

## THE CHILEAN PUBLIC SECTOR: A HEALTHY AND RESILIENT ORGANIZATION. ADAPTATION AND VALIDATION OF THE HERO CHECK PUBLIC INSTRUMENT WITH A GENDER PERSPECTIVE

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The aim of this study is to test the psychometric properties of the HERO (Healthy & Resilient Organization; Salanova et al., 2012) Check Public questionnaire in a Chilean sample, testing the psychosocial factors and healthy organizations through 29 single items and six dimensions based on the HERO model. The final sample was composed of workers ( $N = 1,188$ ) and immediate supervisors ( $N = 155$ ). The results showed that the 6-factor model has high reliability and structural validity on the worker's sample. It demonstrates robust configural invariance supporting its use among workers regardless of participant's gender. However, for supervisors, these results are not conclusive. Additionally, the lack of metric invariance by gender underscores the need for careful consideration of the factors comprising the assessment of psychosocial factors and healthy organizations. These findings highlight the importance of context- and gender-sensitive tools to promote healthy and inclusive environments in Chilean public administration.

Keywords: Psychosocial risks; Chilean public sector; HERO model; Gender; Mono item.

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The World Health Organization (WHO, 2021) notes that the determinants of health and mental disorders are multifaceted, encompassing individual and contextual factors such as national policies, social protection, and working conditions. Psychosocial factors and risks linked to work play a significant role in mental health issues (Harvey et al., 2017; Milner et al., 2017). In this context, Saint-Martin et al. (2018) highlights that musculoskeletal and mental disorders continue to be the main causes of work absences,

disability, and early retirement, emphasizing the importance of addressing both individual and contextual aspects to actively promote a workplace environment that enhances mental health and well-being.

In Chile, according to the Superintendencia de Seguridad Social [Superintendency of Social Security] (2023), the number of medical leaves in 2022 increased by 14.7% compared to 2021, with a predominance of mental disorders, accounting for 29.7% of the total. Of these leaves, 64.51% were requested by women, underscoring the need to examine the impact of working conditions on the mental health of this group. Furthermore, 15.95% of these leaves were from public sector workers, who make up 12% of the total employment according to the Organization for Economic Cooperation and Development (2020). The increase in sick leaves due to mental health issues in Chile highlights the need to effectively address psychosocial work factors and risks, with an emphasis on the public sector and a gender perspective.

### The Job Demands-Resources (JD-R) Theory

The Job Demands-Resources (JD-R) theory by Bakker and Demerouti (2013) is presented as a unifying theory of job design, combining motivational and work stress perspectives (Bakker et al., 2023). This theory categorizes job characteristics into demands and resources. Demands include physical, psychological, social, and organizational aspects that require effort and have physiological and psychological costs (Demerouti et al., 2001), while resources are those components of work that help reduce the impact of these demands and promote goal achievement and personal development (Bakker & Demerouti, 2017; Bakker et al., 2014). According to Bakker and Demerouti (2017), demands and resources trigger two processes: the health impairment process, and the motivational process. Demands are key predictors of burnout and psychosomatic issues, while resources positively influence job satisfaction, motivation, and engagement. However, both can interact to affect health, well-being, and performance (Bakker et al., 2005). More recently, personal resources such as optimism, self-efficacy, and resilience have been integrated into the model, interacting with work resources to affect workplace dynamics (Bakker & Demerouti, 2017; Bakker et al., 2023).

### Consideration of Gender Differences in the Perception of Job Demands and Resources

Research has demonstrated that men and women perceive job demands and resources differently, and that women tend to be more exposed to psychosocial risk (Ansoleaga et al., 2016; Cifre et al., 2011; Purvanova & Muros, 2010), making it necessary to have gender-sensitive assessment tools to identify and mitigate occupational psychosocial risks, thus promoting healthier and more inclusive workplaces. Pérez-Franco (2014) examines psychosocial risks in Chile, highlighting areas such as social security compliance, wage dissatisfaction, and domestic workload, with women being more adversely affected. The study emphasizes the need for policies to mitigate these risks and enhance workplace equity. The study by Conesa Carpintero and González Ramos (2018) highlights that in academia, high-demand practices and expectations of total availability differentially impact genders: they hinder professional advancement for women due to unrecognized caregiving responsibilities, and constrain men's involvement in family care, perpetuating a traditional male work model. According to Kowalczyk et al. (2018), it was discovered that men in Poland evaluate psychosocial risks in nursing more negatively than women. This more negative perception significantly contributes to their lower representation in this profession, highlighting a major gender-based disparity in the field.

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## Healthy and Resilient Organization (HERO) Model

Another model that contributes to understanding health in the workplace context from a positive approximation and focused on the motivational process is the Healthy and Resilient Organization (HERO) model, developed by Salanova et al. (2012), which aligns with Bakker and Demerouti's (2013) JD-R theory. Both models emphasize the importance of balancing demands and resources in the work environment to enhance well-being and performance. In contrast the Bakker and Demerouti theory, which focuses on demands, work resources, and personal resources, the HERO model incorporates healthy organizational practices and outcomes, and grounded in Positive Organizational Psychology, defined as the scientific study of optimal functioning of individuals and organizations, as well as the effective management of psychosocial well-being at work and the development of organizations to make them healthier (Salanova et al., 2016, p. 41). It conceptualizes healthy and resilient organizations through three interconnected factors. The first factor addresses healthy organizational resources and practices, which include task and work environment aspects that support goals, reduce job demands, and stimulate personal and professional development (e.g., autonomy). Healthy organizational practices are strategies designed to promote health, well-being, and performance. The second factor, healthy employees, refers to the alignment between resources and job demands that generate psychosocial well-being and contribute to positive work performance. Finally, healthy organizational outcomes focus on performance and the quality of products/services. The interaction between these factors fosters a reciprocal dynamic, as optimizing resources and healthy organizational practices contributes to healthier employees, yielding extraordinary organizational outcomes (Acosta-Antognoni et al., 2013; Llorens et al., 2017; Salanova et al., 2012).

The HERO model is grounded in theories and studies that include the Job Demands-Resources theory, Albert Bandura's Social Cognitive theory, Steven Hobfoll's Conservation of Resources model, and Barbara Fredrickson's Broaden-and-Build theory of positive emotions, as well as research by Wilson and DeJoy (Salanova et al., 2016). It was validated through two studies in small and medium-sized enterprises across various sectors in Spain. The first study provided psychometric support through semi-structured interviews with CEOs and surveys from employees, supervisors, and customers in 14 companies. The second study used structural equation modeling and regression analysis at the team and the organizational level, revealing that healthy employees (well-being variables) play a crucial role in mediating the positive relationship between healthy organizational resources and practices and healthy organizational outcomes, as assessed by supervisors. Moreover, high employee performance was shown to drive customer loyalty and satisfaction, thus corroborating the effectiveness of the HERO model in fostering organizational health and performance (Salanova et al., 2012).

Based on this model, the HERO methodology was developed to assess psychosocial factors and healthy organizations. It has proven effective in evaluating organizations across both public and private sectors in various productive industries (Salanova & Soler, 2020). Given that the questionnaire comprises over 100 questions, a shortened version, known as HEROCheck, was designed. This checklist allows for a rapid initial assessment through one question per variable of the same factors (Salanova et al., 2019). Both the HERO model and the Job Demands-Resources theory seek to understand how certain elements in the work environment influence employee motivation and ultimately their well-being and performance.

## Limitations in Current Chilean Psychosocial Risk Assessment

In Chile, psychosocial occupational risks have been regulated since 2013, with employers bearing the responsibility to identify and assess these risks. Since January 2023, the CEAL-SM/SUSESO questionnaire

consisting of 140 questions has been employed. This questionnaire includes a validation of the Copenhagen Psychosocial Questionnaire (COPSOQ III), the GHQ-12 mental health scale for vulnerability at work (Sánchez-López & Dresch, 2008), and sociodemographic data queries (Pérez-Franco et al., 2022). However, the current evaluation presents some limitations that need to be addressed.

Firstly, while it is comprehensive in identifying and managing risk factors in the workplace, it primarily focuses on diagnosing and mitigating negative aspects, as indicated by its detailed structure for measuring specific dimensions of psychosocial risk (Pérez-Franco et al., 2022). Nevertheless, complementing this approach with an exploration of positive mechanisms that promote the health and well-being of workers could significantly enrich interventions, allowing not only to reduce risks but also to actively promote a healthy and resilient work environment, thereby aligning with a more comprehensive and preventive perspective of occupational health (Gonçalves et al., 2022). Addressing psychosocial factors and risks by focusing only on the negative aspects presents a biased or incomplete perspective because it does not provide a comprehensive understanding of personal, social, and organizational mechanisms that could be facilitating workers' well-being and performance (Bakker et al., 2012; Mendoza-Llanos & Moyano-Díaz, 2019). For instance, resources such as autonomy, work climate, leadership, and social support climate have been shown to be related to productivity, creativity, and the quality of performance as well as healthy organizational outcomes (Garrosa Hernández & Carmona Cobo, 2011). Secondly, the current evaluation is extensive, 140 questions (Pérez-Franco et al., 2022), considering that the available time for individuals to respond is usually limited and that fatigue can affect the quality of responses, necessitating the use of brief and comprehensible questionnaires. The use of extensive questionnaires, such as those employed in Chile, can significantly prolong data collection and analysis times. This represents a challenge, as not all institutions have ample time to address issues related to the psychosocial well-being of workers. It is often argued that the more items used to measure a construct, the easier it is to ensure its reliability (Tavakol & Dennick, 2011). Concerns regarding single-item scales indicate that they are more susceptible to measurement errors, have lower reliability and validity than multi-item scales, and cannot fully capture complex constructs (Bowling, 2005). However, several studies comparing single-item and multi-item scales have supported the use of single-item scales as robust alternatives for assessing constructs such as self-efficacy (Hoepfner et al., 2011), academic anxiety and self-concept (Gogol et al., 2014), job satisfaction (Dolbier et al., 2005), and life satisfaction (Jovanović & Lazić, 2020). Thirdly, the current evaluation does not consider specific variables of the public context. While work environments share certain characteristics, it is crucial to pay attention to their particularities. In the public sector, the impact of activities on society, government regulations, and citizen expectations impose specific job demands. Governments face multidimensional challenges, the resolution of which largely depends on the quality of management and leadership within their organizations (Gerson, 2020). In this regard, Getha-Taylor and colleagues (2011) suggest that leadership in the public sphere should be oriented toward the common good. However, this task is complicated by the complexity of the challenges, the diversity of stakeholders, the presence of conflicting values, and limited resources available. Therefore, traditional, and generic leadership models, which involve directing followers toward specific goals, are not suitable for addressing these contemporary challenges.

### Leadership in the Public Sector

A specific resource relevant in occupational health psychology is the leadership as a positive (or negative) driver of psychological well-being at the workplace. Tummers and Bakker (2021) highlight the role

of leadership in the Job Demands-Resources (JD-R) theory by Bakker and Demerouti (2013). Firstly, it directly influences job demands, job resources, and personal resources; secondly, it moderates the relationships between job resources, personal resources, and motivation, as well as the relationship between demands and stress; and thirdly, it impacts employees' ability to shape their own job roles or contribute to their deterioration.

Transformational leadership (TL) and charismatic leadership has been predominant in positive organizational research, characterized by fostering a shared vision for the future and responding to individual differences, motivating employees toward organizational goals (Yammarino & Bass, 1990). In the HERO model, the underlying leadership model is transformational leadership (TL), which is recognized as an essential social resource and plays a fundamental role in positive evaluation, contributing to the management of demands and enhancing both well-being and organizational outcomes (Salanova et al., 2012, 219). However, since the 1990s, there has been an increase in research on value-based leadership, including ethical, authentic, and servant leadership (Zhu et al., 2019). This shift in focus is due to the perception that TL is incomplete as it does not address a strong and explicit moral dimension (Hoch et al., 2018). These leadership styles fall under what is known as positive leadership, characterized by a clear concern for ethics and altruistic behaviors (Dinh et al., 2014).

Considering that positive leadership styles are closely related to TL, several studies have investigated the conceptual overlap between TL and so-called positive leaderships (Blanch et al., 2016). Hoch et al. (2018) found meta-analytical evidence of the incremental predictive validity of servant leadership (SL) over TL, distinguished by demonstrating greater autonomy and superior incremental predictive validity in variables such as civic organizational behavior, engagement, satisfaction, organizational commitment, trust in the supervisor, and leader-member exchange (LMX). Using a quantitative meta-analysis based on 130 independent studies, current research provides evidence that SL has incremental predictive validity over transformational, authentic, and ethical leadership (Lee et al., 2020).

Servant leaders adopt moral and virtuous behavior to fully develop their followers' potential, prioritizing their interests over their own (Greenleaf, 1970; Liden et al., 2008; van Dierendonck, 2011). Thanks to their ethical approach, servant leaders consider the wide range of stakeholders affected by their decisions, an aspect not explicitly present in TL. Since stakeholders play a crucial role in the public sector, SL is revealed as particularly suitable for organizations of this nature (Schwarz et al., 2016). Public sector leaders who define themselves as servant leaders tend to cultivate an enhanced work environment, resulting in higher levels of engagement among their employees (Shim et al., 2016). Among the various scales for measuring SL, the one proposed by van Dierendonck and Nuijten (2011) stands out for its theoretical and methodological rigor in the construction and validation phases. The underlying model suggests that servant leaders empower and develop people while holding them accountable for their work outcomes. These leaders adopt a humble attitude, reflected in their willingness to learn and their readiness to admit mistakes. Moreover, they show a willingness to defend their fundamental values and focus on the common good (Eva et al., 2019).

### Public Service Motivation

Another distinctive aspect of the public sector is the motivations and ethical considerations related to being a public servant. Public service motivation (PSM) is an increasingly researched concept and, at the same time, heavily debated in the field of management and public administration (Vandenabeele et al., 2018). Perry and Wise (1990) introduced the concept of public service motivation, defining it as "an individual predisposition to respond to motivations exclusive to public institutions or organizations" (p. 368). Those

with high PSM have prosocial motives, seeking to contribute to the well-being of other people and society through the provision of public services (Perry et al., 2008). Experimental evidence supports that PSM can foster ethical behavior intentions, suggesting that strengthening PSM in public sector employees can positively impact the sector's ethics (Meyer-Sahling et al., 2019). Furthermore, leadership that promotes public service values is vital to optimizing motivation and aligning employees' goals with those of the organization (Christensen et al., 2017).

An important question is whether PSM is a malleable attribute or a trait. In a review of PSM research from 2008 to 2015 by Christensen and colleagues (2017), it is concluded that PSM is malleable and can be influenced by organizational practices. The study concludes that although PSM has a stable base formed during an individual's early years, intentional organizational interventions and work environment conditions can significantly modify it, allowing organizations to manage it to improve performance and mission fulfillment.

In the last two decades, research has revealed that public servants with higher levels of public service motivation tend to perform better compared to those with lower levels of PSM. This is because highly motivated public servants have the capacity to cope with the demands of their job and avoid burnout. Additionally, thanks to their sense of vocation, they are motivated to use their work resources to maintain high levels of commitment and performance. However, if job demands are consistently high and work resources consistently low, highly motivated public servants will deplete their psychological resources, resulting in lower PSM (Bakker, 2015).

### Purpose of the Study

The aim of this study is to evaluate the psychometric properties of the HEROCheck Public questionnaire among workers and supervisors in the Chilean public sector. This instrument assesses each variable through a single question, based on the HEROCheck questionnaire and adapted to the public context by incorporating factors such as servant leadership and public service motivation. Additionally, job demands are integrated to understand how the unique challenges of the public sector impact the productivity and health of its employees and supervisors. The inclusion of these three aspects — servant leadership, public service motivation, and job demands — represents an innovative approach to developing a concise assessment tool that considers variables relevant to the public context and integrates aspects of both psychosocial risk and positive organizational health.

Furthermore, this study aims to understand how men and women interpret the questions in the questionnaire, ensuring that gender differences are considered in the evaluation of psychosocial risks and organizational health. The current limitations in the evaluation of psychosocial risks in Chile, such as the length of the questionnaire and the lack of consideration for positive mechanisms and the specific context of the public sector, underscore the need to develop more efficient and contextualized tools. This study addresses these limitations by creating an abbreviated and adapted version of the HEROCheck questionnaire that includes relevant variables and considers gender differences.

## METHOD

### Design

The study employs a quantitative approach with a nonexperimental and correlational design, as it aims to describe variables through cross-sectional measurement and subsequently determine the degree of

existing relationships (Hernández et al., 2014). The sample is nonprobabilistic and convenience-based, selected due to the group's pertinent characteristics related to the study (Otzen & Manterola, 2017).

### Participants

To achieve the objectives of the study, a sample comprising workers and supervisors (middle management and executives) from the Chilean public sector was utilized. The response rate was 26% for workers and 27% for supervisors. In total, 11,231 public servants from 43 organizations (as detailed in the Appendix) participated, selected via convenience sampling. Inclusion criteria required participants to have some form of contract with the involved institutions.

The final sample (1,343 individuals) was divided into two groups: workers (1,188) and supervisors (155). Among the workers, 61.4% (729) were women and 38.6% (459) men. Regarding age, 32.9% (391) were under 40 years old, 37.4% (444) were between 40 and 49 years old, 23.2% (276) between 50 and 59 years old, and 6.5% (77) were 60 years or older. In terms of time in position, 56.3% (669) had been in their role for more than five years, 41.2% (489) between six months and five years, and 2.5% (30) less than six months. Regarding contract type, 70.3% (835) were on fixed-term contracts, 24.7% (293) were permanent staff, 3.9% (46) were on honorariums, and 1.2% (14) under the labor code. Educational attainment showed 57.2% (680) with a university degree, 14.4% (171) with a technical or higher degree, 22.1% (263) with a master's or doctoral degree, and 6.2% (74) with basic or secondary education. Additionally, 10.4% (124) identified as belonging to indigenous peoples.

The supervisor sample included 155 individuals from 40 public institutions, with 55.5% (86) women and 44.5% (69) men. In terms of age, 20% (31) were under 40 years old, 45.8% (71) between 40 and 49 years old, 25.8% (40) between 50 and 59 years old, and 8.4% (13) were 60 years or older. Regarding time in position, 62.6% (97) had been in their role for more than five years, and 37.4% (58) between six months and five years. Regarding contract types, 40.6% (63) were on fixed-term contracts, 55.5% (86) were permanent staff, and 3.9% (6) held senior public management positions. Educational attainment showed 52.9% (82) with a university degree, 44.5% (69) with a master's or doctoral degree, and 2.6% (4) with a technical or higher degree. Lastly, 5.8% (9) reported being part of indigenous peoples.

### Procedure

The study was conducted in collaboration with the National Civil Service Directorate, an agency under the Ministry of Finance tasked with strengthening public service and contributing to state modernization through personnel management and development. The National Civil Service Directorate invited agencies from the High Public Management System, where executives are selected through transparent competitions, to participate voluntarily. Out of 183 invited organizations, 43 agreed to participate (Appendix).

Data collection was carried out by the personnel management and development area managers of the participating organizations and supervised by the principal researcher. It took place in February and March 2021 using the Qualtrics platform. Three questionnaires were used, targeted at workers, middle management, and top executives, requesting similar but role-appropriate information.

From an ethical standpoint, an agreement was signed between the Universitat Jaume I (Spain) and the National Civil Service Directorate (NCSD) to ensure the confidentiality and appropriate use of the information solely for research purposes. Additionally, approval was obtained from the ethical committee of Universitat Jaume I, ensuring compliance with the General Data Protection Regulation of the European Union (N 2016/679). Each participant received an informed consent form detailing the research objectives and

confidentiality assurances. The questionnaires consisted of Likert-type self-reports with 29 items on perceptions of the work team, the organization, and the leadership to assess the six studied factors.

### Instruments

This study employs a brief version of the self-report questionnaires for workers and supervisors from the HERO model (Salanova et al., 2012), known as “HEROCheck.” Additionally, three essential variables for the public sector have been incorporated: (1) servant leadership, based on the Spanish version of the Servant Leadership Survey by Rodríguez-Carvajal et al. (2014), and (2) public service motivation, in the Spanish version by Meyer-Sahling et al. (2018). Job demands have also been added, an innovation to the original HERO model, allowing a more comprehensive assessment of factors affecting the productivity and health of public servants. Sociodemographic and work-related variables have also been included. Thus, the “HEROCheck Public” questionnaire is an adapted version consisting of 29 single items, distributed across six factors: job and social resources, leadership, healthy organizational practices, job demands, healthy employee, and healthy organizational outcomes (Table 1).

TABLE 1  
 Factors and variables of the HEROCheck Public questionnaire

Factors	Variables
Job and social resources	<p><i>Autonomy</i>: the degree to which individuals have enough control to decide the tasks they will perform during the day, the amount, the order in which they will carry them out, and the time they will start and/or finish them.</p> <p><i>Feedback</i>: the degree to which individuals receive information about their performance. This can come from the task itself, peers, their supervisors, and from external individuals.</p> <p><i>Supportive climate</i>: the degree to which individuals feel supported by their peers and supervisors in both their personal and professional circumstances.</p> <p><i>Coordination</i>: the degree to which individuals are coordinated with those they work with to act in work situations.</p>
Leadership	<p><i>Positive leadership</i>: the degree to which direct management considers the needs of the team under its responsibility, recognizes effort, and achieves goals. It has a future-oriented vision based on the organization’s values, contributing to motivation and trust. It also promotes viewing things from different perspectives.</p> <p><i>Servant leadership</i>: the degree to which direct management is concerned with the development of their team, empowering them, accepting differences in opinion, and giving credit were due. They also acknowledge their limitations, show their feelings, and learn from the feedback they receive. They take risks with a focus on long-term outcomes and the social responsibility of the organization.</p>
Healthy organizational practices	<p><i>Work-life balance</i>: practices to facilitate the balance between personal, family, and work life for both women and men.</p> <p><i>Prevention of mobbing</i>: practices to facilitate early detection and prevention of possible harassment situations in the institution.</p> <p><i>Skill development</i>: practices to provide training opportunities for developing the competencies and skills required for the job.</p> <p><i>Career development</i>: practices to foster career growth and promotion within the institution.</p> <p><i>Health programs</i>: practices to ensure the well-being and quality of life of individuals.</p> <p><i>Equity</i>: practices to ensure that the relationships between individuals and the institution are equitable and perceived as fair.</p> <p><i>Organizational information</i>: practices from the institution to individuals and vice versa, from staff to the institution.</p> <p><i>Social responsibility</i>: practices to facilitate the achievement of the common good of the citizens, in accordance with the mission of the institution.</p> <p><i>Equality</i>: practices to ensure equal opportunities between men and women.</p>

(table 1 continues)



Table 1 (continued)

Factors	Variables
Job demands	<p><i>Role ambiguity</i>: the degree to which individuals do not clearly perceive their function and the tasks they need to perform at work. They are unclear about what they should do, how it should be done, and why it should be done.</p> <p><i>Role conflict</i>: the degree to which individuals perceive demands or receive orders that are incompatible and contradictory to each other. Or, to perform one task, they must stop doing another.</p> <p><i>Routine</i>: the degree to which the tasks performed are noninnovative, unchallenging, repetitive, and unchanging. Additionally, they do not involve the use of various skills.</p> <p><i>Mobbing</i>: the degree to which individuals are subjected to systematic hostile and unethical communication, causing them a position of defenselessness.</p> <p><i>Emotional dissonance</i>: the degree to which they must express emotions they really do not feel or must suppress the expression of emotions they feel.</p>
Healthy employee	<p><i>Collective efficacy</i>: the degree to which they believe in the team’s capabilities to successfully carry out tasks despite obstacles.</p> <p><i>Engagement</i>: the degree to which they feel immersed, full of energy, and dedicated to their work, creating a positive atmosphere of fulfillment and enthusiasm.</p> <p><i>Public service motivation</i>: the degree to which they consider that doing meaningful public work is fundamental for them. They believe that equality of opportunity for all citizens is important as well as the ethical behavior of all public officials. They feel compassion and empathy for people with difficulties, being willing to make sacrifices for the good of society.</p> <p><i>Vertical trust</i>: the degree to which they trust the actions of their supervisors and the organization they work for.</p> <p><i>Horizontal trust</i>: the degree to which they trust the people they work with, believing in what their colleagues do.</p> <p><i>Resilience</i>: the degree to which they can emerge strengthened from adversity and failures at work.</p>
Healthy organizational outcomes	<p><i>In-role performance</i>: the degree to which individuals perform and fulfill the tasks that are part of their job responsibilities.</p> <p><i>Extra-role performance</i>: the degree to which individuals voluntarily perform tasks that exceed what is prescribed by their job.</p> <p><i>Affective organizational commitment</i>: the degree to which individuals feel committed to the organization and its outcomes, are proud to belong, and have the desire to remain there.</p>

### Data Analysis

To evaluate the internal consistency of the measure, Cronbach’s alpha ( $\alpha$ ) and McDonald’s omega ( $\omega$ ) indices were used. In addition, composite reliability (CR) and average variance extracted (AVE) were calculated. The structural validity of the HEROCheck Public for public sector workers and supervisors was examined using confirmatory factor analysis (CFA), testing three factorial structures: a unifactorial model (Model 1) to verify the simplicity of the fit (Harman, 1976); the original 5-factor model by Salanova et al. (2012), which includes healthy organizations resources and practices (i.e., job and social resources, leadership, and healthy organizational practices), healthy employees, and healthy organizational outcomes (Model 2); and a 6-factor model that adds job demands to the original model (Model 3).

The three models were assessed using fit indices for both workers and supervisors. Two absolute fit indices were evaluated: the  $\chi^2$  statistic and the  $\chi^2/\text{degrees of freedom (df)}$  ratio. Since  $\chi^2$  is sensitive to sample size, it is recommended to use goodness-of-fit indices and relative comparison indices to evaluate model fit. The root-mean-square error of approximation (RMSEA) was assessed as a goodness-of-fit index, and three relative comparison indicators were used: 1) the comparative fit index (CFI); 2) the Tucker-Lewis index (TLI), also called the non-normed fit index; and 3) the normed fit index (NFI). Additionally, the incremental fit index (IFI) was assessed as a parsimony relative index. For the  $\chi^2/\text{df}$  ratio, less than 5 is considered an adequate fit indicator (Ruiz et al., 2010). For RMSEA, values under .05 are considered

excellent fit, .08 is considered acceptable, and values above .1 indicate that the model should be rejected (Browne & Cudeck, 1993). For comparative and parsimony relative fit indices, values of .90 are considered indicators of a good fit. Lastly, configural (Model 4) and metric gender invariance (Model 5) were examined in both samples using the same fit indices. Data analysis was carried using JASP v0.17.1 (Love et al., 2019) and IBM AMOS (Version 24.0).

## RESULTS

Table 2 presents the general descriptive statistics (i.e., mean and standard deviation) for workers ( $N = 1,188$ ) and supervisors ( $N = 155$ ).

TABLE 2  
 General descriptives. Workers and supervisors

Factors	Variables	Workers ( $N = 1,188$ )		Supervisors ( $N = 155$ )	
		Mean	<i>SD</i>	Mean	<i>SD</i>
Job and social resources	Autonomy	4.53	1.33	4.97	0.84
	Feedback	3.79	1.56	4.59	1.09
	Supportive climate	4.22	1.50	4.87	1.11
	Coordination	4.69	1.23	5.06	0.94
Leadership	Positive leadership	4.07	1.65	5.15	0.91
	Servant leadership	3.95	1.68	5.23	0.91
Healthy organizational practices	Work-life balance	4.00	1.51	4.25	1.40
	Prevention of mobbing	3.08	1.85	3.85	1.80
	Skill development	3.62	1.56	4.03	1.50
	Career development	2.85	1.73	3.22	1.62
	Health programs	3.10	1.61	3.69	1.50
	Equity	2.71	1.69	3.48	1.60
	Organizational information	3.85	1.49	4.32	1.35
	Social responsibility	3.79	1.54	4.09	1.62
Job demands	Equality	3.58	1.77	4.27	1.71
	Role ambiguity	1.63	1.47	1.76	1.32
	Role conflict	1.84	1.51	1.71	1.24
	Routine	2.58	1.58	2.48	1.29
	Mobbing	1.41	1.53	1.19	1.40
Healthy employee	Emotional dissonance	2.21	1.65	1.93	1.53
	Collective efficacy	4.74	1.09	5.15	0.89
	Engagement	4.60	1.14	4.56	0.97
	Public service motivation	5.35	0.96	4.99	1.11
	Vertical trust	4.25	1.40	4.54	1.10
	Horizontal trust	4.67	1.11	4.85	0.89
Healthy organizational outcomes	Resilience	4.66	1.15	4.74	1.09
	In-role performance	5.56	0.72	5.41	0.75
	Extra-role performance	4.34	1.28	4.10	1.22
	Affective organizational commitment	5.18	1.13	4.98	1.04

The tables below present the results of the first objective of the study, which is to evaluate the reliability of the HEROCheck Public instrument for public sector workers and supervisors in Chile. Factor loadings, along with reliability indices for the measure are presented for workers and supervisors in Tables 3 and 4, respectively. Overall, results show that both groups demonstrate adequate values across their factors.

TABLE 3  
 Factor loading and reliability indices (Workers,  $N = 1,188$ )

Factors	Variables	Factor loadings			Reliability indices			
		Estimate	SE	CI (95%)	$\alpha$	$\omega$	CR	AVE
Job and social resources	Autonomy	0.43	0.04	[0.49, 0.64]	.77	.76	.77	.46
	Feedback	0.71	0.04	[1.03, 1.19]				
	Supportive climate	0.83	0.04	[1.17, 1.32]				
	Coordination	0.69	0.03	[0.78, 0.91]				
Leadership	Positive leadership	0.94	0.04	[1.48, 1.62]	.93	.93	.93	.87
	Servant leadership	0.93	0.04	[1.49, 1.64]				
Healthy organizational practices	Work-life balance	0.63	0.04	[0.87, 1.03]	.91	.91	.91	.53
	Prevention of mobbing	0.63	0.05	[1.07, 1.27]				
	Skill development	0.76	0.04	[1.10, 1.26]				
	Career development	0.77	0.04	[1.26, 1.43]				
	Health programs	0.80	0.04	[1.21, 1.37]				
	Equity	0.80	0.04	[1.27, 1.43]				
	Organizational information	0.71	0.04	[0.99, 1.14]				
	Social responsibility	0.72	0.04	[1.04, 1.19]				
Equality	0.68	0.05	[1.11, 1.29]					
Job demands	Role ambiguity	0.63	0.04	[0.84, 1.01]	.77	.78	.79	.43
	Role conflict	0.78	0.04	[1.09, 1.25]				
	Routine	0.50	0.05	[0.70, 0.88]				
	Mobbing	0.73	0.04	[1.03, 1.20]				
	Emotional dissonance	0.59	0.05	[0.88, 1.07]				
Healthy employee	Collective efficacy	0.57	0.03	[0.56, 0.67]	.82	.83	.89	.60
	Engagement	0.71	0.03	[0.75, 0.87]				
	Public service motivation	0.39	0.03	[0.32, 0.43]				
	Vertical trust	0.80	0.04	[1.05, 1.19]				
	Horizontal trust	0.64	0.03	[0.65, 0.77]				
	Resilience	0.73	0.03	[0.78, 0.90]				
Healthy organizational outcomes	In-role performance	0.47	0.02	[0.29, 0.38]	.69	.69	.57	.35
	Extra-role performance	0.32	0.04	[0.32, 0.48]				
	Affective organizational commitment	0.78	0.04	[0.81, 0.96]				

Note. SE = standard error; CR = composite reliability; AVE = average variance extracted.

TABLE 4  
 Factor loading and reliability indices (Supervisors,  $N = 155$ )

Factors	Variables	Factor loadings			Reliability indices			
		Estimate	SE	CI (95%)	$\alpha$	$\omega$	CR	AVE
Job and social resources	Autonomy	0.51	0.07	[0.29, 0.56]	.75	.76	.75	.43
	Feedback	0.62	0.08	[0.50, 0.83]				
	Supportive climate	0.74	0.08	[0.65, 0.97]				
	Coordination	0.74	0.07	[0.56, 0.83]				
Leadership	Positive leadership	0.85	0.06	[0.65, 0.90]	.79	.79	.79	.65
	Servant leadership	0.76	0.07	[0.56, 0.82]				
Healthy organizational practices	Work-life balance	0.71	0.10	[0.80, 1.19]	.91	.91	.91	.54
	Prevention of mobbing	0.71	0.13	[1.01, 1.52]				
	Skill development	0.70	0.11	[0.83, 1.25]				
	Career development	0.70	0.12	[0.90, 1.35]				
	Health programs	0.89	0.10	[1.14, 1.51]				
	Equity	0.76	0.11	[1.00, 1.44]				
	Organizational information	0.71	0.10	[0.77, 1.14]				
	Social responsibility	0.70	0.12	[0.90, 1.36]				
	Equality	0.75	0.12	[1.04, 1.51]				
Job demands	Role ambiguity	0.68	0.10	[0.70, 1.10]	.78	.78	.78	.43
	Role conflict	0.77	0.09	[0.77, 1.13]				
	Routine	0.47	0.11	[0.40, 0.82]				
	Mobbing	0.73	0.11	[0.81, 1.22]				
	Emotional dissonance	0.56	0.12	[0.61, 1.10]				
Healthy employee	Collective efficacy	0.79	0.06	[0.58, 0.82]	.88	.88	.88	.55
	Engagement	0.86	0.06	[0.70, 0.95]				
	Public service motivation	0.73	0.08	[0.65, 0.96]				
	Vertical trust	0.67	0.08	[0.58, 0.89]				
	Horizontal trust	0.67	0.07	[0.47, 0.72]				
	Resilience	0.73	0.08	[0.64, 0.94]				
Healthy organizational outcomes	In-role performance	0.65	0.06	[0.38, 0.60]	.70	.73	.72	.46
	Extra-role performance	0.60	0.10	[0.54, 0.91]				
	Affective organizational commitment	0.78	0.08	[0.65, 0.96]				

Note. SE = standard error; CR = composite reliability; AVE = average variance extracted.

Tables 3 and 4 display the results of the second objective of the study, which is to evaluate the validity of the HEROCheck Public instrument for public sector workers and supervisors in Chile. Results demonstrate that the HEROCheck 6-factor model, which integrates job demands, servant leadership, and public service motivation, showed a good fit overall. In addition, measurement invariance was confirmed up to the metric level, meaning that item loadings are equivalent for both males and females in both workers and supervisors (Putnick & Bornstein, 2016).

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## DISCUSSION

This study contributes to the integration of the Job Demands-Resources (JD-R) theory with the Healthy and Resilient Organization (HERO) model by incorporating job demands, enhancing the HERO model specifically for the public sector by including unique variables such as servant leadership and public service motivation. Reliability indices for workers and supervisors indicate good internal consistency across the measured factors, which is essential to ensure that the instrument consistently measures constructs related to psychosocial and organizational health factors in various settings within the Chilean public sector. Our results also indicate that the inclusion of job demands as an additional factor in the HERO model allows for a more comprehensive evaluation of work environments in the public sector. This is consistent with previous studies that have shown that job demands not only affect stress and burnout but can also influence engagement and job satisfaction when adequately managed with appropriate resources (Bakker et al., 2014).

Confirmatory factor analysis results indicate that the 6-factor model, which improves the original 5-factor HERO model by including job demands as well as specific variables such as servant leadership in the leadership factor and public service motivation in the healthy employee factor, provides an adequate fit for both workers and supervisors. This improved fit highlights the importance of incorporating variables specifically aligned with the public sector to ensure a more holistic understanding of the factors influencing employee well-being and organizational outcomes (Khusanova et al., 2021).

By emphasizing the importance of serving others, both inside and outside the organization and acting as role models, the inclusion of servant leadership enhances job performance by fostering greater public service motivation (PSM) among followers (Eva et al., 2019). The inclusion of this type of leadership in the HERO model not only strengthens the instrument's validity in the public sector but also provides a framework for interventions that can improve public employees' engagement and performance. Through stewardship, empowerment, accountability, and the promotion of a learning culture, servant leadership aligns employees with a shared vision, fosters autonomy and innovation, ensures a results-oriented approach, and creates a supportive and appreciative environment (Martinez de Castro Pinto Luz & Sousa, 2018). Public service motivation, a construct increasingly studied and debated, has been shown to be a critical factor influencing public employees' ethics and performance (Meyer-Sahling et al., 2019; Perry & Wise, 1990). Integrating PSM into the HERO model recognizes the importance of motivating employees not only through extrinsic rewards but also through an intrinsic sense of purpose and vocation, which is essential for managing the unique demands of the public sector (Christensen et al., 2017).

These findings highlight the utility of the HEROCheck Public as an effective tool for the rapid and reliable assessment of working conditions and psychosocial factors in the Chilean public sector. The configural invariance analysis shows that the HEROCheck Public instrument has structural consistency across genders for workers, indicating that the instrument assesses the same constructs of psychosocial risks regardless of the participant's gender, providing initial evidence of its applicability in different gender groups in this sector. This conclusion does not hold for the supervisor sample, suggesting limitations in its applicability for this group. The lack of metric equivalence raises significant questions about the uniform interpretation of the questionnaire items across genders. This metric nonequivalence suggests that, although the items theoretically assess the same constructs, the relative contribution of each item varies between men and women (Putnick & Bornstein, 2016), potentially indicating that certain aspects of psychosocial risks are perceived or experienced differently by men and women in the context of Chilean public administration.

Thus, this study emphasizes the need for gender-sensitive assessment tools, given that men and women perceive and respond differently to job demands and resources (Cifre et al., 2011; Purvanova & Muros, 2010).

This finding is consistent with research indicating that women tend to report higher levels of stress and burnout compared to men (Aguirre Mas et al., 2018; Organization for Economic Cooperation and Development, 2022) which may be related to gender role expectations and additional responsibilities outside of work (Ansoleaga et al., 2016). Adapting assessment tools to capture these differences is essential for promoting a more inclusive and equitable work environment.

Finally, the research highlights the importance of adopting a comprehensive approach to preventing psychosocial risks at work. This holistic approach involves not only identifying and addressing the negative factors that can cause stress and other problems but also studying the positive mechanisms that can enhance employee well-being. By analyzing both positive and negative aspects, a deeper and more balanced understanding of the interactions between work, the organization, and employees can be achieved (Gonçalves et al., 2022). This enables the development of more effective strategies to create a healthy and sustainable work environment, where risks are minimized, and well-being and productivity are promoted. While traditional assessments have focused on identifying and mitigating risks, our findings suggest that a combination of strategies that also evaluate positive factors such as servant leadership and public service motivation could represent a more effective approach toward a comprehensive diagnosis of psychosocial risk factors at work. This more holistic perspective addresses not only the negative aspects of the public work environment but also fosters a healthy and resilient workplace.

## CONCLUSIONS

The study aimed to evaluate the psychometric properties of the HEROCheck Public instrument, designed as a concise and rapidly applicable tool for assessing psychosocial factors and healthy organizations in a sample of workers and supervisors in the Chilean public sector. The findings confirmed the reliability and structural validity of the HEROCheck Public, composed of six factors. This indicates that the instrument is a robust tool for psychosocial risk prevention assessment, facilitating its management in this specific population. The brevity of the instrument is particularly useful in complex work environments where time is a valuable resource. Its ability to conduct rapid assessments minimizes workflow disruptions, enabling timely evaluations without sacrificing accuracy or depth of analysis. This feature is essential for agile and adaptive interventions that respond to the changing needs of the work environment and for the continuous monitoring of the psychosocial health of organizations.

## LIMITATIONS AND FUTURE DIRECTIONS

A limitation of this study is the use of a cross-sectional design, which, although useful for identifying patterns at a specific time, does not allow for establishing causal relationships between variables. Moreover, focusing the study on the Chilean context, while facilitating understanding of the particularities of the public sector in this country, may limit the generalizability of the findings to other cultures or organizational contexts. These limitations affect the interpretation and applicability of the results. The lack of causality implies that the findings should be considered with caution, and there could be unexamined variables affecting the findings. Therefore, it is recommended to conduct longitudinal studies for a deeper analysis of causal relationships. The limited generalizability also suggests the need to replicate this study in different contexts to verify the consistency of the results and their universal applicability. Despite these limitations, the findings provide a solid

foundation for future research that promotes workplace well-being in the public sector, highlighting the importance of adapting strategies to each specific context considering gender differences.

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APPENDIX  
Public Participating Institutions

Ministry	Institutions
Ministerio de Agricultura [Ministry of Agriculture]	1. Comisión Nacional de Riego [National Irrigation Commission] 2. Instituto de Desarrollo Agropecuario [Agricultural Development Institute] 3. Oficina de Políticas Agrarias [Office of Agricultural Policies]
Ministerio de Defensa [Ministry of Defense]	4. Caja de Previsión de la Defensa Nacional [National Defense Pension Fund]
Ministerio de Economía, Fomento y Turismo [Ministry of Economy, Development, and Tourism]	5. Instituto Nacional de Estadística [National Institute of Statistics] 6. Instituto Nacional de Propiedad Industrial [National Institute of Industrial Property] 7. Servicio Nacional de Pesca y Acuicultura [National Fisheries and Aquaculture Service] 8. Superintendencia de Insolvencia y Reemprendimiento [Superintendency of Insolvency and Entrepreneurship]
Ministerio de Educación [Ministry of Education]	9. Junta Nacional de Jardines Infantiles [National Board of Kindergartens] 10. Superintendencia de Educación [Superintendency of Education] 11. Superintendencia de Educación Superior [Superintendency of Higher Education]
Ministerio de Energía [Ministry of Energy]	12. Comisión Chilena de Energía Nuclear [Chilean Nuclear Energy Commission]
Ministerio de Hacienda [Ministry of Finance]	13. Dirección de Compras y Contratación Pública [Public Procurement and Contracting Directorate] 14. Servicio de Impuestos Internos [Internal Revenue Service] 15. Servicio Nacional de Aduanas [National Customs Service] 16. Superintendencia de Casinos de Juego [Superintendency of Gambling Casinos] 17. Tesorería General de la República [General Treasury of the Republic]
Ministerio del Interior y Seguridad Pública [Ministry of the Interior and Public Security]	18. Dirección de Previsión de Carabineros de Chile [Carabineros of Chile Pension Directorate]
Ministerio de Justicia y Derechos Humanos [Ministry of Justice and Human Rights]	19. Defensoría Penal Pública [Public Criminal Defender's Office] 20. Servicio de Registro Civil e Identificación [Civil Registry and Identification Service] 21. Servicio Médico Legal [Legal Medical Service]
Ministerio de Medio Ambiente [Ministry of the Environment]	22. Superintendencia del Medio Ambiente [Superintendency of the Environment]
Ministerio de la Mujer y la Equidad de Género [Ministry of Women and Gender Equity]	23. Servicio Nacional de la Mujer y la Equidad de Género [National Service for Women and Gender Equity]
Ministerio de Obras Públicas [Ministry of Public Works]	24. Dirección General de Obras Públicas [General Directorate of Public Works]
Ministerio de Relaciones Exteriores [Ministry of Foreign Affairs]	25. Agencia Chilena de Cooperación Internacional para el Desarrollo [Chilean International Cooperation Agency for Development] 26. Instituto Antártico Chileno [Chilean Antarctic Institute]
Ministerio de Salud [Ministry of Health]	27. Servicio de Salud Aconcagua [Aconcagua Health Service] 28. Servicio de Salud Bío – Bío [Bío – Bío Health Service] 29. Servicio de Salud Concepción [Concepción Health Service] 30. Servicio de Salud Maule [Maule Health Service]

(appendix continues)

Appendix (continued)

Ministry	Institutions
<i>Ministerio de Salud</i> [Ministry of Health]	31. Servicio de Salud Metropolitano Suroriental [Southeastern Metropolitan Health Service] 32. Servicio de Salud Osorno [Osorno Health Service] 33. Servicio de Salud Talcahuano [Talcahuano Health Service] 34. Servicio de Salud Valparaíso – San Antonio [Valparaíso – San Antonio Health Service] 35. Superintendencia de Salud [Superintendency of Health]
Ministerio del Trabajo y Previsión Social [Ministry of Labor and Social Security]	36. Dirección General de Crédito Prendario [General Directorate of Pledge Credit] 37. Instituto de Seguridad Laboral [Labor Safety Institute] 38. Superintendencia de Pensiones [Superintendency of Pensions] 39. Superintendencia de Seguridad Social [Superintendency of Social Security]
Ministerio de Vivienda y Urbanismo [Ministry of Housing and Urban Development]	40. Servicio de Vivienda y Urbanismo Región Arica y Parinacota [Housing and Urban Development Service, Arica and Parinacota Region] 41. Servicio de Vivienda y Urbanismo Región Atacama [Housing and Urban Development Service, Atacama Region] 42. Servicio de Vivienda y Urbanismo Región de la Araucanía [Housing and Urban Development Service, Araucanía Region] 43. Servicio de Vivienda y Urbanismo Región de Los Lagos [Housing and Urban Development Service, Los Lagos Region]