

A short scale for managerial support to teleworkers

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Abstract

Compulsory teleworking has affected workers in several countries, increasing concerns about managerial support. This study aimed to build and present validity evidence of the Short Scale for Managerial Support to Teleworkers. We carried out four successive steps, namely: adapting items from other managerial support scales or related constructs to the teleworking context; exploratory factor analysis and network analysis ($N = 3,769$); confirmatory factor analysis ($N = 3,839$); invariance analysis considering gender and education ($N = 7,608$). As a result, the scale has a unifactorial structure with five items and quite favorable psychometric indicators regarding validity, reliability, and invariance. We recommend using the scale applied to different samples of teleworkers and research with other organizational or individual variables.

Keywords: managerial support; scale; support; teleworking.

Escala Breve de Suporte Gerencial ao Teletrabalhador

Resumo

O teletrabalho compulsório atingiu trabalhadores em diversos países, aumentando a preocupação com o suporte gerencial. Este estudo objetivou construir e apresentar evidências de validade da Escala Breve de Suporte Gerencial ao Teletrabalhador. Foram realizadas quatro etapas sucessivas, a saber: adaptação, ao contexto do teletrabalho, de itens pertencentes a escalas de suporte ou construtos correlatos; análise fatorial exploratória e análise de redes ($N = 3.769$); análise fatorial confirmatória ($N = 3.839$); análise de invariância considerando gênero e escolaridade ($N = 7.608$). A escala possui estrutura unifatorial com cinco itens e indicadores psicométricos muito favoráveis em termos de validade, confiabilidade e invariância. Recomenda-se o uso da escala em diferentes amostras de teletrabalhadores e para investigações conjuntas com outras variáveis organizacionais ou individuais.

Palavras-chave: apoio gerencial; escala; suporte; teletrabalho

Escala corta de apoyo gerencial para teletrabajadores

Resumen

El teletrabajo obligatorio ha afectado a los trabajadores en varios países, aumentando la preocupación por el apoyo de los directivos. Este estudio tuvo como objetivo construir y presentar evidencias de validez de la Escala Corta de Apoyo Organizacional a Teletrabajadores. Se realizaron cuatro pasos sucesivos, a saber: adaptar ítems de otras escalas de apoyo organizacional o constructos relacionados al contexto del teletrabajo; análisis factorial exploratorio y análisis de redes ($N = 3.769$); análisis factorial confirmatorio ($N = 3.839$); análisis de la invariancia considerando género y escolaridad ($N = 7.608$). La escala posee de una estructura unifactorial con cinco ítems e indicadores psicométricos altamente favorables en términos de validez, confiabilidad e invarianza. Se recomienda el uso de la escala en diferentes muestras de teletrabajadores, y para investigaciones con otras variables organizacionales o individuales.

Palabras clave: apoyo organizacional; escala; apoyo; teletrabajo.

The COVID-19 pandemic has caused significant transformations in ‘people’s lives and the world of work (International Labour Organization [ILO], 2020; Kniffin et al., 2021). Many people were placed on compulsory remote work and temporarily turned their

homes into offices. A survey of 229 management leaders in April 2021 found that nearly 50% of companies had 81% or more of their employees’ telecommuting during the pandemic and that many planned to continue in the future. If telecommuting - at least partial

telecommuting - previously affected 30% of the workforce worldwide, it is predicted to reach 41% after the pandemic (Gartner, 2020).

Before the pandemic, remote work as a flexible modality had already been adopted in Brazil and worldwide (Abbad et al., 2019). However, physical and mental health were still infrequent topics in studies on the area, and isolation and lack of social contact were negative factors that required interventions to be overcome. Social support in this context improved relationship levels and increased the chances of having healthy teleworkers (Mishima-Santos et al., 2020).

In the study conducted by Abbad et al. (2019), teleworkers perceived less decision autonomy, variety, meaning, task identification, complexity, problem-solving, and specialization compared to face-to-face workers. So, there is a need for managers who work with remote work to review their support and management practices. Moreover, if the characteristics of remote work already demanded new practices from managers, its implementation on an emergency basis brought even more significant challenges because the pandemic affected the routines and generated stress or exhaustion in workers. However, it is known that supportive-oriented management practices in uncertain contexts contribute to higher engagement and lower burnout scores (Acuña-Hormazabal et al., 2021).

In the various professional categories that had to join telecommuting suddenly and compulsorily, work and interactions with management and staff became remote, requiring a set of coping strategies from workers (Kniffin et al., 2021; Lee, 2021). Leadership, in turn, had to review the distribution and accomplishment of goals and deadlines. It was up to managers to set shared goals, monitor resource consumption, anticipate potential problems, and track the work progress of each member of their team (Sandall & Mourão, 2020). The stressful situations experienced by workers in the pandemic (ILO, 2020) demanded more outstanding organizational and managerial support.

Thus, the role of leadership in this challenging context has gained even greater centrality (Dirani et al., 2020). Leaders exert great influence over their subordinates, and 'managers' encouragement of 'workers' autonomy and ability to reflect can positively affect their development and performance (Mourão, 2018). However, excessive control by bosses, with constant checking on employees or their performances, conveys a sense of distrust (Richardson, 2010) that affects 'workers' psychological security and the bond they establish with the organization (Lee, 2021).

Not only employees but leaders also need to develop competencies to deal with the new working relationships during and after the COVID-19 pandemic. Leaders must respond promptly to changes derived from times of crisis by adjusting their competencies to improve communication processes; ensure employee access to technology; prioritize 'employees' emotional stability; maintain attention to organizational goals and financial health; and promote organizational resilience (Dirani et al., 2020).

This performance of leaders is directly associated with organizational support theory, in which employees perceive the 'organization's support as a concern for their social well-being and appreciation of their contributions. This perception is formed from the treatment the employee receives in the organization. Organizational support theory is based on social exchange theory (Blau, 1964), which is characterized as a social psychology perspective whose central tenet is that interaction between individuals is based on trying to maximize rewards and reduce costs. In other words, people maintain interactions because they consider them to have some benefit/reward, whether in material or non-material terms.

In seminal studies on perceived organizational support, Eisenberger and colleagues (1986) assessed 'employees' beliefs about the support received from their organization. Perceived support would be positive when they displayed a consistent assessment that organizational actions demonstrate concern for their well-being. Early studies on perceived organizational support associated it with reduced absenteeism and greater employee commitment to the organization, based on the theory of social reciprocity.

According to Gouldner (1960), the norm of reciprocity is taught as a moral obligation and describes the development of mechanisms for exchanging what is perceived as mutually beneficial. Thus, the underlying theory of organizational support indicates a social and reciprocal exchange: 'employees' commitment to the organization increases as they perceive the 'organization's commitment to them. When workers perceive greater organizational support, they tend to have a higher affective attachment to the organization and effort to meet organizational goals (Eisenberger et al., 1986).

With the advances of this theory, social support from co-workers and managers became embedded in the social support environment, playing an instrumental role in the intrinsic value of psychological safety and as a central element for worker engagement (Singh

et al., 2018). Supervisors play a significant role in providing guidance, care, and feedback to subordinates regarding their work tasks (Eisenberger et al., 2002). As discussed in organizational support theory, treating employees well makes a difference in 'workers' returns to the organization (Shanock et al., 2019). The exchange of resources between leaders and subordinates includes tasks, information, open communication, shared goals, flexibility, feedback, ideas and decisions, creating a sense of psychological security (Lee, 2021).

In a meta-analysis of 558 studies on organizational support theory, Kurtessis et al. (2017) identified that predictions about perceived organizational support were confirmed and pointed to employee orientation toward the organization and work, employee performance, and employee well-being as its main antecedents. The most robust antecedents, on the other hand, were the 'organization's context, human resource practices, working conditions, and leadership. How supervisors are treated also affects 'subordinates' perceived organizational support, since supervisors who feel supported by the organization tend to treat their subordinates well (Shanock et al., 2019).

In the context of remote work, the support by managers becomes even more relevant, either due to the moment of crisis of the pandemic, or due to the difficulties of workers with the self-management of their performance, with processes of learning new skills, and renegotiation of work goals (ILO, 2020; Kniffin et al., 2021). In such a context, managers had to be dynamic, reorganizing work routines and adapting to the new demands from workers and the organization (Dirani et al., 2020).

Indeed, leaders have a relevant role in developing their subordinates and supporting them to adequately perform their activities at work (Mourão, 2018). In this sense, we understand that leadership must act on two simultaneous fronts: focus on results and focus on people, so that leaders can provide the necessary support to their subordinates in terms of feedback on performance, demonstration of concern for the fulfillment of work tasks and also for the well-being of subordinates (Mourão et al., 2016).

A study conducted with Chinese teleworkers showed that social support, job autonomy, monitoring, and work overload are directly related to well-being in remote work in the context of the COVID-19 pandemic (Wang et al., 2021). In the study mentioned above, social support and autonomy acted as work resources that contributed to telework management,

while work overload and monitoring acted as demands that affect 'teleworkers' well-being. Such elements are directly related to managers' performance since they determine the degree of autonomy given to workers, the goals that may or may not lead to overload, and the monitoring of the completion of tasks and goals (Sandall & Mourão, 2020).

Thus, having a scale of managerial support for the teleworker is relevant, since reconciling productivity and mental health of workers is a demand not only for the period of social isolation caused by the pandemic but also for future work relationships since many of the remote practices introduced in this period tend to continue (Gartner, 2020; Kniffin et al., 2021). However, such practices differ from in-person work environments (Sandall & Mourão, 2020). Therefore, it is essential to have measures to assess manager support for the teleworker, understood as a central element for worker performance and health (Kniffin et al., 2021).

Given the above, the purpose of this study was to construct and present initial evidence of the validity of a small scale of managerial support for the teleworker. Our option was to develop, from the adaptation of existing instruments, a short scale on this support that would allow us to evaluate the construct and other variables. In the field of Psychology, interest in developing short scales has grown considerably in recent years, including for measures of traits, which are typically long (Romero et al., 2012).

Short scales have also been used in organizational research because the more variables added for measurement, the greater the likelihood of fatigue, boredom, and overwhelm for participants, thus reducing data quality. Schweizer (2011) confirms the trend of using short scales, having reviewed the *European Journal of Psychological Assessment* in 2010 and pointed to a number of published scales that include only five or even four items. The author argues that a greater degree of homogeneity is expected from these scales compared to those composed of a minimum of 10 to 12 items.

Therefore, a brief scale of managerial support for the teleworker may contribute to contemporary literature on the subject, allowing comparisons across different professional categories. Having few items, the scale allows investigations that contemplate a greater number of antecedent and consequent variables related to the construct, especially considering the scope of the reciprocity norm (Gouldner, 1960). In addition, the scale may be helpful for assessing the results of leadership development interventions and measuring the support perceived by employees over time.

Thus, in the present study, we explored the factor structure, the internal consistency, and the invariance of the Brief Scale of Managerial Support to the Teleworker (*Escala Breve de Suporte Gerencial ao Teletrabalhador* – EBSGT), by using four sequential steps. The first consisted of constructing the measure from the adaptation of items from other scales. The second referred to exploring the structure, using Exploratory Factor Analysis (EFA) and network analysis. The third step included Confirmatory Factor Analysis (CFA). Finally, in the last step, we performed an invariance analysis for the variables sex and level of education.

Testing the invariance of the EBSGT allows the measure to be employed in future studies that compare the perceptions of male and female workers from different educational backgrounds. This gender invariance is important, since women and workers with lower levels of education are usually disadvantaged in labor relations (Barros & Mourão, 2018; M. I. C. Ferreira & Pomponet, 2019), with worsening inequalities in the pandemic period (Collins et al., 2021). Finally, we presented the method and the results and discussion for each of the four steps and a section of final considerations for more significant order.

Step 1 – Building the Scale

Qualitative analysis is an important step for the development of a scale. To support the development of the items, the following scales were analyzed: Perception of Organizational Support (Oliveira-Castro et al., 1999); Organizational Support at Work (Siqueira & Gomide Junior, 2009); Social Support at Work (Siqueira & Gomide Junior, 2009); Perception of Organizational Support Scale - reduced version (Queiroga et al., 2015); and Leadership Styles Hetero-Assessment Scale (Mourão et al., 2016).

We also analyzed the constitutive definition of the core concepts of the measure, as this contributes to its theoretical understanding and allows a more consistent discussion of the results when the scale is applied. The core concepts considered for the construction of the EBSGT items were: feedback, goal (assignment and follow-up), support and guidance, well-being, and infrastructure. The constitutive definition of feedback is: information about the difference between the actual and the desired level of performance, which allows the implementation of corrective actions capable of eliminating this difference (Ramaprasad, 1983).

As far as goals are concerned, they gained greater relevance with the Goal Orientation Theory, which goes

beyond the content of what people are trying to achieve (goals, specific standards). The theoretical emphasis here is on why and how people try to achieve goals, thus referring to broader goals of achievement behavior (Kaplan & Maehr, 2007). This theory encompasses both the process of assigning goals and their follow-up.

Support and guidance are theoretically linked to supervisor support, which refers to contributions and guidelines from the manager and influencing behaviors in the work context (Eisenberger et al., 2002). However, excessive guidance and monitoring from managers characterize micromanagement, which causes psychological insecurity in the worker (Richardson, 2010).

Well-being at work, in turn, can be understood as a multidimensional psychological construct, integrated by positive affective bonds with the job and the organization (Mishima-Santos et al., 2020) and have a clear association with ‘workers’ health (Siqueira & Gomide Junior, 2008). For Paschoal and Tamayo (2008), well-being at work can be conceptualized as the prevalence of positive emotions and the ‘individuals’ perception that, at work, they express and develop their potentials/abilities and advance in achieving their life goals. Finally, the theoretical basis for infrastructure focuses on structural elements present in the locus of production that characterize the physical environment, instruments, equipment, raw materials, and institutional support (Ferreira & Mendes, 2009).

Identifying the constitutive definitions and measures that inspired the scale items highlight the theoretical background of this study. This background is a crucial aspect because assessing content validity and internal structure has been considered the most critical scale property (Schweizer, 2011). Table 1 presents the items included in the first version of the EBSGT, the code adopted for each item in the statistical analyses, the associated core concepts, and the items of other scales that inspired the adaptation to the telework context.

After the choice of items, the judges analyzed the content. Participants in this step included civil servants from the area of People Management of two public institutions with previous experience in teleworking, and Masters and PhDs in Psychology linked to three graduate courses. In this stage, there were six items and one of them was removed from the scale, due to a lack of consensus among the judges. Most experts considered that the focus of this item was on material support. The content of this item was: “My manager is concerned about the adequacy of my infrastructure to work”. These judges also argued that this item measured

Table 1.

Items from the EBSGT

Concept, code and scale item	Items from the scales used as inspiration
<i>Constructive feedbacks</i> [Feedback] I get constructive feedback from my manager about my performance in remote activities, pointing me to opportunities for improvement.	This organization avoids criticizing employees for minor faults, highlighting the positive aspects of their performance more than the negative ones (Queiroga et al., 2015); My leader emphasizes the importance of each 'employee's performance (Mourão et al., 2016); takes steps to remedy difficulties to effective performance (Oliveira-Castro et al., 1999).
<i>Compatible goal assignment</i> [Goal (assignment)] The remote work goals assigned to me by my manager are compatible with the workload of my unit.	The organization where I work often sets unattainable goals (Queiroga et al., 2015); the employee knows the expected performance goals; the organization subjects the employee to an excessive workload (Oliveira-Castro et al., 1999).
<i>Support and guidance for tasks</i> [Guidance] I receive support from my manager when I ask for guidance to perform tasks remotely.	In this organization, the employee receives all the guidance and information for the effective execution of their activities (Queiroga et al., 2015); Provides information for the effective execution of tasks; Provides technical guidance to the employee (Oliveira-Castro et al., 1999).
<i>Goal tracking</i> [Goal (follow-up)] My manager tracks the achievement of work goals.	My leader is concerned with getting the job done; My leader monitors the results of each employee's work (Mourão et al., 2016); My leader maintains coherence between guidelines, goals and actions (Oliveira-Castro et al., 1999).
<i>Health and welfare of subordinates</i> [well-being] My manager demonstrates concern for my health and well-being.	My leader cares a lot about the well-being of his subordinates (Mourão et al., 2016); This company really cares about my well-being (Siqueira & Gomide Junior, 2008)
<i>Infrastructure for work</i> [Infrastructure] My manager is concerned about the adequacy of my infrastructure to work in.	Provides the equipment necessary for an effective performance; provides sufficient supplies (Oliveira-Castro et al., 1999); In the company where I work, the equipment is always in good condition (Siqueira & Gomide Junior, 2008).

aspects for which the immediate supervisor may not always have the autonomy to act. For this reason, after this first step, five items remained in the EBSGT.

Step 2 - Defining the Scale Structure

Method

Participants

The sample of the initial exploration of the internal structure of the EBSGT was by convenience and included 3,769 civil servants from 95 public institutions that adopted telework during the COVID-19 pandemic. These institutions comprise 93 organs of the District Executive Branch and two federal institutions, including the Union Public Prosecution Service and the Federal Judiciary Branch. Among

the 'District's bodies, there is a great diversity of sectors contemplated, such as regional administrations; regulatory agencies; public banks; public companies; foundations; state secretariats (Economy, Education, Health; Institutional Relations; Labor; Government Relations; Environment; Tourism; Transportation and Mobility; Youth; Women; among others); extraordinary Secretary for the Disabled; Public 'Attorneys' Office; 'Governor's Office; civil and military Police; Office of the Comptroller General of the Federal District, and the Office of the Attorney General of the Federal District; among other units. Due to the plurality of types of organizations surveyed, the nature of the workers' activities was also quite varied.

There was a predominance of women participants (60.2%), and the most frequent age groups were 38 to 47 years (34.6%) and 28 to 37 years (29.9%). Participants

who were married or lived in stable union (63.7%) and those with graduate (60.9%) or undergraduate (32.9%) degrees prevailed. Most participants (58.3%) had no previous experience with telecommuting. Regarding the geographical distribution, 25% of the sample was distributed in 22 states from the five Brazilian regions. All the rest were civil servants physically stationed in the Federal District.

Procedures

The data collection instrument was the one described in Step 1. From April to June 2020, data collection occurred online from links generated by the researchers and forwarded by the institutions. Only after accepting the Informed Consent Form were the questionnaires released. This term presented the research objectives and the researchers responsible, besides ensuring the participant the confidentiality of individual responses and the freedom to interrupt participation at any research stage.

All data analysis were performed in R version 4.0.4. using the Psych package for the EFA and the Qgraph package for network analysis. The latter is an innovative technique in exploring psychological phenomena and provides indicators and graphical representations that help understand the structure and relationships of psychological variables from psychometric parameters (Golino & Epskamp, 2017).

The adequacy of the data to the assumptions for the EFA was assessed using the Kaiser-Meyer-Olkin (KMO). Bartlett’s test of sphericity was not adopted due to sample size. The factor retention criteria were parallel analysis and network analysis (Golino & Epskamp, 2017). Since this is a psychological phenomenon, we opted for a polychoric correlation matrix.

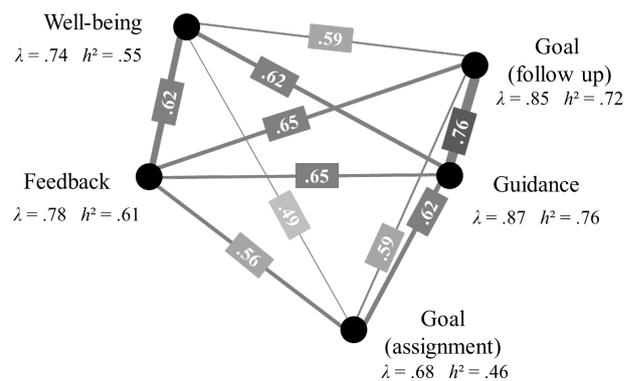
Network analysis was used to identify the dynamics of the relationships between items, allowing for a better understanding of their underlying structure (Golino & Epskamp, 2017). This method enables the extraction and estimation of factors while controlling overfitting, constraining partial correlations of low magnitude to zero. As a result, there is better handling of multicollinearity and spurious item correlations. From this process, the regularized partial correlation matrix is represented by a network whereby items are represented by vertices (nodes) and their connections by edges (lines; Epskamp et al., 2012). The association between two nodes can be observed by the edge connecting them, with the positioning of items either closer or further apart depending on their correlation.

Results and Discussion

The polychoric correlation matrix of the items met the assumptions of the EFA since the KMO was 0.87, and a single factor was extracted, with an associated eigenvalue of 3.66, which explained 61% of the variance in the perception of management support to the teleworker. Factor loadings ranged from 0.68 to 0.87, with a mean of 0.78 (SD = 0.08) and communalities from 0.46 to 0.76 (Figure 1). The item “I receive support from my manager when I request guidance to perform tasks remotely” showed the highest explanatory power of Managerial Support to Teleworker. In the exploratory approach, it was verified that the items share reasonable variance, form an underlying structure and have internal consistency with Cronbach’s alpha of 0.86.

The analysis of the polychoric correlation matrix showed that the items correlated significantly with each other ($p < 0.001$), with bivariate correlations above 0.50, except for the relationship between the item of shared goal setting and the item of perception of the ‘manager’s concern for the ‘subordinates’ well-being, whose correlation magnitude was 0.49. The thickness of edges represents the magnitude of positive correlations between items, so the thicker the line, the stronger its association. The distribution of variance among the items was from 24.0% to 57.7% (Figure 1).

The graphical analysis of Figure 1 shows the one-factor structure and the more peripheral position of Item Goal (assignment) - representative of a lower



Note. N = 3,769. Factor structure ($\alpha = 0.86$); λ = factor loadings; h^2 = commonality; Psych package, 1000 iterations. Gray rectangles contain the polychoric correlation coefficients.

Figure 1. Factor network, factor scores and coefficients from the polychoric correlation matrix of the EBSGT

variance shared with the other items of the EBSGT. The fact that the item “The remote work goals assigned to me by my manager are compatible with my ‘unit’s workload” shared a more minor variance with the others may be associated with a difficulty in setting shared goals (Kaplan & Maehr, 2007). In the period of emergency remote work, goal setting/renegotiation has become essential (Dirani et al., 2020; Kniffin et al., 2021; Sandall & Mourão, 2020) but has not always managed to be incorporated by managers. In this sense, this variable has gained its own contours, requiring managers to quickly adapt to the new demands of both workers and the organization (Dirani et al., 2020).

To further the understanding of the empirical structure of the EBSGT, three indices of item centrality will be discussed: connectivity – refers to the degree to which an item mediates with others; proximity - represents the ability of an item to mediate the shortest path between two other items and the geographical proximity of an item to others; and degree of strength – comprises the modular sum of the associations of a vertex (node representing the items) with the other vertices in the system (Epskamp et al., 2012). Figure 2 points out the graphical results of these three indices.

According to the analysis of the degree of strength, it is possible to observe that the nodes related to the items “I receive support from my manager when I request guidance to perform tasks remotely” and “My manager monitors the achievement of work goals” have a high probability of positively influencing the adjacent nodes. It happens because they are the ones that have a more shared correlation with the

other items of the network. Conversely, the item “The remote work goals assigned to me by my manager are compatible with the workload of my unit” has a lower probability of influencing the adjacent nodes, corroborated by its insular position in the network. Thus, the item “I receive support from my manager when I request guidance to perform tasks remotely” is the one that best reflects the central idea of the measure, while the goal set by the boss is least aligned with the idea of managerial support.

The analysis of proximity, in turn, indicates that the items “I receive support from my manager when I ask for guidance to perform tasks remotely” and the item “My manager monitors the achievement of work goals” have the highest values, denoting their proximity to the other items. This data reinforces the theoretical alignment of these items with the managerial support of the teleworker. This is also justified by correlation since they have the highest correlation in the data matrix (0.76, with a 57.7% shared variance). The item “The remote work goals assigned to me by my manager are compatible with the workload of my unit” is the item that has the lowest proximity index, being located in the sparsest region of the network. It denotes that the topic “goal setting” is the least associated with the other items of managerial support to the teleworker, which was corroborated by the lowest factor loading of the items in this scale (0.49).

In the same sense, the connectivity analysis also points out the item “I receive support from my manager when I ask for guidance to perform tasks remotely” as central in the data matrix. With this, we can verify that the general guidance of the manager plays a primary role in the perception of managerial support to the teleworker. Overall, the network analysis results are in line with the meta-analysis by Kurtessis et al. (2017) that signals that perceived support relates to employee performance and employee well-being at work.

Step 3 - Confirmation of the Scale structure

Method

Participants

A second sample was used for the CFA. The institutions included were the same used in Step 2. This sample was composed of 3,839 civil servants, with a predominance of women (58.3%). The most frequent age groups were 38 to 47 years old (33.9%) and 28 to 37 years old (29.7%). Participants who were married or

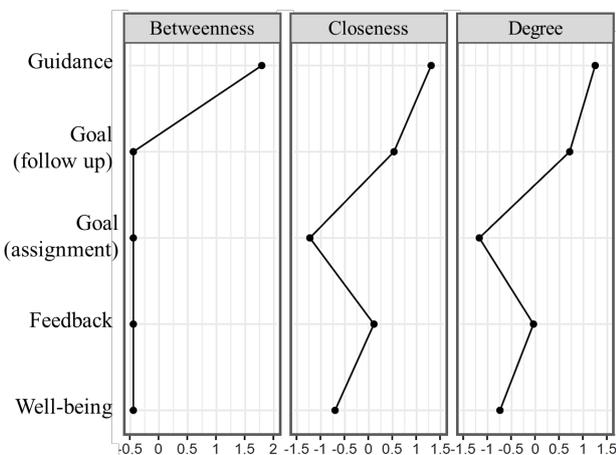


Figure 2. Centrality measures of EBSGT items

lived in stable union (63.3%) and with graduate (60.1%) or undergraduate (33%) degrees prevailed. Those who already had previous experience with telecommuting corresponded to 42.1% of the sample. The civil servants located in the Federal District corresponded to 70.9% of the respondents, and the rest were distributed in 22 Brazilian states, in the five Brazilian regions.

Procedures

In the data collection of this research stage, the procedures previously described were maintained. To confirm the internal structure of the EBSGT, the data were analyzed in R using the Lavaan package (Rosseel, 2012), with the robust Unweighted Least Squares Mean and Variance-Adjusted (ULSMV) estimation method. In the CFA, we chose to present ‘McDonald’s Omega as a reliability index (minimum parameter of 0.70). For the analysis of model fit, the following criteria were adopted CFI (> 0.90), TLI (> 0.90), RMSEA (< 0.08), and SRMR (< 0.08; Brown, 2015).

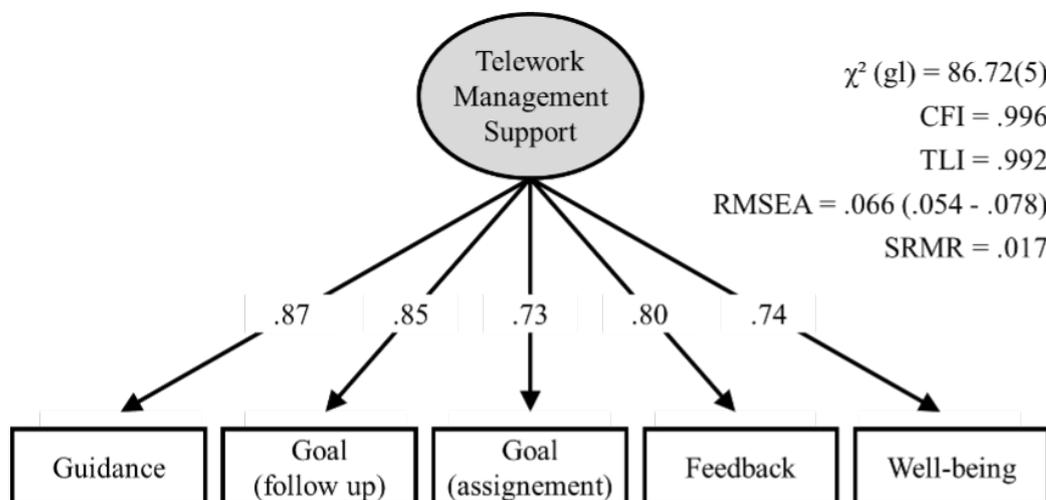
Results and Discussion

The CFA confirmed that the one-factor structure fits the polychoric correlation matrix of the items, with good fit and reliability indices (Brown, 2015). All factor loadings of the measurement model were greater than 0.70 (Figure 3), indicating high correlations between the

original variables and the factor of perceived Managerial Support to Teleworker. The chi-square was significant and high ($\chi^2 = 86.72$), which can be explained by the large sample size. Nevertheless, the CFI and TLI indicators of 0.99 indicate a perfect fit of the data to the hypothesized model. The RMSEA, as a measure of a discrepancy, indicated that the model is parsimonious. The SRMR, as an absolute measure of fit, presented the standardized difference between the observed and predicted correlation and was of low value (0.017), confirming the fit of the data to the model.

The results of the CFA confirm the internal structure of the EBSGT, with the five items focused on feedback, goal (assignment and follow-up), support and guidance, and well-being. Therefore, the measure corroborates these concepts for the assessment of Managerial Support to Teleworkers, consistent with the literature and with measures of organizational support (Oliveira-Castro et al., 1999; Queiroga et al., 2015), social support at work (Siqueira & Gomide Junior, 2009) and leadership styles (Mourão et al., 2016).

This result is important because the adaptation of leadership styles for telework will be an essential research topic for the pandemic and post-pandemic period (Dirani et al., 2020; Kniffin et al., 2021). Furthermore, the fact that a parsimonious structure with a reduced number of items has been confirmed makes it feasible to research ‘managers’ support for telework concerning organizational practices and other variables,



Note. All factor loadings $p < 0.01$; χ^2 = chi-square; g/l = degrees of freedom; CFI = Comparative Fit Index; TLI = Tucker Lewis Index; RMSEA = Root Mean Square Error of Approximation; SRMR = standardized residual mean square root

Figure 3. One-factor management support model for teleworkers with standardized loads

such as autonomy and work overload, burnout, engagement, and physical and emotional well-being of teleworkers (Acuña-Hormazabal et al., 2021; Mishima-Santos et al., 2020; Wang et al., 2021).

Step 4 - Invariance of Scale

Method

Participants

For the invariance tests, we considered the sample of civil servants from the two previous steps, and

were adopted; and for the confirmation of invariance $\Delta CFI (< 0.01)$ (Putnick & Bornstein, 2016).

Results and Discussion

Table 2 presents the parameters of the CFAMG that indicate configurational invariance for both gender and education level. It was also shown, for these groups, that the EBSGT is invariant concerning factor loadings (metric), intercepts (scalar), and item errors (residual). These results ensure that the factorial scores obtained by the latent variable in the

Table 2.
EBSGT Multigroup Confirmatory Factor Analysis

Gender Invariance	RMSEA (90%)	TLI	CFI	ΔCFI
Configuration Model (Unrestricted)	0,07 (0,06 – 0,08)	0,99	0,99	-
Metric Invariance	0,03 (0,02 – 0,04)	0,99	0,99	0,003
Scalar Invariance	0,02 (0,01 – 0,03)	0,99	0,99	0,001
Residual Invariance	0,02 (0,01 – 0,03)	0,99	0,99	0,001
Schooling Invariance	RMSEA	TLI	CFI	ΔCFI
Configuration Model (Unrestricted)	0,07 (0,06 – 0,08)	0,99	0,99	-
Metric Invariance	0,03 (0,02 – 0,04)	0,99	0,99	0,004
Scalar Invariance	0,02 (0,01 – 0,03)	0,99	0,99	0,001
Residual Invariance	0,02 (0,01 – 0,03)	0,99	0,99	0,001

Note. RMSEA = Root Mean Square Error of Approximation; TLI = Tucker Lewis Index; CFI = Comparative Fit Index; ΔCFI = CFI difference.

the category sex was separated into men ($n = 3,095$; 40.7%) and women ($n = 4,508$; 59.3%). Education was divided into four categories: high school ($n = 503$; 6.6%); undergraduate ($n = 2,506$; 32.9%); *lato sensu* graduate ($n = 4,006$; 52.7%); and *stricto sensu* graduate ($n = 593$; 7.8%).

Procedures

After the CFA, the Confirmatory Factor Analysis Multigroup (CFAMG) was performed to verify the invariance of the measure in terms of sex and education. In this step, the analysis procedure took into account hierarchical tests. Thus, starting from the configural model (unrestricted), more restricted models - metric, scalar, and residual - were successively compared. For the analysis of model fit, the criteria CFI (> 0.90), TLI (> 0.90) and RMSEA (< 0.08 ; Brown, 2015)

compared groups are related to the level of the latent trait of the participants.

This confirmation of the sex and education grade invariance of the EBSGT indicates the robustness of the measure for comparative studies of the perception of managerial support to teleworkers by sex and education. This result is relevant since during the COVID-19 pandemic, inequality was reproduced, with cut-offs by sex and schooling (Barros & Mourão, 2018; Collins et al., 2021; Ferreira & Pomponet, 2019).

Final Considerations

The present study aimed to build and present initial evidence of the validity of the EBSGT. The measure was developed from the adaptation of existing instruments, opting for a short scale that would allow

the assessment of managerial support for telework and other variables of interest. The objective was achieved since we were able to present the factorial structure, the internal consistency, and the invariance of the EBSGT. The work was developed in four successive stages, from the scale construction to the invariance of the measure (sex and education), passing by the stages of EFA and CFA.

Thus, the model with the best psychometric properties and theoretical consistency was found by the analysis of judges and using exploratory and confirmatory data analysis techniques. The result was a straightforward instrument, but it contemplates critical contents of the Managerial Support to the Teleworker: well-being, feedback, goal (assignment and follow-up), support, and guidance. The psychometric indicators were quite favorable, with high factor loadings, satisfactory internal consistency (both by 'Cronbach's alpha and 'McDonald's omega), and explained most of the variance of the perception of managerial support to the teleworker. The CFI, TLI, RMSEA, and SRMR indicators indicated a parsimonious model and optimal data fit to the hypothesized model. Finally, the CFAMG confirmed configural, metric, scalar, and residual invariance for gender and education, authorizing the use of the measure in different teleworker samples.

Despite these positive results that support recommending the EBSGT, there are limitations to be reported. The first limitation refers to the inclusion of well-being in the scale based on a single item (My manager shows concern for my health and well-being) that does not explore negative and positive affections associated with work, mentioning only the words well-being and health. In this sense, new applications of this scale could review this item and expand the scope of well-being measurement, to better fit its constitutive definition. It would also be important for further studies to retest the material support in terms of infrastructure, since this aspect shows care for the remote 'worker's working conditions. An alternative would be to reformulate the infrastructure item in order to emphasize the idea of the attention to the worker and his well-being. In this case, it would be helpful if the new item had a new wording but kept the referent in the individual. Another suggestion for future studies would be to include an explicit mention of remote work in all items, even if the scale's instructions already indicate that the items deal with the evaluation of support to the teleworker.

Another limitation of the study, as with most studies in the field, includes the self-report measurement

method. Future studies may correlate the results with other measurement methods that highlight levels of managerial support for telecommuting. Furthermore, the study did not include discriminant, convergent, or predictive validity tests. Thus, studies with the explicit intent of examining the relationship of EBSGT to external variables are indicated for further investigations.

Despite these limitations and the need for continued validity testing of the EBSGT, the results of the present study support the potential of the instrument as an effective measure to assess the support of supervisors to teleworkers. The fact that it is a blunt instrument facilitates its administration and increases the potential for large-scale cross-cultural studies, which may be useful in situations such as the current one, where the phenomenon of compulsory telework has reached workers in several countries.

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