Forum: Practical Perspectives

Skills for managing work from home scale (SMWFHS)

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This study developed and tested the validity of a scale that measures skills for managing work from home, such as: informing change, searching for information, establishing priorities, setting and adapting goals, assessing work outputs, distributing tasks, and offering feedback. Participants were 2,038 managers from three Brazilian public organizations. Exploratory, confirmatory, and multigroup factor analyses revealed an 8-item unidimensional structure, excellent reliability indices, and goodness of fit, besides invariance for gender and age groups. The short scale permits testing research models with multiple variables, comparative (voluntary vs. compulsory telework), and cross-cultural studies.
Keywords: work from home; telework; management; scale; validation.

Escala de habilidades para gerenciar o teletrabalho em casa (EHGTC)

Este estudo desenvolveu e testou a validade de uma escala que mede as habilidades para gerir o trabalho desde casa, como: relatar mudanças, buscar informações, definir prioridades, definir e adaptar metas, avaliar os resultados do trabalho, distribuir tarefas e fornecer feedback. Participaram 2.038 gestores de três organizações públicas brasileiras. As análises fatoriais exploratórias, confirmatórias e multigrupo revelaram uma estrutura unifatorial de oito itens,

excelentes índices de confiabilidade e qualidade de ajuste, bem como invariância para gênero e faixas etárias. A escala curta permite testar modelos de pesquisa com múltiplas variáveis, estudos comparativos (teletrabalho voluntário versus compulsório) e estudos interculturais.

Palavras-chave: trabalho a partir de casa; teletrabalho; gestão; escala; validação.

Escala de habilidades para gestionar el teletrabajo en casa (EHGTC)

Este estudio desarrolló y probó la validez de una escala que mide las habilidades para gestionar el trabajo desde casa, como: informar cambios, buscar información, establecer prioridades, establecer y adaptar metas, evaluar los resultados del trabajo, distribuir tareas y dar feedback. Participaron 2.038 directivos de tres organizaciones públicas brasileñas. Los análisis factoriales exploratorios, confirmatorios y multigrupo revelaron una estructura unifactorial de 8 ítems, excelentes índices de confiabilidad y bondad de ajuste, además de invariancia para género y rangos etarios. La escala corta permite probar modelos de investigación con múltiples variables, estudios comparativos (teletrabajo voluntario vs. obligatorio) e interculturales.

Palabras clave: trabajo desde casa; teletrabajo; gestión; escala; validación.

1. INTRODUCTION

Since the COVID-19 pandemic outbreak, several workers and organizations have engaged in teleworking (Ceurstemont, 2020). While many employees have experienced working from home, searching by themselves for ways of coping with challenges – such as adapting rapidly to new forms of communicating, delivering outputs, and maintaining teamwork effectiveness, health, and productivity –, companies might yet struggle to enable practices in a constantly changing workplace and ensure success in virtual teams (Malhotra et al., 2007). Given the complexity of this configuration (Roman et al., 2019) and the not fully understood manager's role to lead efficiently through electronic devices, a thorough reflection on both management and leadership skills required to accompany remote teams can guarantee sound practices (Ruiller et al., 2017), considering the transition into post-pandemic remote work.

Regarding the key competencies of e-leaders while supervising dispersed and digital teams, findings underline a combination of technical, technological, and socio-emotional skills. Managers might coordinate their groups using advanced and appropriate communication technologies (knowing when to opt for synchronous or asynchronous, electronic or traditional methods); share common and clear goals with the team and ensure a supportive context and trustworthiness (Haas & Mortensen, 2016; Savolainen, 2014; Van Wart et al., 2019). Following this view, in telework, compared to the in-office workforce, the managerial mode based on trust is much more important. Leading virtually requires focusing on performance monitoring instead of task control (Pyöriä, 2011); establishing a feedback culture; open communication rules; and efficient resources exchange – tasks, information, goals, ideas, or decisions, which, in turn, generates a sense of psychological safety (Lee, 2021; Raišienė et al., 2020).

Although teleworking has recently received growing scientific attention, team management research has mainly focused on hybrid teams, and studies on e-leadership and teleworkers are scarce (Contreras et al., 2020; Ruiller et al., 2017). This study has been undertaken amid the COVID-19 impacts on virtual workers and teams, so the scale's items consider the specificities of the context e-leaders face.

Given the above, the present study sought to answer the following research question: What are the key competencies that a manager must master to effectively manage work from home in Brazilian organizational contexts? To contribute to the e-leadership field, this study aimed to develop and

search initial validity and reliability evidence of a scale to measure the skills for managing specifically telework. Its validity test was carried out with over 2.000 managers from three Brazilian public organizations, that adopted telework during the COVID-19 pandemic: one organ of the District Executive Branch, and two federal institutions, including the Union Public Prosecution Service and the Federal Judiciary Branch.

2. THEORETICAL BACKGROUND FOR DEVELOPING THE SCALE ITEMS

This study was grounded in the Leadership theoretical model based on lessons learned from the coronavirus pandemic (Mourão et al., 2021). This model considers three central elements for leaders who manage remote teams to achieve positive outcomes for employees and organizations, which are: characteristics of the context, inputs (material, financial, procedural, technological, and human resources), and support of leaders (subdivided into hard skills and soft skills). The construction of the Skills for Managing Work from Home Scale (SMWFHS) was based on the previous literature on the subject, briefly detailed below for each item of the scale – these are followed by their corresponding acronyms assigned in data analyses to facilitate identification by the reader.

Informing change. *"I feel capable of informing my team of all the changes in orientations related to the pandemic that might impact our work"* [Inf].

Managers are responsible for preparing teams for the most challenging situations, ensuring their motivation toward achieving the desired goals, productivity, and well-being (Euko & Cazarini, 2020; Roman et al., 2019). In times of crisis and in the current digital era, they need to develop knowledge on preparing virtual teams (Chen et al., 2020). E-leaders must be able to monitor changes in environmental conditions (e.g., the specific orientations related to the pandemic that might influence work); guide dispersed members, consequently less aware of boundary situations and the dynamics of the overall team (Maduka et al., 2018); and master change management skills, covering change techniques (Van Wart et al., 2019), by keeping the team updated about all the new processes and routines of the business dynamics.

Krumm et al. (2016) argued that for the team's success, it is essential to adapt and cope to adjust to different circumstances with flexibility, deal with confusing and conflicting situations, and share relevant information and resources. Sharing real-time updates and changes leads to trust among members (Jahagirdar & Bankar, 2020), especially when the team leader e-manages employees.

Searching for information. *"I feel capable of localizing the information I need to manage my team efficiently"* [LocInfo].

E- leaders need to know how to use computers and digital media and demonstrate technological skills (Roman et al., 2019; Van Wart et al., 2019) to manage information and coordinate their virtually connected groups. Mastering new and advanced technologies enables e-leaders to choose the most appropriate electronic tools for each work situation; build trust and relationships with dispersed team members – including those from different cultures –; and monitor team members' correct use

of information and communication technology (ICT) (Euko & Cazarini, 2020; Dulebohn & Hoch, 2020; Malhotra et al., 2007).

Establishing priorities. *"I feel capable of establishing priorities for my team during compulsory remote work" [Prior].*

Among virtual leadership competencies, the ability to build team orientation (Maduka et al., 2018) and effective time management (Krumm et al., 2016) might influence the results. Virtual team leaders need additional communication skills to deal with the lack of face-to-face contact with team members, avoiding miscommunication and ensuring clarity and communication flow (Dulebohn & Hoch, 2020; Roman et al., 2019; Van Wart et al., 2019). Distant communication can be mainly work-oriented, with close activity tracking and monitoring of the work objectives (Ruiller et al., 2017). In this sense, leaders play an essential role in assisting their team in establishing clear priorities, which, in turn, will affect work success. Accurately prioritizing the daily work helps the team members manage their time and organize their activities, seeking the fulfillment of objectives. In times of a pandemic, when uncertainty and change are given, priorities will change unexpectedly, and leaders need to take on an adaptable and flexible posture so that tasks are completed.

Setting (and adapting) goals. *"I feel capable of setting viable goals for my team during the period of compulsory remote work" [Meta] and "I feel capable of adapting my team's goals due to the circumstances of dealing with the COVID-19" [Flexib].*

Keeping up with organizational goals is critical (Krumm et al., 2016). Thus, a successful e-leader needs to ensure that the dispersed team understands the work objectives (Malhotra et al., 2007). Regarding this topic, Haas and Mortensen (2016) underlined that one of the key competencies of leaders while supervising virtual teams is sharing common and clear goals. Moreover, relaxing or adapting the goals to the circumstances faced in the pandemic points to a leader being aware of the specificities and difficulties subordinates might be dealing with, such as taking care of the children who are not attending on-site classes and more hours dedicated to household chores (Shockley et al., 2021). E-leaders should be able to build responsible teams (Roman et al., 2019) through a sense of trust and honesty, which includes being attentive to the worker's needs, such as balancing work and life (Van Wart et al., 2019).

Assessing work outputs. *"I feel capable of assessing, periodically, my team's outputs during compulsory remote work" [Monit].*

Managers must check the work outcomes, examine whether the objectives have been met, and monitor the quality and progress of the tasks (Krumm et al., 2016; Ruiller et al., 2017). In addition, they should be aware of the work that team members are doing, their deadlines, availability, and feelings to better identify and address performance and outcome issues (Maduka et al., 2018). Monitoring teamwork progress is one of the leadership practices for successful virtual teams (Malhotra et al., 2007).

Distributing tasks. *"I feel capable of distributing tasks for the members of my team considering the skills and work conditions of each one"* [Distr].

The e-leader needs to be aware of the team's strengths and weaknesses, its group dynamics at work, and its social environments and interactions (Maduka et al., 2018). If leaders are aware of team members' appropriation and use of digital technologies (Malhotra et al., 2007), they might consider tasks that are more appropriate for each one; or their lifestyle, being able to make sound judgments in the workplace if a problem arises. Van Wart et al. (2019) have appointed fairness as a competency that might be included in effective e-leadership.

Offering constructive feedback. *"I feel capable of offering constructive feedback to the members of my team (indicating improvement opportunities)"* [Feed].

Promoting adequate social interactions and showing off social skills have been highlighted as effective e-leaders' skills (Roman et al., 2019; Van Wart et al., 2019). Teleworking seems to require that leaders review their traditional management practices, emphasizing the important role of managerial support (Mourão et al., 2023), as its perception affects well-being and other organizational indicators, such as engagement at work (Singh et al., 2017).

One of the most effective communication tools leaders use is feedback, as it boosts effective practices and changes the failed ones. Employees can reorganize, improve, or modify their behaviors, attitudes, and cognitive processes through useful and constructive feedback to eliminate the observed discrepancy in their performance. Providing guidance and support regarding their work tasks, in addition to showing that one cares about their subordinates, can increase organizational results (Shanock et al., 2019), besides ensuring healthier workers (Acuña-Hormazabal et al., 2021).

Work-family interference. *"I feel capable of talking to my family about the need to respect the period I'm working remotely (avoiding interruptions)"* [DiF].

Although teleworking prevents distractions from co-workers (Kłopotek, 2017), given the specific circumstances of working from home 24/7 during the pandemic, workers have had to share the same space with a partner (also teleworking) and/or children (attending online classes due to the temporary closure of schools), being exposed to constant interruptions. These interruptions unrelated to work serve as potential sources of conflict and environmental risks of stress and exhaustion (Aderaldo et al., 2017). Along with the intensified workload, the demands of family members tend to increase work-family conflicts, considering that the physical distance derived from the hours working in an office no longer exists (Lemos et al., 2020).

In this sense, an adaptive capability of workers, particularly of leaders, has been demanded (Dirani et al., 2020), such as social skills that include open communication and assertiveness (Savolainen, 2014), besides the ability to manage work and non-work cycles (Malhotra et al., 2007). In this case, not only communication about the tasks can directly affect the performance of the virtual team (Garro-Abarca et al., 2021), but so can talking to family members about respecting working hours.

3. METHOD

3.1 Participants

Participants were 2,038 managers of three Brazilian public organizations that had adopted remote working as a temporary emergency measure due to the COVID-19 pandemic. Of the participants, 50.1% were male, 65.2% ranging in age from 38 to 57 years old, 70.2% were married, or in a common-law marriage, 75.0% oversaw supervising teams of 1 to 10 people, and 57.9% had no previous experience managing telework (of the 42.1% who had managed telework before the pandemic, 90.3% reported it as being a positive experience).

3.2 Data collection procedure

Managers received an e-mail invitation, from April to June 2020, to participate in the study by answering the questionnaire through an external link. Before proceeding to the scale, participants were given all relevant information about the research, including its ethical issues, and gave their consent before responding.

3.3 Instrument

The Skills for Managing Work from Home Scale (SMWFHS) is an 8-item self-report questionnaire (see Appendix), using 5-point response alternatives scored from 1 "strongly disagree" to 5 "strongly agree". As all items were positively worded, greater agreement to an item suggests a higher perception of mastering this skill.

Human Resources experts (n =7) from the three organizations in the study, who had previous experience in telework, revised the content validity of the SMWFHS 9-item version. After this stage, most experts considered that the item DiF, "I feel capable of talking to my family about the need to respect the period I'm working remotely (avoiding interruptions)," should be removed from the scale. From their perspective, even if dealing with work-family conflict might be a critical issue when working from home, it was the only item referring to family and not directly to remote workers' and remote teams' management. The statistical validation confirmed this decision, as the item had the lowest factor loading compared to the others.

3.4 Data analysis

The programs FACTOR v. 11.02.04 and JASP v. 0.14.1.0. were used to run the analyses. To investigate the factor structure of the scale, we first conducted an Exploratory Factor Analysis using a correlation matrix and the extraction method Weighted Least Squares. The adequacy of the matrix was evaluated using Bartlett's statistic and Kaiser-Meyer-Olkin (KMO) test. To determine the number of dimensions, we used a Parallel Analysis procedure and the rotation method Promax. To confirm its factor structure, a Confirmatory Factor Analysis was performed using the estimation method Robust Diagonally Weighted Least Squares and the standardized estimates, followed by a Multigroup Confirmatory Factor

Analysis (MGCFA) to verify the invariance of the measure regarding the participants' gender and age group. To judge the model fit, the following goodness-of-fit indices were considered acceptable: incremental indices (*CFI* and *TLI*) higher than .90 (ideally above .95) and error rates (*RMSEA* and *SRMR*) lower than .08 (ideally below .05). For the reliability indices (McDonald's Omega/Cronbach's Alpha), we considered > .70; to confirm the ΔCFI invariance (< .01); and the chi-square test (χ^2/df) was not utilized due to the large sample size of the study.

4. RESULTS

### 4.1 Exploring the factor structure of the scale

The KMO (.94) and Bartlett's test (9963.69, df=28, p<.001) suggest the interpretability of the correlation matrix of the items. The parallel analysis advised one factor as the most representative structure for the data, the associated eigenvalue being 4.72 and accounting for 59.0% of the variance. Items' factor loadings ranged from .65 to .83, and the uniqueness ranged from .30 to .58. The scale presented excellent reliability indices: α=.91; ω=.92.

4.2 Confirming the factor structure of the scale

The original model (one-factor empirical structure) presents excellent fit indices (CFI=.999; TLI=.999; SRMR=.029; RMSEA=.014; RMSEA IC 90%=.0001-.025), totaling eight items with factor loadings between .65 and .83. All these adequate indicators confirm the fit of the data to the model and a parsimonious structure (Figure 1).

FIGURE 1 **SINGLE-FACTOR MODEL OF SKILLS FOR MANAGING WORK FROM HOME WITH STANDARDIZED LOADINGS**
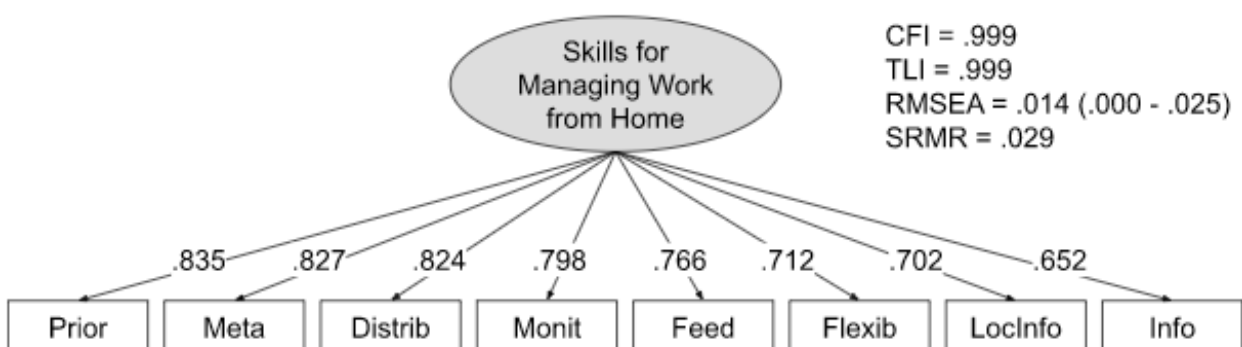
Note. All factor loadings p < 0,01; X² = chi-square; df = degrees of freedom; CFI = Comparative Fit Index; TLI = Tucker Lewis Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual.

Source: Elaborated by the authors.

4.3 Testing the invariance of the scale

Because gender differences remain in most work and organizational contexts, and those inequalities even increased during the pandemic (Shockley et al., 2021), the analysis of the invariance of the measure allows for comparing groups of participants without attributing to the scale of their possible score differences. In the invariance tests, the gender category split into male (n = 1,022; 50.1%) and female (n = 1,016; 49.8%), and the age group category into 18 to 37 years old (n = 575; 28.2%), 38 to 47 years old (n = 773; 37.9%) and over 48 years old or more (n = 690; 33.9%). The MGCFA indices (Table 1) corroborate the configural invariance of the SMWFHS for gender and age groups. In addition, the SMWFHS is invariant regarding the factor loadings (metric), intercepts (scalar), and item errors (strict/residual).

TABLE 1 RESULTS OF MULTIGROUP CONFIRMATORY FACTOR ANALYSIS FOR GENDER AND AGE GROUP

	Gender Invariance				Age Group Invariance			
	Configural	Metric	Scalar	Strict	Configural	Metric	Scalar	Strict
CFI	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
ΔCFI	.001	.001	.001	.001	.001	.001	.001	.001
TLI	1.002	1.001	1.001	1.002	1.005	1.003	1.003	1.002
RMSEA	~.000	~.000	~.000	~.000	~.000	~.000	~.000	~.000
RMSEA CI 90%	~.000-.012	~.000-.012	~.000-.012	~.000-.007	~.000-.000	~.000-.012	~.000-.012	~.000-.009

Source: Elaborated by the authors.

5. DISCUSSION

This study provides an original scale with excellent psychometric characteristics to measure the skills for managing telework. The SMWFHS consists of a brief instrument developed to suit the specificities of an unexpected context of the COVID-19 pandemic that forced many workers to work from home, centered mainly on managers, who had to face the challenges of supervising teams remotely. Nevertheless, the SMWFHS, with some adaptations to the items, also serves as a valuable tool in assessing telework management skills in a post-pandemic period.

The decision to remove an item related to a soft skill (DiF "I feel capable of talking to my family about the need to respect the period I'm working remotely [avoiding interruptions]"), based on practical, theoretical, and statistical perspectives, points out that there are still avenues to research concerning the required skills to thrive at telework. Besides the more often known, disseminated, and trained skills (e.g., setting goals, offering feedback, etc.), employees seeking to balance work and

family responsibilities will increasingly demand skills in the social and affective domains. Instead of the distractions and interruptions in the office, they will face others at home, which can be potential sources of conflict (Aderaldo et al., 2017). Changes in intra- and interpersonal relationships, work routines, and online communication might interfere not only with performance results but also with the well-being of teleworkers (Wang et al., 2021). Thus, future research should explore the hard and the soft skills needed for telework and investigate the correlations between such skills and other relevant variables.

Comparing the theoretical framework with the results obtained in the study reveals several noteworthy findings. Firstly, the theoretical foundation emphasizing the importance of leaders in informing change aligns with the findings that managers felt capable of updating their teams about pandemic-related changes impacting their work (Mourão et al., 2021). This correspondence underscores the significance of effective communication in remote leadership, particularly during times of crisis (Chen et al., 2020; Dulebohn & Hoch, 2020; Euko & Cazarini, 2020; Malhotra et al., 2007).

Furthermore, the emphasis on searching for information in the theoretical framework resonates with the study's results, indicating that managers felt confident in locating necessary information to manage their teams efficiently. This underlines the importance of technological proficiency and information management skills for successful telework management, as highlighted in the literature (Euko & Cazarini, 2020; Roman et al., 2019; Ruiller et al., 2017; Van Wart et al., 2019).

Moreover, the inclusion of an item related to adapting goals due to the circumstances of dealing with COVID-19 further stresses the adaptive nature of effective remote leadership pointed out in the theoretical model (Mourão et al., 2021). The ability of managers to adapt goals in response to changing circumstances not only reflects their agility and responsiveness but also their consideration of the unique challenges faced by remote workers during the pandemic. This adaptive capacity is crucial for maintaining team motivation, productivity, and well-being in the face of unprecedented disruptions. Additionally, considering the evolving nature of remote work dynamics, ongoing investigation into the adaptability and effectiveness of remote leadership strategies remains imperative to support organizations in navigating the complexities of remote work environments effectively (Dulebohn & Hoch, 2020; Krumm et al., 2016; Maduka et al., 2018; Malhotra et al., 2007; Roman et al., 2019; Shockley et al., 2021).

In conclusion, this study has developed and validated the Skills for Managing Work from Home Scale (SMWFHS), providing a reliable and concise instrument to measure the essential competencies required for effective telework management, particularly in the context of the COVID-19 pandemic. The rigorous psychometric analyses conducted demonstrate the robustness of the scale's factor structure, reliability, and invariance across gender and age groups. When returning the results to the managers of the three institutions that participated in the study, they recognized that the scale items allow identifying and quantifying key skills such as informing change, setting goals, and offering feedback. In this sense, they assessed that the SMWFHS offers contributions to the practice of telework management. However, further research is needed to explore additional dimensions of telework skills, including soft skills related to family dynamics and well-being, as well as to establish convergent and concurrent validity. Nonetheless, the SMWFHS stands as a significant contribution to the field, facilitating comparative and cross-cultural studies and serving as a practical tool for assessing and enhancing telework management capabilities in the post-pandemic era, where remote work continues to play a prominent role in organizational dynamics.

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DATA AVAILABILITY

The entire dataset supporting the results of this study is available upon request to the corresponding author (Juliana Legentil). The dataset is not publicly available due to ethical restrictions and participant confidentiality concerns, but de-identified data can be available for interested researchers.

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APPENDIX

14

BOX A SKILLS FOR MANAGING WORK FROM HOME SCALE (SMWFHS)

Label	Item
Prior	I feel capable of establishing priorities for my team during compulsory remote work
Meta	I feel capable of setting viable goals for my team during the period of compulsory remote work
Distr	I feel capable of distributing/assigning tasks for the members of my team, considering the skills and work conditions of each one
Monit	I feel capable of assessing, periodically, my team's outputs during compulsory remote work
Feed	I feel capable of offering constructive feedback to the members of my team (indicating improvement opportunities)
Flexib	I feel capable of adapting my team's goals due to the circumstances of dealing with the COVID-19
LocInfo	I feel capable of localizing the information I need to manage my team efficiently
Inf	I feel capable of informing my team of all the changes in guidelines related to the pandemic that might impact our work

Source: Elaborated by the authors.