decide where to work (Omondi & K'Obonyo, 2018); and 3) virtual leadership, concerning management practices strictly related to the "management by objectives" approach, according to which telecommuters' goals have to be clearly set and leaders should trust, engage, and empower employees rather than incentivizing or controlling them (Kreitner & Kinicki, 2013).

Second, by constructing the proposed framework for telework, we aim to develop a questionnaire on the quality of telework (QoT-q). In doing so, we will address another relevant limitation of previous studies, which did not distinguish between managers' intentions to implement telework practices and employees' perceptions of those same practices (Peters et al., 2014), since an implemented telework that truly aligns employees' ideas will probably be more effective, giving a voice to employees is of high priority. Therefore, an instrument measuring the quality of telework, as perceived by employees, is needed.

Third, we argue that the effectiveness of telework on employee outcomes cannot be assessed by means of a single measure but only in light of a general model for telework, which includes most of the elements involved in organizational processes. We also argue that the potential effectiveness of telework on employee outcomes will be the result of the synergic effect of different organizational practices on the considered outcomes, instead of the impact of a single practice. Thus, telework implemented in light of a comprehensive framework can be regarded as high-quality telework (HqT), as it has the potential to be more effective in leading to positive employee outcomes (work engagement and work-family balance). In contrast, implemented telework that does not address this perspective can be framed as low-quality telework (LqT) since it has the potential to be less effective in leading to positive employee outcomes (work engagement and work-family balance) or in being indistinguishable, in terms of employee outcomes, compared to traditional work (NoT).

Therefore, our study goals are to develop and validate the quality of telework questionnaire (QoT-q), a new instrument based on a proposed multifaceted model of telework, and to assess the impact of telework on employee work engagement and work-family balance in the case of high-quality telework (HqT), low-quality telework (LqT), and no telework (NoT).

Theoretical Background

The job demands-resources model (JD-R model) (Bakker & Demerouti, 2007) provides us with a framework to explain how telework has an impact on employee wellbeing (Peters et al., 2014). According to the model, two different processes lead to work-related stress and motivation (Bakker & Demerouti, 2007). The first is the health-impairment process, in which high job demands (e.g., mental and physical workload) consume physical and psychological energy resources, leading to employee exhaustion and health issues (Demerouti et al., 2001). However, in this process, appropriate job resources (autonomy, coworker support, etc.) may mitigate adverse effects of job demands (Bakker & Demerouti, 2007). The second process is the motivation process, in which a large amount of job resources contribute to stimulating positive job outcomes, such as work engagement (Bakker & Demerouti, 2007).

Due to its characteristics (e.g., job autonomy and working by projects), telework can be considered as creating relevant job resources at both the interpersonal and job levels (Peters et al., 2014). The modification of the existing balance between job resources and job demands towards a condition with significant opportunities in terms of discretion, judgement, and other relevant resources to cope with (high) job demands can lead to an "active job" (Karasek Jr., 1979). This situation may have a positive influence on employee wellbeing (Peters et al., 2014).

Telework Fosters Job Resources

As telework is expected to provide a high level of employee autonomy—in selecting the appropriate time and place to work (Van Steenbergen et al., 2018) and in the augmented responsibility for employee goals achievement (Kreitner & Kinicki, 2013)—and to lead to better communication among employees, improved by the adoption of agile workspaces (Engelen et al., 2019), we hypothesize that with reference to the JD-R model (Bakker & Demerouti, 2007) job resources (job control, quality of relations and supports) will be significantly increased but only among Hq telecommuters. Therefore, that the following hypothesis is proposed:

*H*1: Job resources (job control, quality of relations, and support) will be increased among Hq telecommuters but not among Lq telecommuters and traditional workers.

Telework Does not Modify Job Demands

Telework changes the way of organizing and thinking about work (Neri, 2017) rather than job content or role. Telework should also enhance supportive working conditions (Peters et al., 2014), enabling significant job resources to cope with demands. For these reasons, we hypothesize that job demands will not vary among Hq telecommuters compared to Lq telecommuters and traditional workers. Thus, with regard to the JD-R model (Bakker & Demerouti, 2007), we predict that the following:

*H*2a: Job demands will not be higher or lower among Hq telecommuters than among Lq telecommuters and traditional workers.

Moreover, with regard to job demands, off-work hours' technology and its intrusion must be considered (Ghislieri et al., 2017). It has been reported that technology intrusion in employees' private life may be a stressor; it may prevent employee recovery and increase work-life conflicts (Derks & Bakker, 2014; Derks et al., 2015; Ghislieri et al., 2017). Conversely, few studies have reported that smartphone use can have a positive impact on employee work-life balance, especially if associated with working time flexibility (Ghislieri et al., 2017; Wajcman et al., 2008). We therefore hypothesize that despite the greater use of technology among Hq telecommuters, technology intrusion will not be higher in this group of workers. Thus, our hypothesis is as follows:

*H*2b: Technology intrusion will not be higher among Hq telecommuters than among Lq telecommuters and traditional workers.

The Effect of Telework on Work Engagement

Work engagement was found to be positively affected by telework (Gerards et al., 2018; Peters et al., 2014). However, more generalizable findings are needed, and diverse phases of implemented telework must be specifically considered (Gerards et al., 2018; Peters et al., 2014). We hypothesize that in line with the findings of Peters et al. (2014) and Gerards et al. (2018), telework has an effect on Hq telecommuters' work engagement, as it increases employee autonomy, which can be thought of both as a motivator and a buffer for dealing with job demands. Therefore, our hypothesis is as follows:

*H*3: Work engagement will be higher among Hq telecommuters than among Lq telecommuters and traditional workers.

The Effect of Telework on Work-Family Balance

Related to work-life balance issues, the interface between resources and demands from work or family domain and personal behaviours within these domains must be considered (Bakker et al., 2011). The more a person has control over deciding where and when he/she works, the higher the work-family effectiveness should be (Kossek et al., 2006). This will correlate with lower stress (Thomas et al., 1995) and lower work-family conflict because it allows for work and family demands to be reorganized autonomously (Kossek et al., 2006). Therefore, due to an increase in job resources like control and autonomy (*H*1), Hq telecommuting should result in an improved work-family balance among telecommuters. Thus, we predict the following:

*H*4: Work-family balance will be higher among Hq telecommuters than among Lq telecommuters and traditional workers.

Table 1. Descriptive Statistics of the Total Sample (*N* = 260)

Variable	%	*N*
Mean age (*SD*)	43	(11)
Gender		260
Female	58%	150
Number of children		260
None	48%	126
One or more	52%	134
Number of children under 12 years		257
None	74%	189
One or more	26%	68
Elderly caregiver		260
No	77%	201
Yes	23%	59
Job role		259
Entrepreneur	4%	9
Manager	2%	5
Supervisor	15%	39
White-collar	75%	195
Other	4%	11
Working hours		258
Full-time	85%	219
Company size		252
Big (250+ employees)	72%	182
Medium (50-250 employees)	14%	36
Small (10-50 employees)	4%	9
Micro (less than 10 employees)	10%	25
Type of contract		260
Open-ended contract	86%	224
Fixed-term contract	14%	36
Main work activities		259
Intellectual	90%	234
Physical and intellectual	9%	23
Physical	1%	2
Telework hours by contract		260
None	43%	113
1-3 days/month	20%	51
4-8 days/month	25%	65
8 days or more/month	12%	31
Type of work		260
Telework	57%	147
Traditional	43%	113

Method

Participants and Procedure

The present research consisted of two phases. As no instrument measuring the quality of telework, as perceived by employees, existed, the first stage of the study involved questionnaire development,

while the second phase involved questionnaire validation. To this aim, we administered an online survey measuring the quality of telework, job resources, job demands, work engagement, and work-family balance and collected demographic information (i.e., age, gender, number of children and children under 12 years, whether they cared for elderly individuals, job role, working hours, company size, type of contract and work, main work activities, and telework hours by contract). Data were obtained from three organizations with headquarters in two Italian regions: Lombardy and Emilia-Romagna. Criteria for an organization's inclusion were that it had implemented telework or had the intention to implement it. In this way, all organizations and professions, mainly consisting of physical activities and therefore not suitable for telework implementation, were excluded. Participants were included if they were at least 18 years old, were able to read and understand the Italian language, and provided informed consent.

Table 2. Descriptive Statistics of the Sample, Split in Workers with Telework Work Contract (N = 147), and Workers with Traditional Work Contract (n = 113)

	Telecommuters				
Variable	%	*N*	%	*N*	Chi² (*df*, *N*)
Gender		147		113	7.5 (1, 260)*
Female	50%	74	67%	76	
Number of children		147		113	18.6 (1, 260)***
None	37%	54	64%	72	
One or more	63%	93	36%	41	
Number of children under 12 years		146		111	7.16 (1, 257)**
None	67%	98	82%	91	
One or more	33%	48	18%	20	
Elderly caregiver		147		113	1.7 (1, 260)
Yes	20%	29	27%	30	
No	80%	118	73%	83	
Job role		147		112	19.92 (2, 259)**
Entrepreneur	3%	4	5%	5	
Manager	3%	5	0%	0	
Supervisor	21%	31	7%	8	
White-collar	71%	105	80%	90	
Other	2%	2	8%	9	
Working hours		147		111	0.07 (1, 258)
Full-time	84%	124	86%	95	
Company size		144		108	39.2 (3, 252)***
Big (250+ employees)	87%	126	52%	56	
Medium (50-250 employees)	7%	9	25%	27	
Small (10-50 employees)	1%	2	6%	7	
Micro (less than 10 employees)	5%	7	17%	18	
Type of contract		147		113	27.03 (1, 260)***
Open-ended contract	96%	141	73%	83	
Fixed-term contract	4%	6	27%	30	
Main work activities		147		113	2.6 (2, 259)
Physical	0%	0	3%	2	
Intellectual	91%	134	88%	100	
Physical and intellectual	9%	13	9%	10	

*p < .01, **p < .005, ***p < .001.

The study was approved by the human resources director of each organization. Participants were informed by mail and welcomed to ask questions or express concerns about the study. Data were treated anonymously and confidentially, and participants' privacy was guaranteed. The study was approved by the Ethics Committee of the Department of Psychology, University of Milano-Bicocca.

A total of 330 questionnaires were collected from January to August 2019. During data analysis, 47 questionnaires were excluded because they were substantially incomplete; that is, more than 40 per cent of the answers were missing. Table 1 presents the descriptive statistics of the total sample (N = 260), and Table 2 provides the detailed descriptive statistics of the sample by type of work contract, i.e., telework, with at least 1 telework day/month according to the work contract, and traditional, with no telework days/month according to the work contract.

Quality of Telework Questionnaire Development

Questionnaire development followed a four-step procedure (DeVellis, 1991). The first step concerned the definition of the telework components to be measured. As claimed, telework addresses (a) an agile workplace, operationalized as the quality of workstation settings, both inside and outside the office; (b) a flexible worker, operationalized as an employee having substantial autonomy and flexibility to manage his/her work schedules and to decide where to work; and (c) virtual leadership, operationalized as the clarity of assigned work objectives. As a second step, the literature was searched for instruments measuring constructs as close as possible to those of interest, and a list of items was obtained. In the third step, items were independently evaluated by three researchers. In the last step, each researcher's evaluations of the items were combined, and items were selected if their pertinence was agreed upon through a discussion. Items were chosen and developed as follows:

a) Ten items from the work design questionnaire (WDQ) (Morgeson & Humphrey, 2006) were selected to measure the quality of the agile workspace and repeated twice (for a total of 20 items): the first time referring to workstation settings inside the organization and the second time referring to workstation settings outside the organization. Items included the assessment of contextual characteristics of the agile office: ergonomics, reflecting the degree to which the job allows for appropriate movement and posture, work conditions, reflecting the environment (i.e., health hazards, noise, temperature, and cleanliness) in which the job is performed, and equipment use, referring to the assortment and complexity of the equipment and technology used in the job (Morgeson & Humphrey, 2006). An example item is as follows: "Seating arrangements in the job are adequate (e.g., ample opportunities to sit, comfortable chairs, and good postural support)." The response scale ranges from 1 (*strongly disagree*) to 5 (*strongly agree*).

b) Ten new items were developed to assess the conditions offered to the flexible worker: 3 new items were developed to measure the management of work schedules, and 7 new items were developed to measure the management of workstation settings inside and outside the organization. Example items are as follows: "I autonomously decide when to work during the day," and "In my organization, I am allowed to work from anywhere (e.g., external spaces, coworking spaces, and home)". The response scale ranges from 1 (*strongly disagree*) to 5 (*strongly agree*).

c) Five items from the "role" dimension of the HSE indicator tool (Cousins et al., 2004; Italian version by Toderi et al., 2013) reflect whether employees understand their role within the organization and whether the organization makes sure that they have no conflicting roles. This is especially relevant if we consider the importance of setting telecommuters' clear and engaging objectives, as stated by the management by objectives approach (Kreitner & Kinicki, 2013). An example item is as follows: "I am clear what is expected of me at work." The response scale varies from 1 (*strongly disagree*) to 5 (*strongly agree*).

Other Variables

Job resources

Job control. The "control" dimension from the HSE indicator tool (Cousins et al., 2004; Italian version by Toderi et al., 2013) was used to measure how much an employee says that he/she has the power to direct his/her work (e.g., "I can decide when to take a break"). Respondents answered six items on a scale ranging from 1 (*never* or *strongly disagree)* to 5 (*often* or *strongly agree*), with lower scores indicating lower levels of job control (6 items, α = .80).

Quality of relations. The "relationship" dimension from the HSE indicator tool (Cousins et al., 2004; Italian version: Toderi et al., 2013) was used to measure how much positive practices aimed at avoiding conflict or dealing with inappropriate behaviour are promoted in the workplace (e.g., "There is friction or anger between colleagues"). Respondents answered four items on a scale ranging from 1 (*never* or *strongly disagree*) to 5 (*often* or *strongly agree*), with lower scores indicating a lower quality of relations (4 items, α = .75).

Supports. "Supervisor support" and "peer support" dimensions from the HSE indicator tool (Cousins et al., 2004; Italian version by Toderi et al., 2013) were used to measure how much the organization and management provide employees with resources and encouragement and how much colleagues do so, respectively (e.g., "I am given supportive feedback on the work I do", and "I get the help and support I need from colleagues", for the two scales). Respondents answered five and four items, respectively, for the two dimensions, on a scale ranging from 1 (*never* or *strongly disagree*) to 5 (*often* or *strongly agree*), with lower scores indicating lower levels of support (5 items, "supervisor support" α = .86; 4 items, "peer support" α = .88).

Job demands

Demands. The "demands" dimension from the HSE indicator tool (Cousins et al., 2004; Italian version by Toderi et al., 2013) was used to measure issues such as workload and work patterns (e.g., "I have to work very intensively"). Respondents answered eight items on a scale ranging from 1 (*never* or *strongly disagree*) to 5 (*often* or *strongly agree*), with lower scores indicating higher job demands (8 items, α = .83).

Technology intrusion. The off-work hours technology-assisted job demand (OFF-TAJD; Ghislieri et al., 2017) was used to measure technology intrusion in our sample by asking respondents about how often the organization demands them to use technology for work during off-work hours (e.g., "How often does your organization require you to answer phone calls and emails during off-hours?"). Respondents answered three items on a scale ranging from 1 (*never*) to 5 (*always*), with higher scores indicating higher levels of technology intrusion (6 items, α = .94).

Work engagement. The short version of the Utrecht Work Engagement Scale (UWES-9; Schaufeli et al., 2006; Italian version by Balducci et al., 2010) was used to measure work engagement in our sample (e.g., "At my work, I feel bursting with energy"). The response scale ranged from 1 (*never*) to 7 (*every day*). The general index of work engagement is calculated by summing all the items of the UWES-9. A greater value corresponds to greater job engagement (9 items, α = .95).

Work-family balance. The following two scales were used to measure work-family balance in our sample.

a) The Work-Family Conflict Scale (Matthews et al., 2010; Italian version by Loscalzo et al., 2019) was used to measure incompatibility in the functioning demands in the two domains of work and family, in the directions of both work to family and family to work (e.g., "I have to miss family activities due to the amount of time I must spend on work responsibilities"). Respondents answered nine items on a scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), with higher scores indicating higher levels of conflict (6 items, α = .68).

b) The Work-Family Enrichment Scale (Ghislieri et al., 2017) was used to measure the degree to which positive work experiences have an impact on family life (e.g., "At work, you feel positive emotions, and this helps you be a better family member"). Respondents answered three items on a scale ranging from 1 (*strongly disagree)* to 5 (*strongly agree*), with higher scores indicating higher levels of work-family enrichment (3 items, α = .92).

Work-family balance index was calculated as the mean value of the Work-Family Conflict Scale and Work-Family Enrichment Scale indices (9 items, α = .81).

Data Analysis

Psychometric and comparative (ANOVAs) analyses were conducted. The construct validity of the QoT-q was first tested exploratively by means of principal component analysis (PCA) with varimax rotation. The scree test method was used to determine the number of factors. Items were considered indicators of the same factor if they had primary factor loadings higher than .40 and a ratio between primary and secondary factor loadings higher than two. Cronbach's alphas were also checked in the item selection procedure. Second, ANOVAs were performed to compare the scores of dependent variables across employees in groups set up as follows: group 1, "traditional workers", including employees having no telework days/month under contract or having at least 1 telework day/month under contract but not benefitting from it, with no overall mean score on the quality of implemented telework; group 2, "Lq telecommuters", comprising employees actually benefitting from at least 1 telework day/month under contract, with a mean overall score on the quality of telework that was below 3.5 (on a 5-point scale); and group 3, "Hq telecommuters", including employees actually benefitting from at least 1 telework day/month under contract, with a mean overall score on the quality of telework that was higher than 3.5 (on a 5-point scale). Bonferroni correction was used as a post hoc procedure to correct family-wise error rate following ANOVAs (Armstrong, 2014). All analyses were conducted by means of IBM SPSS version 25 (IBM Corp., Armonk, NY, USA).

Results

Principal Component Analysis

Table 3 shows the results of the PCA (construct validity) and reliability analyses of the QoT-q items. The scree test identified five factors, a five-factor structure with 29 items that explained 62 per cent of the variance was obtained.

QoT scale 1—Outside Workplace—consists of 10 items. The factor loadings in Table 3 are based on the pattern matrix. Cronbach's α of the scale was very good (α = .84).

QoT scale 2—Inside Workplace—consists of 9 items. Item 20—"The job occurs in a clean environment"—was removed because the ratio between primary and secondary factor loadings was lower than two. Despite this ratio being lower than two, item 16—"The job takes place in an environment free from health hazards"—was kept in the scale due to the importance of assessing health risks in the workplace. Cronbach's α of the scale was very good (α = .89).

QoT scale 3—Time Management—consists of 2 items. Item 23—"I work outside the traditional time slots (Mon-Fri, e.g., 8 am-1 pm, 2 pm-5 pm)" —was deleted because the primary factor loading was lower than .40. Cronbach's α of the scale was acceptable (α = .64).

QoT scale 4—Workplace Management—consists of 4 items. Three items were deleted: item 28—"In my organization, there are spaces

Table 3. Factorial Structure of the Quality of Telework (QoT-q) with 6 Deleted Items (N = 147 telecommuters), Varimax Rotation

#	Item	Outside workplace (α = .84)	Inside workplace (α = .89)	Time management (α = .64)	Workplace management (α = .65)	Work by objectives (α = .83)
With regard to the characteristics of your workplace OUTSIDE your employer's premises:						
1	The climate at the workplace is comfortable in terms of temperature and humidity	.847	.087	-.009	.173	.075
2	The job occurs in a clean environment	.826	.148	.059	.171	.074
3	The job takes place in an environment free from health hazards	.792	.216	.009	.135	.088
4	The seating arrangements on the job are adequate (e.g., ample opportunities to sit, comfortable chairs, good postural support)	.770	.079	.151	-.151	.103
5	The workplace allows for all size differences between people in terms of clearance, reach, eye height, legroom, etc.	.756	.135	.287	-.011	.125
6	The workplace is free from excessive noise	.714	-.036	-.103	.353	.127
7	My workplace is comfortable	.698	.213	-.019	-.116	.082
8	My workplace is ergonomic	.695	.111	.184	-.256	.101
9	My workplace is noisy	-.605	.071	.121	.043	-.087
10	My workplace has the technology that I need	.556	.127	.147	-.242	.185
With regard to the characteristics of your workplace INSIDE your employer's premises (e.g., traditional office, other office locations):						
11	My workplace is comfortable	.182	.869	-.072	.031	.024
12	My workplace is ergonomic	.258	.774	-.074	.061	.057
13	The seating arrangements on the job are adequate (e.g., ample opportunities to sit, comfortable chairs, good postural support)	.115	.771	-.112	.045	.104
14	The climate at the workplace is comfortable in terms of temperature and humidity	.043	.713	.241	.142	.204
15	My workplace is noisy	-.111	.667	.269	.035	.140
16	The job takes place in an environment free from health hazards	.046	.659	.334	.214	.226
17	The workplace allows for all size differences between people in terms of clearance, reach, eye height, legroom, etc	.213	.655	.134	-.021	.212
18	The workplace is free from excessive noise	-.108	.645	.241	.155	.211
19	My workplace has the technology that I need	.308	.639	-.219	-.033	-.057
20	The job occurs in a clean environment[1]	.340	.529	-.208	.003	-.009
21	I autonomously decide when to work during the day	.022	.092	.773	.062	-.015
22	I autonomously manage my workday schedules	.122	.047	.611	.142	.004
23	I work outside the traditional time slots (Mon-Fri, e.g. 8am-1pm, 2pm-5pm) [1]	-.048	-.104	.332	-.062	.230
24	In my organization, I am allowed to use only defined agile working spaces that guarantee certain safety standards	-.151	.088	.165	.683	.043
25	In my organization, I am allowed to work from anywhere (e.g., external spaces, co-working spaces, home)	.217	.268	.229	.679	.014
26	In my organization, I feel free to work anywhere	.255	.349	.345	.631	-.021
27	In my organization, personal workstations exist	-.192	-.091	-.353	.590	-.078
28	In my organization, there are spaces that allow me to choose my workstation according to the activity I have to perform (spaces for individual work, spaces for video conferences, spaces for group work)[1]	-.048	.406	.034	.563	.009
29	In my organization, I am guaranteed to have all the means that I need to achieve my work goals even from a distance[1]	.366	.279	.298	.377	.157
30	In my organization, to achieve my goals is not important where I am working[1]	.392	-.071	.390	.367	-.058
31	I am clear about the goals and objectives for my department	.211	.174	.014	-.033	.851
32	I am clear what is expected of me at work	.266	.159	-.039	.050	.776
33	I understand how my work fits into the overall aim of the organization	.204	.102	.389	-.087	.723
34	I am clear what my duties and responsibilities are	.055	.305	-.165	.040	.683
35	I know how to go about getting my job done[1]	.190	.141	-.056	.318	.408

Note. In the Outside Workplace and Inside Workplace scales, all items were adapted from Morgeson and Humphrey, 2006. In the Time Management and Workplace Management scales, all items were newly developed. In the Work by Objectives scale, all items were adapted from Toderi et al., 2013.
[1]Items deleted, with factor loadings as at the moment of their deletion.

that allow me to choose my workstation according to the activity I have to perform (spaces for individual work, spaces for video conferences, and spaces for group work)" —was deleted because the ratio between primary and secondary factor loadings was lower than two; item 29—"In my organization, I am guaranteed to have all the means that I need to achieve my work goals even from a distance"

—and item 30—"In my organization, to achieve my goals, it is not important where I am working"—were deleted because primary factor loadings were lower than .40. Despite the ratio between primary and secondary factor loadings being lower than two, item 26—"In my organization, I feel free to work anywhere"—was kept in the scale due to the fact that the Cronbach's α value would had been lower if the item were deleted. Despite the ratio between primary and secondary factor loadings being lower than two, item 27—"In my organization, personal workstations exist"—was kept in the scale due to the low number of items in the scale and the importance of assessing the availability of personal workstations in the workplace. The Cronbach's α value of the scale was acceptable (α = .65).

QoT scale 5—Work by Objectives—consists of 4 items. Item 35—"I know how to go about getting my job done"—was deleted because the ratio between primary and secondary factor loadings was lower than two. The Cronbach's α value of the scale was very good (α = .83).

The Impact of the Quality of Telework on Employee Outcomes

Table 4 shows the mean scores and standard deviations of the quality of telework areas—agile workplaces, flexible workers, and virtual leadership. An overall mean score for the quality of telework was computed as the mean of the means of quality of telework scales. Based on this overall score, three groups were created: group 1 "traditional workers," with no telework and therefore no overall mean score for the quality of telework; group 2 "Lq telecommuters," with a mean overall score for the quality of telework below 3.5 (on a 5-point scale); and group 3 "Hq telecommuters," with a mean overall score for the quality of telework higher than 3.5 (on a 5-point scale).

Table 4. Means and Standard Deviations of the Quality of Telework areas (N = 110)

Measure	Mean	*SD*
Agile workplaces		
Outside workplace	3.66	0.67
Inside workplace	3.37	0.77
Flexible worker		
Time management	3.04	1.18
Workplace management	2.57	1.11
Virtual leadership		
Work by objectives	3.99	0.75
Quality of telework overall score	3.54	0.51

Note. Scales are on 5-point.

Table 5 shows the results of ANOVAs with the Bonferroni correction. Group 3, including workers with Hq telework, differed significantly from group 1, comprising traditional workers, and group 2, composed of workers with Lq telework. Group 3, "Hq telework", perceived on average significantly higher job control, $F(2, 214) = 16.85$, $p < .001$, $\eta^2 = .14$, supervisor support, $F(2, 217) = 8.19$, $p < .001$, $\eta^2 = .07$, and coworker support, $F(2, 219) = 4.99$, $p < .01$, $\eta^2 = .04$, than did the other groups. However, contrary to our expectations, group 3, "Hq telework", perceived no higher quality of relations, $F(2, 215) = 3.84$, $p < .01$, $\eta^2 = .03$, compared to group 1, "traditional workers", and lower quality of relations compared to group 2, "Lq telework." Therefore, Hypothesis 1 was only partially confirmed.

Group 3, "Hq telework," slightly different from our expectations, perceived on average significantly lower job demands, $F(2, 215) = 5.67$, $p < .01$, $\eta^2 = .05$, compared to the other groups. However, group 3 perceived no higher technology intrusion, $F(2, 216) = 1.95$, *ns*, $\eta^2 = .02$, compared to group 1, "traditional workers", and group 2, "Lq telework." As a result, Hypothesis 2a was not confirmed, while Hypothesis 2b was confirmed.

Group 3, "Hq telecommuters", reported on average significantly higher work engagement, $F(2, 210) = 7.19$, $p < .001$, $\eta^2 = .06$, and work-family balance, $F(2, 210) = 14.60$, $p < .001$, $\eta^2 = .12$. According to our expectations, Hypotheses 3 and 4 were confirmed.

Discussion

This study contributes to the literature on the effects of telework on work outcomes in diverse ways. First, by addressing the recommendations in the literature (De Menezes & Kelliher, 2011; Peters et al., 2014), the effect of telework on the work engagement and work-family balance of employees was investigated as a synergic effect of different telework practices, rather than as a single practice. As a consequence, we comprehensively framed telework as including at least three core components: 1) agile workplaces, referring to the availability of various workstation settings, 2) flexible workers, with high autonomy and flexibility to manage their time and workplace, and 3) virtual leadership, referring to the empowerment of and clear work objectives set by managers. Second, we used the JD-R model (Bakker & Demerouti, 2007) to theorize the mechanisms that may foster work engagement and work-family balance among telecommuters compared to traditional ones. Third, to evaluate the effect of different degrees of telework implementation on work outcomes, an instrument for assessing the quality of telework (QoT-q), as perceived by employees, was developed and validated.

The QoT-q aims to measure the degree of telework implementation with reference to its three core components: 1) agile workplaces,

Table 5. Group Comparison Mean Scores on Dependent Variables by Quality of Telework (Low versus High-quality versus no Telework) (ANOVA)

Measure	Group 1 Traditional Workers (n = 132)	Group 2 Lq Telecommuters (n = 56)	Group 3 Hq Telecommuters (n = 54)	ANOVA (N = 242)
	$M \pm SD$	$M \pm SD$	$M \pm SD$	$F(df, \eta^2)$
*H*1. Job resources				
Job control	$3.55^{1} \pm 0.77$	$3.64^{1} \pm 0.64$	$4.20^{2} \pm 0.54$	16.85 (2, .14)***
Quality of relations	$1.99^{1,2} \pm 0.70$	$2.05^{1} \pm 0.69$	$1.73^{2} \pm 0.52$	3.84 (2, .03)*
Supervisor support	$3.46^{1} \pm 0.93$	$3.41^{1} \pm 0.76$	$3.99^{2} \pm 0.79$	8.19 (2, .07)***
Co-worker support	$3.83^{1} \pm 0.87$	$3.74^{1} \pm 0.75$	$4.18^{2} \pm 0.59$	4.99 (2, .04)**
*H*2. Job demands				
*H*2a. Job demands	$2.67^{1} \pm 0.66$	$2.72^{1} \pm 0.57$	$2.36^{2} \pm 0.58$	5.67 (2, .05)**
*H*2b. Technology intrusion	$2.02^{1} \pm 0.98$	$2.22^{1} \pm 0.94$	$2.32^{1} \pm 1.00$	1.95 (2, .02)
*H*3. Work engagement	$4.84^{1} \pm 1.61$	$4.96^{1} \pm 1.32$	$5.78^{2} \pm 1.44$	7.19 (2, .06)***
*H*4. Work-family balance	$3.35^{1} \pm 0.69$	$3.38^{1} \pm 0.52$	$3.89^{2} \pm 0.56$	14.60 (2, .12)***

Note. Scales are on 5-point, except for Work Engagement scale that is on 7-point.
[1,2]Mean scores on the same dependent variables with diverse apical letters differed significantly across groups ($p < .05$), as a result of the Bonferroni correction.
*$p < .05$, **$p < .01$, ***$p < .001$.

2) flexible workers, and 3) virtual leadership. The QoT-q consists of 29 items divided over 5 scales: 2 scales, Outside Workplace and Inside Workplace, in the agile workplace area; 2 scales, Workplace Management and Time Management, in the flexible worker area; and 1 scale, Work by Objectives, in the virtual leadership area. The QoT-q appears to be an instrument with very good construct validity and adequate to very good reliability.

The measure of the quality of implemented telework was used to assess differences across groups: 1) "traditional workers" (no telework), 2) "low-quality telecommuters" (Lq telework), and 3) "high-quality telecommuters" (Hq telework).

First, job resources—job control, supervisor support, and coworker support—were found to be significantly higher among Hq teleworkers than among the other groups (*H*1). This finding is in line with the consideration of Hq telework as fostering important job resources both at job and interpersonal levels due to its characteristics (Peters et al., 2014). Relevant telework features that may explain higher job control among Hq teleworkers are, for example, job autonomy in selecting their preferred time and place to work, an improved responsibility for their own goal achievement, and meaningful opportunities such as discretion and judgement (Kreitner & Kinicki, 2013; Peters et al., 2014; Van Steenbergen et al., 2018). At interpersonal level, higher supervisor and coworker support among Hq teleworker may be related to team working characteristics facilitating collaborative exchanges (Peters et al., 2014) and strictly connected to communication and interaction improved by the adoption of typical telework workspaces (Engelen et al., 2019). However, we found a lower quality of relations among Hq teleworkers compared to Lq teleworkers and a significantly different quality of relations compared to traditional workers. This is a remarkable finding, as it can be interpreted by the fact that when workers are outside the workplace for a long time, their interactions with peers mediated by devices hardly become non-superficial human relationships. A sense of belonging, similar to what direct, formal, and informal relationships and interactions offer, is indeed rarely created through telework (Albano et al., 2019). In this sense, the issue of isolation emerges as the "dark side of telework," becoming a risk factor for employee psychological wellbeing. In this context, it is essential to think about how to create opportunities for social participation as an attempt to recover what could be lost, even in the case of high-quality teleworkers (Albano et al., 2019).

Second, Hq telecommuters reported lower levels of job demands than did traditional workers and Lq telecommuters (*H*2a). Regarding technology intrusion, a potential stressor in the case of the high use of technology during off-work hours (Ghislieri et al., 2017), no higher or lower levels were found among Hq teleworkers compared to the other groups (*H*2b). This finding is reasonable, as telework is expected to modify how work is organized and thought of rather than its content or job roles (Neri, 2017). Moreover, in the Hq conditions of telework, coping with job demands should be enabled by improved job resources and supportive working conditions (Peters et al., 2014), which may explain the lower level of job demands among Hq teleworkers.

Third, Hq telecommuters reported higher work engagement than did Lq telecommuters and traditional workers (*H*3). This result is in line with previous findings and can be explained by higher employee autonomy functioning as a motivator or as a buffer to deal with job demands (Gerards et al., 2018; Peters et al., 2014). Hq teleworkers also reported a higher level of work-family balance than did the other groups (*H*4). This finding is in line with the idea that increased job resources (e.g., control and autonomy) should result in improved work-family balance, as work-family effectiveness in balancing resources and demands from work and family domains should be higher (Kossek et al., 2006). Moreover, appropriate technology use, in Hq telework conditions, associated with working time flexibility, has already been found to have a positive impact on employee work-life balance (Ghislieri et al., 2017; Wajcman et al., 2008).

In terms of the strength of its effects, telework quality was found to have the highest impact on workers' job control and work-family balance and the lowest impact on quality of working relationships.

Overall, current findings add evidence to the effectiveness of telework in terms of employee wellbeing. They also remarkably support the utility of the JD-R model to explain how telework affects employee wellbeing: increased telecommuters' job resources both directly and indirectly—that is, buffering job demands—contribute to stimulating positive work engagement and work-family balance among workers. However, this is especially true in the case of HqT, when different practices are integrated into telework implementation. For this reason, we may conclude that not all telework is equally valuable.

Study Limitations

The study provides an initial validation of the QoT-q, but further studies need to confirm and improve questionnaire's structure, validity, and reliability. Moreover, the QoT-q still has room for improvement. As an example, considering the number of items of the final questionnaire version, it is evident that some scales present too many items (e.g., Outside Workplace, 10 items), while other scales have too few items (e.g., Time Management, 2 items). Finally, as there is some evidence regarding differences in the perception and meaning attached to telework across some categories, it is reasonable to test the measurement invariance of the questionnaire for gender, age group, and company size. Our sample size was not adequate for performing all these analyses, although such analyses were beyond the scope of this study.

Implications for Future Research and Practice

Further validation of the QoT-q should be conducted in larger samples from various work and geographical sectors. A new sample in which it is possible to trace a company to perform analyses taking into account the variance shared by workers of the same company should be recruited. Further studies should test QoT-q measurement invariance across various groups. The quality of telework index was calculated as an overall mean of all telework components, instead of a weighted mean of every single telework component. Future research should address this issue and use a longitudinal design, measuring dependent variables before and after telework implementation, to provide more information about the change in outcomes. As we focused on three telework components (i.e., agile workplaces, flexible workers, and virtual leadership) and on two wellbeing outcomes (i.e., work engagement and work-family balance), increasingly different implemented working conditions and dependent variables can be considered to collect further evidence of the effects of telework on employee outcomes. The synergic effect of telework on employee outcomes should be particularly investigated with specific attention paid to the cultural aspects of telework and virtual leadership, still not often considered enough when implementing telework (Peters et al., 2014). Finally, when implementing telework at any time, organizations can use the QoT-q to assess employees' perspectives, balancing management and employee needs. Additionally, this study supported the importance of the use of the JD-R model when analyzing the impacts of telework practices. In conclusion, it is important to underline the potentialities of the proposed quality of the telework model. If this study had been conducted much earlier in the COVID-19 pandemic, the QoT model might have been very useful in understanding workers' telework experiences during the COVID-19 epidemic all over the world. Indeed, during the COVID-19 pandemic, many workers suddenly started teleworking, in different modalities and at a very high intensity, as never seen before. Since

this intensive form of telework may have consistent consequences on telework implementation and use, investigating—through the QoT model—the quality of telework as perceived by employees during the COVID-19 pandemic can be extremely helpful in finding new ways of supporting employees. In particular, how to support employees in teleworking for a long time and from their homes, maintaining high levels of employee wellbeing, is a relevant issue that must be addressed through the use of the QoT model.

Conflict of Interest

The authors of this article declare no conflict of interest

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