

Article

Organizational Climate Scale for Public Service: Development and Validation

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Abstract: This research presents four studies that developed and validated the Organizational Climate Perception Scale for Public Service (OCPS-PS). The first qualitative study consulted the literature and conducted a focus group to develop the initial version of the scale. The second study involved expert evaluation and pre-testing, aiming at the semantic and face validation of the items. This study resulted in 80 items forming the thirteen dimensions of organizational climate. The third study obtained the first quantitative sample for the exploratory validation phase of the scale. The final study, using a new sample, conducted confirmatory tests for the validation of the scale. A methodology for applying the scale was developed, allowing all interested parties to use the OCPS-PS for the assessment of the organizational climate in public service. The results of the four conducted studies indicate the adequacy of the OCPS-PS according to the proposed criteria of validity and reliability. Finally, the OCPS-OS was built to be applied in different public organizations and at different government levels.

Keywords: organizational climate; public service; scale; validation; psychometric procedures



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1. Introduction

In environmental psychology, psychological environments encompass the various meanings individuals associate with their physical surroundings (Hur and Abner 2024; James et al. 2008). Specifically within the organizational setting, the psychological climate refers to the meanings individuals attribute to their jobs, coworkers, leaders, compensation, performance expectations, promotion opportunities, and fairness in treatment (James and Jones 1974).

Building upon these concepts, the initial primary purpose of organizational climate was to identify and assess the work environment through the direct and indirect perceptions of individuals working in that environment (Litwin and Stringer 1968). Shortly thereafter, McClelland (1972) observed that organizational climate serves as a tool for managing employee motivation.

In the view of Patterson et al. (2005), organizational climate is an essential dimension in the workplace, providing a means of study for organizational behavior research by identifying individual and group behaviors. In this context, Mutonyi et al. (2020) define climate as the cognitive representations of individuals and the psychological interpretations of their organizational environment. These designations already indicate the multidimensional nature of the concept (Pérez-Vallejo and Fernández-Muñoz 2020), regardless of whether it is a public or private organization.

Public organizations intervene with private organizations in terms of ownership, financing, and control (Bozeman 1987). Therefore, several factors must be taken into consideration, such as hierarchical levels, objectives and responsibilities, economic forecast/unfeasibility, legal and formal restrictions, flexibility/inflexibility in decision-making, social characteristics and functions, among other differences (Boye et al. 2022; Jain and Dhir

2022; Johansen and Zhu 2014; Meier and O'Toole 2011; Rainey 2014; Torfing et al. 2020; Van Wart 2013).

In addition to these, Knies et al. (2022) emphasize the traditional distinction between human resource management in public and private contexts, highlighting the search for equal opportunities in the public sector and the orientation towards performance in private sectors. In this sense, it is observed that management is also different, reflecting autonomy, coexistence with internal and external stakeholders, accountability, and values, affecting the organizational climate of each organization (Boye et al. 2022; Steinfeld 2023).

Especially concerning public organizations, there is a pressure for changes, setting a new pace for transformations, requiring constant adaptations in legal structures and political preferences, modifying the organizational climate (OC) unexpectedly and without the involvement of the majority of public servants (Babapour Chafi et al. 2022; Wynen et al. 2020). In several countries, the traditional, hierarchical, legalistic public administrations have been partially replaced by results-oriented public organizations. Public organizations have adopted the two central new public management goals, efficiency and effectiveness (Lapuente and Walle 2020). Performance in the public sector is now universally recognized as outcomes and impacts (Andersen et al. 2016). Additionally, when compared to the private sector, public organizations exhibit significant differences in people management processes, including selection and entry methods, progression and performance rules, job stability, and the occupation of management positions, among others.

However, the literature lacks scales specifically constructed and validated for assessing the organizational climate in the public context. One of the first models to study organizational climate was proposed by Litwin and Stringer (1968), who concluded that organizational climate fluctuated and could be modified (Ferreira and Ramal 2013). This reasoning was refined in the 1970s, 1980s, and 1990s, leading to the emergence of new models to identify organizational climate, including Campbell et al. (1970); Sims and LaFollette (1975); Schneider (1975); Sbragia (1983); Kolb et al. (1986), and Rizzatti (1995). The oldest scale found was that of Siegel and Kaemmerer (1978). In addition to this, numerous scales have been constructed for developed countries and adapted for developing countries, but without extensive cross-cultural validation (Banwo et al. 2022; Do Amaral et al. 2005; Santos and Paranhos 2017) or psychometric procedures (Curvo and Heinzmann 2017).

There are several motivations that led us to build a new scale, we list four: (i) the mismatch of the main scales already developed in the private context for investigating the organizational climate in the public sector; (ii) the need to adapt some concepts, dimensions, and items from private-oriented scales to the public service; (iii) the creation of new items and dimensions such as public value and professional performance that aim to highlight the perception of public servants; (iv) the scarcity of organizational climate scales that had psychometric validation.

In light of the above, the proposition of a specific measure of the organizational climate for public service holds central significance. Thus, the aim is to develop and validate the Organizational Climate Perception Scale for Public Service (OCPS-PS).

The construction of an organizational climate scale for public service can offer both theoretical and practical contributions. On the theoretical side, it seeks to deepen academic knowledge in the field of people management in public organizations. From a practical perspective, it provides managers with the means to assess the work environment by identifying employees' perceptions. Moreover, it serves as an important management tool. In this regard, the scale will enable the investigation of inter- and intra-organizational issues in various public agencies (Tripathi and Tripathi 2022), fostering new approaches.

2. Method

To construct and validate the OCPS-PS, four distinct studies were conducted. The implementation period of this study was the year 2023. The first study involved a literature review and a focus group. The literature review was carried out by searching the Web of Science and Scopus databases, focusing on the time frame from 2012 to 2022 and including

documents with the defined terms “organizational climate scale” in the title. The final sample consisted of 60 articles, allowing for the identification of key definitions, dimensions, and items of existing scales, leading to the preliminary construction of the OCPS-PS dimensions. Subsequently, a focus group was conducted with the participation of ten public servants from diverse socioeconomic, demographic, and professional backgrounds.

The second study included expert validation and a pre-test phase. Following [DeVellis and Thorpe \(2021\)](#) recommendation, six experts were selected—three with experience in scale construction and three with subject-matter expertise. A specific instrument was created for this step, providing specific instructions for the experts. For each item, questions were posed to assess the degree of pertinence (1—Should be removed, 2—Should be retained after reformulation, 3—Should be retained as is), the degree of relevance (1—Slightly Relevant, 2—Relevant, 3—Very Relevant), and the dimension represented by the item. To evaluate the level of agreement among the experts, the Content Validity Coefficient (CVC) and Fleiss’ kappa ([Fleiss 1971](#)) were used. Content validity refers to the extent to which a scale adequately samples items that represent the construct of interest ([Hinkin 1995](#)). The CVC is suitable for Likert-type scales, while Fleiss’ kappa is appropriate for nominal scales.

For the pre-test, 10 individuals were selected based on convenience sampling, in line with the suggestion of [Boateng et al. \(2018\)](#) that pre-test samples should include between 5 and 15 participants. The individuals were chosen from a variety of backgrounds to ensure that the language used in the instrument was appropriate for the entire target population.

For the third study, a new instrument with the OCPS-PS was developed and applied to a sample of 394 public servants for the purpose of exploratory validation of the scale. The polychoric correlation matrix was used, employing the Robust Diagonally Weighted Least Squares (RDWLS) factor extraction method and Robust Promin rotation ([Lorenzo-Seva and Ferrando 2019](#)).

Following [Timmerman and Lorenzo-Seva’s \(2011\)](#) recommendation, the parallel analysis was optimally implemented to estimate the number of factors. Additionally, the H index was evaluated ([Ferrando and Lorenzo-Seva 2018](#)), indicating factorial replicability. Items with values above 0.80 corresponded to the observed factors, suggesting that the factor structure could be replicated in other studies.

Internal consistency was assessed through calculations of Cronbach’s Alpha ([Cronbach 1951](#)) and McDonald’s Omega (ω) ([McDonald 1999](#)). Values equal to or greater than 0.7 were considered adequate for both measures ([Hair et al. 2019](#)).

In the fourth study, the OCPS-PS was administered to 374 public employees from a higher education institution for the purpose of confirmatory validation of the scale. Convergent validity, unidimensionality, and discriminant validity of the constructs were assessed. The models were estimated using maximum likelihood via a direct procedure.

Convergent validity was examined by observing the magnitude and statistical significance of the standardized coefficients, utilizing absolute fit indices such as chi-square statistics (χ^2), residual root mean square (RMR), root mean square error of approximation (RMSEA), and the Comparative Fit Index (CFI). Criteria considered for adequacy were values greater than 0.950 for CFI, RMSEA, and RMR values lower than 0.060 and 0.080, respectively, and a chi-square/degrees of freedom relationship with values below 3.0 ([Byrne 2010](#); [Hair et al. 2019](#); [Hooper et al. 2008](#); [Kline 2023](#)).

The research received approval from the Research Ethics Committee, and the participants provided their informed consent by signing the Free and Informed Consent Term (ICF). The instrument used was completely anonymously.

3. Analysis of Results

3.1. Study 1: Literature Review and Focus Group

Potential dimensions for the OCPS-PS were identified based on a literature review. The literature review was carried out for the period of 2012–2022 using the terms “climate organizational scale” in the Web of Science and Scopus databases. After removing dupli-

cates, a database with 60 articles was obtained. From reading their contents, 10 articles were identified whose scales were used in the most diverse sectors (Benzer and Horner 2015; Hutchinson et al. 2018; Nikolova et al. 2014); industrial (Hannevik et al. 2014; Jafari et al. 2017; Patterson et al. 2005); services (Finsel et al. 2021); educational (Buttner et al. 2012); cooperative (Zappala et al. 2018); and electronic devices (Mor Barak et al. 1998) sectors and which could serve as inspiration for the construction of the OCPS-PS items and dimensions.

The focus group included ten public servants with diverse socioeconomic, demographic, and professional profiles. The research protocol outlined the involvement of four researchers as facilitators for the method's application: a moderator, an observer, and two recorders. The dimensions of the OCPS-PS were presented to the participants, who were encouraged to raise and discuss issues related to the topic. The interview was recorded and transcribed. Appendix A provides a summary of the terms that emerged during the focus group.

Thus, by the end of this initial study, it was possible to construct the first version of the OCPS-PS. For the construction of the scale, we started from the concept of organizational climate, in which the OC is an essential dimension in the work environment, providing a means for investigating organizational behavior through the identification of individual and group behaviors (Patterson et al. 2005). Organizational climate is thus defined as the cognitive appraisal of the practices, policies, and procedures that are recognized and rewarded in the workplace (D'Amato and Zijlstra 2008; James et al. 1990; Jones and James 1979). Therefore, we define the organizational climate in public service as the cognitive evaluation of the practices, policies, and procedures that are recognized and rewarded in public organizations. The Organizational Climate Perception Scale for Public Service (OCPS-PS) thus assesses the perception of organizational climate in public service.

Following the extensive literature arguing that organizational climate cannot be measured from a single dimension (D'Amato 2023), the OCPS-PS was constructed from a set of 13 dimensions. Table 1 below presents the definitions of the 13 dimensions of the scale, indicates which items comprise each one, and provides the sources of inspiration for the items. Thus, The OCPS-PS assesses the perception of organizational climate in the public service from a second-order construct formed by these dimensions. The list of the 80 items forming the dimensions is found in Appendix B.

Table 1. Dimensions, definitions, and items of OCPS-PS.

Dimension	Definition	Items ¹	Inspiration
Autonomy	Evaluates the freedom of the employee to make decisions regarding their work.	1	Patterson et al. (2005)
		2	Patterson et al. (2005)
		3	Focus group
		4	Focus group
Interaction and Cooperation	Assesses the contribution of interactions and cooperation among employees to the organizational climate.	5	Patterson et al. (2005)
		6	Benzer and Horner (2015)
		7	Benzer and Horner (2015)
		8	Jafari et al. (2017)
		9	Jafari et al. (2017)
		10	Focus group
		11	Hutchinson et al. (2018)
Participation	Assesses the employee's perception of participation in decision making within the organizational environment.	12	Patterson et al. (2005)
		13	Patterson et al. (2005)
		14	Benzer and Horner (2015)
		15	Focus group
		16	Focus group
		17	Focus group

Table 1. Cont.

Dimension	Definition	Items ¹	Inspiration
Leadership Support	Assesses the employee's perception of leadership support. Support is understood as providing assistance, encouraging, promoting, recognizing, and stimulating actions and activities that contribute to the organizational climate.	18	Patterson et al. (2005)
		19	Focus group
		20	Hutchinson et al. (2018)
		21	Zappala et al. (2018)
		22	Zappala et al. (2018)
		23	Focus group
		24	Benzer and Horner (2015)
25	Benzer and Horner (2015)		
26	Focus group		
Training	Assesses the extent to which the organization promotes training, development, and qualifications that provide employees with opportunities to develop their skills and expertise.	27	Focus group
		28	Focus group
		29	Patterson et al. (2005)
		30	Nikolova et al. (2014)
		31	Patterson et al. (2005)
		32	Focus group
Formalization	Assesses the contribution of rules, regulations, rites, and formal procedures to the organizational climate.	33	Patterson et al. (2005); Benzer and Horner (2015)
		34	Benzer and Horner (2015)
		35	Focus group
		36	Patterson et al. (2005)
		37	Patterson et al. (2005)
Resistance to Change	Indicates a lack of openness to change and how much established ways of doing work are valued by the organization. Thus, the greater the tradition, the worse the climate.	38	Patterson et al. (2005)
		39	Patterson et al. (2005); Focus group
		40	Patterson et al. (2005)
		41	Patterson et al. (2005); Focus group
Public Value	Assesses how much employees perceive their work as having positive impacts on society. Measures the public value of the employee's work.	42	Focus group
		43	Focus group
		44	Patterson et al. (2005)
		45	Focus group
		46	Patterson et al. (2005)
		47	Patterson et al. (2005)
48	Focus group		
Organizational Clarity	Evaluates the degree to which objectives, functions, plans, and goals are clearly defined and communicated to the employee.	49	Patterson et al. (2005)
		50	Patterson et al. (2005)
		51	Hannevik et al. (2014)
		52	Focus group
		53	Focus group
Inefficiency	Assesses how lack of productivity, poor task scheduling, deficiencies in the communication process result in inefficiency in the employee's work.	54	Patterson et al. (2005)
		55	Patterson et al. (2005)
		56	Patterson et al. (2005)
		57	Patterson et al. (2005)
		58	Focus group
		59	Focus group
		60	Focus group
61	Focus group		
Professional Performance	Evaluates the degree to which the employee understands the work, performs it, and is recognized for what they do.	62	Patterson et al. (2005)
		63	Zappala et al. (2018)
		64	Patterson et al. (2005)
		65	Focus group
Performance	Identifies how employees perceive job performance, evaluations, and feedback.	66	Patterson et al. (2005)
		67	Benzer and Horner (2015)
		68	Buttner et al. (2012)
		69	Focus group
		70	Patterson et al. (2005)

Table 1. Cont.

Dimension	Definition	Items ¹	Inspiration
Diversity	Assesses how organizational behaviors and attitudes respect diversity.	71	Focus group
		72	Focus group
		73	Finsel et al. (2021)
		74	Mor Barak et al. (1998)
		75	Focus group
		76	Mor Barak et al. (1998)
		77	Focus group
		78	Focus group
		79	Focus group
		80	Focus group

Note: ¹ The items are described in Appendix B.

3.2. Study 2: Expert Analysis and Pre-Test

In order to assess content validity, intelligibility, and relevance of the dimensions and items of the scale, a convenience sample of six experts was selected based on the desired type of experience (scale construction and scale theme) (DeVellis and Thorpe 2021). All experts hold doctoral degrees, are researchers in human resource management with experience in survey research, and three have extensive experience in scale construction. Data collection for observations took place through a Google Forms instrument.

For each item in the instrument, questions were presented regarding the item's relevance (1—Should be removed, 2—Should be kept after reformulation; 3—Should be kept as it is), the degree of relevance (1—Slightly relevant, 2—Relevant; 3—Very relevant), the wording of the item in terms of language (1—Adequate, 2—Inadequate), and the represented dimension. The Content Validity Coefficient (CVC) was calculated for each dimension based on the experts' responses. Table 2 summarizes the results.

Table 2. Content Validity Coefficient of the dimensions in the OCPS-PS.

Dimension	CVC								
	Pertinence			Relevance			Language		
	Min.	Mean	Max.	Min.	Mean	Max.	Min.	Mean	Max.
Autonomy	0.889	1.000	1.000	0.944	0.944	1.000	0.833	1.000	1.000
Interaction and Cooperation	0.667	0.889	1.000	0.611	0.889	1.000	0.833	0.917	1.000
Participation	0.778	0.889	1.000	0.778	0.833	1.000	0.833	0.917	1.000
Leadership Support	0.833	1.000	1.000	0.833	1.000	1.000	0.917	1.000	1.000
Training	0.889	0.972	1.000	0.889	0.944	1.000	0.917	0.958	1.000
Formalization	0.944	0.944	1.000	0.667	0.833	1.000	0.833	0.917	1.000
Resistance to Change	0.833	0.944	1.000	0.778	0.944	1.000	0.917	1.000	1.000
Public Value	0.778	0.944	1.000	0.833	0.944	1.000	0.833	1.000	1.000
Organizational Clarity	0.778	0.944	1.000	0.833	0.944	1.000	0.917	1.000	1.000
Inefficiency	0.667	0.889	1.000	0.667	0.833	1.000	0.917	1.000	1.000
Professional Performance	0.889	0.889	1.000	0.833	0.889	1.000	0.917	1.000	1.000
Performance	0.889	1.000	1.000	0.889	0.944	1.000	0.917	1.000	1.000
Diversity	0.889	0.889	1.000	0.944	0.944	1.000	1.000	1.000	1.000
OCPS-PS	0.667	0.994	1.000	0.611	0.944	1.00	0.833	1.000	1.000

It is observed that all the average content validity coefficients were above 0.800. However, for the Inefficiency Dimension, it was necessary to remove Item 55 from the scale as it presented a CVC below the recommended threshold of 0.700, as established by Hair et al. (2019). Thus, all 79 items were revised based on the experts' comments, and a new printed instrument was created for the pre-test.

Ten public servants participated in the pre-tests, selected for convenience, with different socioeconomic and demographic profiles. After analyzing the observations from the

pre-test and making adjustments, the final instrument remained with 13 dimensions and 79 items.

3.3. Study 3: Exploratory Validation

For this study, a sample of 394 instruments was collected through an online application among public servants. Exploratory factor analysis was used with a polychoric correlation matrix and estimation by Robust Diagonally Weighted Least Squares (RDWLS).

Following the approach of Hair et al. (2019), items with factor loadings below 0.5 were removed from each dimension. The removed items for each dimension were as follows: autonomy, item 4 (−0.446); participation, item 16 (−0.081), item 15 (−0.266), and item 17 (−0.469); formalization, item 35 (0.301) and item 33 (0.480); professional performance, item 65 (−0.318).

After removal, the results for each dimension of OCPS-PS are presented in Table 3.

Table 3. Dimensions, factor loadings, explained variance, parallel analysis, H index, Cronbach’s alpha, and McDonald’s omega for the OCPS-PS.

Dimension	Item	Factor Loading Final	Explained Variance (%)	Parallel Analysis (Mean of Random)	H Index	Alpha and Omega
Autonomy	Item 1	0.958	88.281	97.759 (68.422)	0.953	$\alpha = 0.935$ $\omega = 0.935$
	Item 2	0.937				
	Item 3	0.831				
Interaction and Cooperation	Item 5	0.865	59.905	64.716 (29.054)	0.923	$\alpha = 0.886$ $\omega = 0.887$
	Item 6	0.880				
	Item 7	0.836				
	Item 8	0.702				
	Item 9	0.635				
	Item 10	0.615				
Participation	Item 12	0.916	89.274	96.417 (67.729)	0.953	$\alpha = 0.939$ $\omega = 0.940$
	Item 13	0.960				
	Item 14	0.873				
Leadership Support	Item 18	0.867	79.769	84.995 (84.995)	0.971	$\alpha = 0.968$ $\omega = 0.968$
	Item 19	0.859				
	Item 20	0.882				
	Item 21	0.924				
	Item 22	0.920				
	Item 23	0.881				
	Item 24	0.879				
	Item 25	0.866				
Item 26	0.855					
Training	Item 27	0.531	63.082	67.965 (34.330)	0.906	$\alpha = 0.880$ $\omega = 0.883$
	Item 28	0.771				
	Item 29	0.819				
	Item 30	0.816				
	Item 31	0.827				
Formalization	Item 32	0.782	72.171	86.722 (68.999)	0.833	$\alpha = 0.806$ $\omega = 0.810$
	Item 34	0.665				
	Item 36	0.854				
	Item 37	0.775				
Resistance to Change	Item 38	0.774	61.094	67.950 (51.230)	0.948	$\alpha = 0.780$ $\omega = 0.800$
	Item 39	0.500				
	Item 40	0.970				
	Item 41	0.534				

Table 3. Cont.

Dimension	Item	Factor Loading Final	Explained Variance (%)	Parallel Analysis (Mean of Random)	H Index	Alpha and Omega
Public Value	Item 42	0.772	67.360	74.198 (29.169)	0.929	$\alpha = 0.918$ $\omega = 0.919$
	Item 43	0.838				
	Item 44	0.836				
	Item 45	0.795				
	Item 46	0.860				
	Item 47	0.796				
	Item 48	0.614				
Organizational Clarity	Item 49	0.786	79.129	81.848	0.951	$\alpha = 0.918$ $\omega = 0.919$
	Item 50	0.942				
	Item 51	0.892				
	Item 52	0.851				
	Item 53	0.881				
Inefficiency	Item 54	0.596	59.240	65.697	0.905	$\alpha = 0.848$ $\omega = 0.854$
	Item 56	0.716				
	Item 57	0.537				
	Item 58	0.886				
	Item 59	0.826				
	Item 60	0.763				
	Item 61	0.749				
Professional Performance	Item 62	0.935	76.868	87.039 (67.166)	0.905	$\alpha = 0.848$ $\omega = 0.854$
	Item 63	0.765				
	Item 64	0.729				
Performance	Item 66	0.712	65.860	76.351 (40.694)	0.877	$\alpha = 0.870$ $\omega = 0.870$
	Item 67	0.737				
	Item 68	0.756				
	Item 69	0.751				
	Item 70	0.833				
Diversity	Item 71	0.832	66.403	73.971 (20.238)	0.953	$\alpha = 0.943$ $\omega = 0.943$
	Item 72	0.814				
	Item 73	0.856				
	Item 74	0.641				
	Item 75	0.699				
	Item 76	0.731				
	Item 77	0.865				
	Item 78	0.853				
	Item 79	0.875				
	Item 80	0.769				

Table 3 indicates that the factor loadings were high, with all values above 0.5, indicating adequate representability of each item in the dimension. All values from the parallel analysis were higher than the random mean, and all explained variances were high, confirming unidimensionality. Additionally, the H indices were above 0.800, characterizing the possibility of replicating the factors in new studies. The values of Cronbach's Alpha and McDonald's Omega were also satisfactory (greater than 0.700), denoting internal consistency for the dimensions.

Thus, the third study suggested that the OCPS-PS can be maintained with the 13 dimensions and that 72 items are suitable for its measurement.

3.4. Study 4: Confirmatory Validation

In this study, a second quantitative sample was used, making a total of 374 respondents. Table 4 lists the results of the initial and final fit indices for each of the dimensions. For constructs in which the initial models were not adequate, the model improvement strategy was adopted, mainly with the removal of variables with low factor loadings.

Table 4. Adjustment indices for the OPCS-PS constructs.

Dimension	χ^2 /Degrees of Freedom		CFI—Comparative Fit Index		RMSR—Root Mean Square Residual		RMSEA—R. M. S Error of Approximation		AVE
	Initial	Final ¹	Initial	Final ²	Initial	Final ³	Initial	Final ⁴	
Autonomy	0.372	0.372	1.000	1.000	0.004	0.004	0.000	0.000	0.727
Interaction and Cooperation	8.425	2.167	0.904	0.997	0.062	0.011	0.141	0.056	0.632
Participation	1.953	1.953	0.999	0.999	0.009	0.009	0.051	0.051	0.775
Management Support	4.489	2.385	0.970	0.992	0.028	0.017	0.097	0.060	0.702
Training	12.148	0.078	0.908	1.000	0.060	0.006	0.173	0.000	0.685
Formalization	0.352	0.352	1.000	1.000	0.006	0.006	0.000	0.000	0.573
Resistance to Change	2.149	0.217	0.995	1.000	0.016	0.018	0.055	0.000	0.606
Public Value	15.401	0.002	0.842	1.000	0.061	0.001	0.196	0.000	0.635
Organizational Clarity	19.029	2.302	0.933	0.998	0.048	0.010	0.220	0.059	0.646
Inefficiency	6.544	0.186	0.936	1.000	0.049	0.004	0.122	0.000	0.676
Professional Acting	0.190	0.190	1.000	1.000	0.013	0.013	0.000	0.000	0.609
Performance	4.450	0.530	0.978	1.000	0.027	0.008	0.096	0.000	0.620
Diversity	9.772	2.104	0.876	0.996	0.079	0.014	0.153	0.054	0.667

Note: ¹ χ^2 /degrees of freedom < 5.000; ² CFI—Comparative Fit Index > 0.950; ³ RMSR—Root Mean Square Residual < 0.080; ⁴ RMSEA—R. M. S Error of Approximation < 0.060; ⁵ Average Variance Extracted (AVE) > 0.500.

As demonstrated in Table 4, the dimensions of autonomy, participation, formalization, and professional acting retained the same items from the exploratory stage. However, aiming to optimize the dimensions, some items were removed as they had factor loadings below 0.700, and some correlations were necessary.

For the dimension of interaction and cooperation, it was necessary to remove items 10 (0.558), 11 (0.608), 8 (0.618), and 9 (0.625). As for management support, correlations between the errors of items 25 and 26 (0.188), 20 and 24 (0.153), 18 and 21 (0.175) were found, and item 19 (0.731) was removed. Regarding training, items 27 (0.443), 28 (0.657), and 29 (0.622) were removed. For resistance to change, items 38, 39, and 40 were retained, and item 41 (0.395) was excluded. For public value, items 48 (0.538), 42 (0.678), 45 (0.631), and 44 (0.676) were removed. Regarding organizational clarity, the following correlations between the errors of items 51 and 52 (0.512), 49 and 52 (0.377), 49 and 51 (0.196) were found. For inefficiency, items 57 (0.519), 54 (0.548), 56 (0.660), and 61 (0.647) were removed. In terms of performance, items 68 (0.641) and 69 (0.648) were excluded. For diversity, items 74 (0.570), 75 (0.633), 76 (0.614), and 80 (0.643) were removed.

The next step was verifying the discriminant validity between each pair of constructs. For this purpose, the criterion proposed by [Fornell and Larcker \(1981\)](#) was applied, where the calculation of the square root of the average variance extracted (AVE) should be greater than the correlation between the constructs. Table 5 presents the results.

It appears that the criterion was observed for all constructs, indicating discriminant validity. Additionally, all dimensions had standardized residuals below 2.58 ([Hair et al. 2019](#)), confirming unidimensionality.

Table 5. Discriminant Validity Tests according to Fornell and Larcker.

Dimension	1*	2*	3*	4*	5*	6*	7*	8*	9*	10*	11*	12*	13*
1*	<i>0.852</i>												
2*	0.467	<i>0.795</i>											
3*	0.472	0.602	<i>0.880</i>										
4*	0.644	0.629	0.606	<i>0.838</i>									
5*	0.342	0.593	0.517	0.517	<i>0.828</i>								
6*	0.465	0.510	0.481	0.481	0.646	<i>0.757</i>							
7*	0.130	0.361	0.283	0.292	0.365	0.275	<i>0.778</i>						
8*	0.309	0.525	0.450	0.454	0.594	0.581	0.453	<i>0.797</i>					
9*	0.376	0.626	0.735	0.616	0.766	0.625	0.382	0.654	<i>0.804</i>				
10*	0.366	0.535	0.680	0.546	0.556	0.433	0.516	0.514	0.692	<i>0.822</i>			
11*	0.141	0.536	0.375	0.382	0.491	0.469	0.465	0.570	0.606	0.431	<i>0.780</i>		
12*	0.380	0.657	0.591	0.640	0.664	0.562	0.457	0.688	0.729	0.556	0.714	<i>0.787</i>	
13*	0.505	0.620	0.636	0.580	0.620	0.561	0.386	0.568	0.686	0.677	0.572	0.637	<i>0.817</i>

Legend: 1* Autonomy; 2* Interaction and Cooperation; 3* Participation; 4* Management Support; 5* Training; 6* Formalization; 7* Resistance to Change; 8* Public Value; 9* Organizational Clarity; 10* Inefficiency; 11* Professional Acting; 12* Performance; 13* Diversity. Note: Elements of the main diagonal (italics)—Square root of AVE; Other values—Correlation between constructs.

After the validation of each construct, the estimation of the OCPS-PS was conducted. Table 6 presents the initial and final results. Two models were considered: Model 1 is the OCPS-PS scale with all dimensions correlated with each other, and Model 2 is a second-order model.

Table 6. Adjustment indices for the OCPS-PS.

Index	Bound	Model 1		Model 2	
		Initial	Final	Initial	Final
χ^2 (value)	-	1835.700	1658.503	2191.467	1702.590
χ^2 (probability)	>0.050	0.000	0.000	0.000	0.000
χ^2 /degrees of freedom	<5.000	1.845	1.687	2.067	1.658
CFI—Comparative Fit Index	>0.950	0.938	0.950	0.916	0.950
RMSR—Root Mean Square Residual	<0.080	0.060	0.056	0.075	0.050
RMSEA—R. M. S Error of Approximation	<0.060	0.048	0.043	0.053	0.042
AIC		2197.700	2044.503	2423.467	2000.758
BIC		2907.990	2801.884	2878.681	2585.473

As the initial models were found to be poorly fitting, a model adjustment strategy was adopted. For Model 1, correlations between the errors of the same constructs were added for 66 and 67, 58 and 59, 5 and 6, and 49 and 50. Subsequently, correlations were added between errors of different constructs that had theoretical sense: 12 and 77, 40 and 63, 46 and 63, 14 and 53, 12 and 36, 2 and 18, 39 and 58, 70 and 24. In Model 2, several correlations were made, as shown in Appendix C. After the adjustments, both models were deemed well-fitting. However, due to having lower AIC and BIC, Model 2, represented in Figure 1, was more parsimonious.

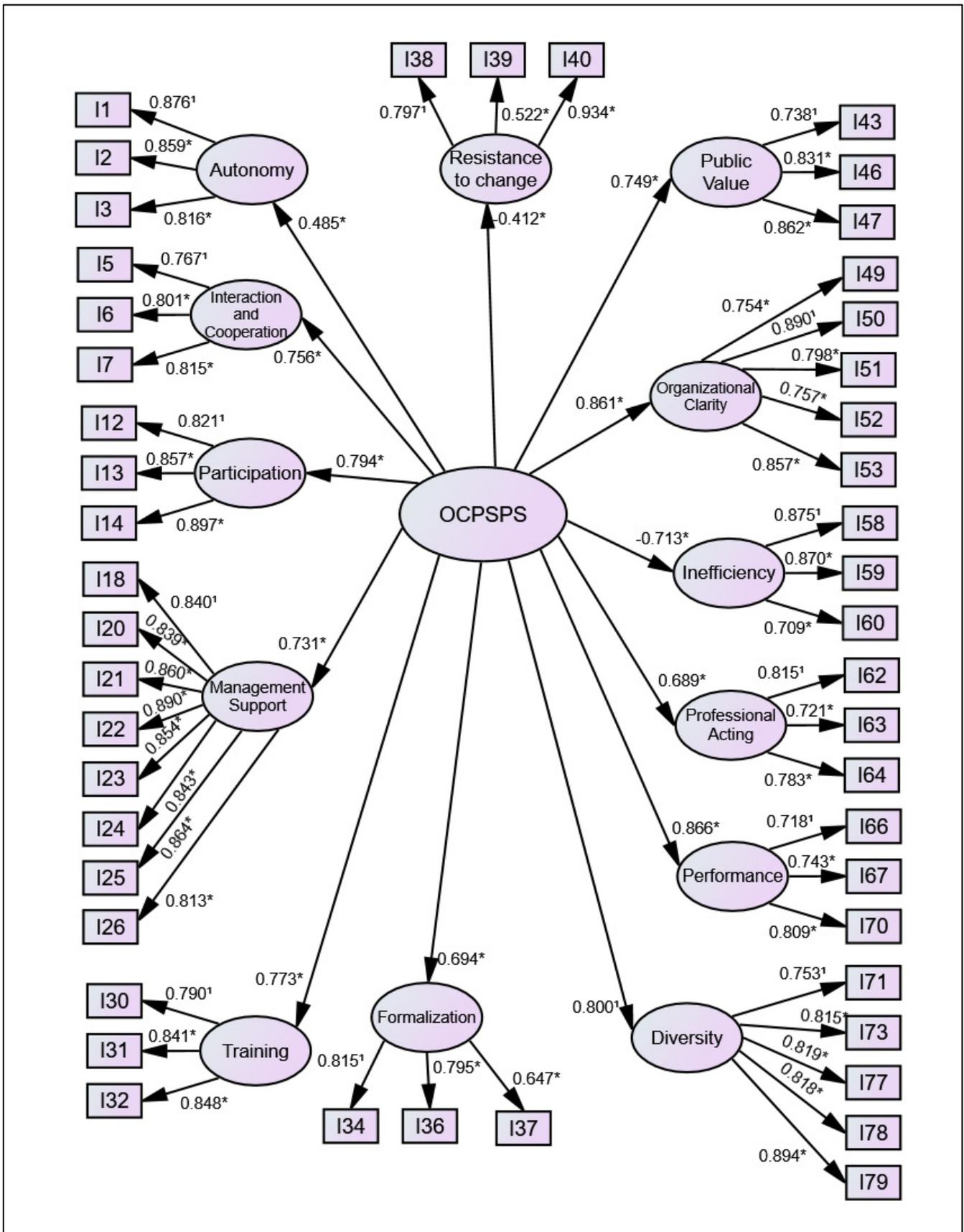


Figure 1. Final model of the OCPS-PS. Note: * $p < 0.01$; ¹ z-value not calculated, where the parameter was set to 1, due to model requirements. For simplicity, the correlations between the errors were not represented in the figure.

All thirteen dimensions significantly contributed to the formation of organizational climate perception. The dimensions with the highest loadings were performance and diversity, while autonomy and tradition were the least important for the formation of the OCPS-PS. The final model comprised 48 items, all with factor loadings above 0.5, indicating a substantial representativeness of the items in forming the measurement model.

Finally, a methodology for applying the scale was developed. Table 7 presents the calculations for forming the dimensions and for evaluating the perception of the organizational climate in public organizations. The weights of each item were defined based on the weighting of the factor loadings obtained in the final model.

Table 7. Calculations for measuring dimensions and the OCPS-PS.

Dimension	Formula
Autonomy	$0.343 \cdot I1 + 0.337 \cdot I2 + 0.320 \cdot I3$
Interaction and Cooperation	$0.322 \cdot I5 + 0.336 \cdot I6 + 0.342 \cdot I7$
Participation	$0.319 \cdot I12 + 0.333 \cdot I13 + 0.348 \cdot I14$
Management Support	$0.123 \cdot I18 + 0.123 \cdot I20 + 0.126 \cdot I21 + 0.131 \cdot I22 + 0.126 \cdot I23 + 0.124 \cdot I24 + 0.127 \cdot I25 + 0.120 \cdot I26$
Training	$0.319 \cdot I30 + 0.339 \cdot I31 + 0.342 \cdot I32$
Formalization	$0.361 \cdot I34 + 0.352 \cdot I36 + 0.287 \cdot I37$
Resistance to Change	$0.355 \cdot I38 + 0.231 \cdot I39 + 0.414 \cdot I40$
Public Value	$0.304 \cdot I43 + 0.342 \cdot I46 + 0.354 \cdot I47$
Organizational Clarity	$0.186 \cdot I49 + 0.219 \cdot I50 + 0.197 \cdot I51 + 0.187 \cdot I52 + 0.211 \cdot I53$
Inefficiency	$0.356 \cdot I58 + 0.355 \cdot I59 + 0.289 \cdot I60$
Professional Acting	$0.351 \cdot I62 + 0.311 \cdot I63 + 0.338 \cdot I64$
Performance	$0.316 \cdot I66 + 0.327 \cdot I67 + 0.356 \cdot I70$
Diversity	$0.183 \cdot I71 + 0.199 \cdot I73 + 0.200 \cdot I77 + 0.200 \cdot I78 + 0.218 \cdot I79$
OCPS-OS	$0.085 \cdot \text{Participation} + 0.044 \cdot \text{Resistance} + 0.080 \cdot \text{Public Value} + 0.083 \cdot \text{Training} + 0.079 \cdot \text{Management Support} + 0.075 \cdot \text{Formalization} + 0.093 \cdot \text{Performance} + 0.092 \cdot \text{Organizational Clarity} + 0.074 \cdot \text{Professional Acting} + 0.052 \cdot \text{Autonomy} + 0.076 \cdot \text{Inefficiency} + 0.086 \cdot \text{Diversity} + 0.081 \cdot \text{Interaction}$

Note: For Autonomy, Interaction and Cooperation, Participation, Management Support, Training, Formalization, Public Value, Organizational Clarity, Professional Acting, Performance and Diversity, assign the following values: 1 for Strongly Disagree, 2 for Disagree, 3 for Neutral, 4 for Agree, and 5 for Strongly Agree. For Resistance to Change and Inefficiency, assign the following values: 1 for Strongly Agree, 2 for Agree, 3 for Neutral, 4 for Disagree, and 5 for Strongly Disagree.

From the identification of each respondent’s perception, it was possible to obtain the perception for each dimension and for the OCPS-PS by calculating the simple average of the sample. These averages can be interpreted according to Table 8.

Table 8. Classification of the sample’s OCPS-PS.

Perception Level	Values	Evaluation
Very bad	1.00 to 1.99	Respondents selected for most items never or rarely, indicating a very negative perception of the organizational climate.
Bad	2.00 to 2.99	Respondents selected for most items rarely, sometimes, indicating a negative perception of the organizational climate.
Good	3.00 to 3.99	Respondents answered most items sometimes or often, indicating a positive perception of the organizational climate.
Very good	>3.99	Respondents answered most items often or always, indicating a very positive perception of the organizational climate.

Source: Prepared by the authors.

This application methodology can be used to identify the perception of the organizational climate in public organizations as a whole or in specific sectors of the institution. It is also possible to use specific dimensions since each construct has been individually validated. For example, autonomy can be evaluated using the items from that construct. Furthermore,

the OCPS-PS was developed to be self-administered. For applications involving interviews, the items will need to be adjusted.

This OCPS-OS was built to be applied in different public organizations and at different government levels. In this way, the scale can be applied to public hospitals and health centers, public universities, public security, and social security, among other public organizations. It can also be useful in studies focused on evaluating the OC in a specific area and at different levels of government. For example, OC studies in the educational sector may involve the Ministry of Education, education departments, public universities, and public basic and secondary schools.

4. Final Considerations

Despite the importance of identifying the organizational climate for personnel management, no consolidated scales specifically tailored to the context of public organizations have been identified. Public organizations exhibit significant differences in personnel management compared to private organizations, especially regarding career entry and progression, as well as job management. Additionally, public organizations operate within a legal and normative framework that directly influences how they manage their workforce. Thus, the innovation of this study lies in the pursuit of constructing and validating an organizational climate scale suitable for public service.

The results of the four conducted studies indicated the adequacy of the OCPS-PS according to the proposed criteria of validity and reliability. The OCPS-OS distinguishes itself from existing scales both by creating specific items in dimensions already proposed in the literature and by creating new fundamental dimensions for public organizations such as public value and professional performance.

The proposed application methodology is easy to implement and has the potential to be used in different contexts. Among the possible applications, the following can be highlighted: (1) a study using one or more of the proposed dimensions, as all dimensions were considered suitable. For example, researchers interested in studying diversity can use the five items from the dimension; (2) building models with the OCPS-PS as a precursor to other factors, such as well-being at work; (3) using difference tests and cluster analyses to identify groups with different perceptions of the organizational climate in the same public organization; (4) effects of changes in legislation and internal regulations on organizational climate; (5) longitudinal studies to identify changes in work perception over a professional career, among others.

Although this study is a significant step in the search for a measurement model of organizational climate in public services, one limitation is the lack of validation in different countries. Another limitation of the study is that in survey research, there is a possibility of response bias due to socially desirable answering. In this regard, further steps are required, including validation and implementation in other cultures, as well as investigating the possibility of adding new dimensions or items.

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Data Availability Statement: The data presented in this study are available on request from the corresponding author.

Conflicts of Interest: The authors declare no conflicts of interest.

Appendix A. Focus Group Perceptions

Dimension	Focus Group Perceptions
Autonomy	Responsibility; Commitment; Transparency; Communication/Dialogue; Respect; Flexibility; Team; Freedom of opinion; Trust; Change; Empowerment; Support; Ability to participate in final decisions; Freedom to propose improvements and changes; Encouragement from leadership for decision-making; Involvement in the construction process; Guidance; Clear rules; Security; Understanding; Clarity of legal support; Freedom to make mistakes; Participatory decision-making process; Initiative for decision-making; Delegation; Support; Management; Acceptance
Interaction and Cooperation	Monitoring established goals; Mutual knowledge (increases tolerance); Participation in joint activities; Willingness to collaborate with colleagues' work; Improve communication; Committees/Working groups; Team interaction; Results; Reciprocity in actions and activities; Collective work; Cordiality; Recognition; Problem-solving; Moments of socialization; Collaborative environments; Dialogue and shared decisions; Strategic development; Interpersonal relationships; Welcoming/Orientation; Positive interactions; Responsibility; Construction; Listening; Autonomy; Reduce noise.
Participation	Communication; Clarity; Positioning; Competence; Responsibility; Expression; Identity; Discuss; If people are heard-listening; Committees/Representation; Openness to suggestions; Openness/freedom of expression; Manager-centered; Making suggestions, observations; Pride in being part of it; Calls for discussions; Greater effort to achieve results; Commitment and responsibility for decisions; Collegial decisions; Organizational and managerial aspect; Lack of willingness; Space for both; Dialogue; Feedback.
Management Support	Guidance/Example; People management; Priorities; Discussion/Debate; Team integration; Technical competence; Availability of leadership/support; Work organization; Welcomes and promotes initiatives that enhance the climate; Recognition for the work done; Recognition of leadership and capability; "Defending" the team's employee; Involving employees in decision-making; Recognition, Praise; Advocating for your employee; Available time; Listening and communicating; Feedback; Infrastructure; Tranquility; Communication; Reciprocity; Security; Trust; Trust in guidance; Listening, Empathy, Respect; Work dynamics; Support in decisions.
Training	Generate growth opportunities; Leave for training, Opportunities; Technical understanding of changes and assess viability; Metrics for course participation; Application of knowledge covered in training; Offering training courses (Participation, Promotion); Survey sent to employees about desired training/interests; Ensures results and employee satisfaction; Budgetary resources; Execution capacity; Diversity of content/themes; Employee appreciation; Needs assessment; Return to the institution; Human and professional development; Promote changes; Sharing; Sensitization; Qualifies the work; Training.
Formalization	Necessary; Conduct; Transparency; Guidance; Evaluation; Study; Hierarchy; Procedures; Compliance/Behavioral standards; Establishment of rights, duties, obligations; Rationalization to avoid discomfort; Equity (rules are applied equally for everyone); Important for regulating activities; Safety in process development; Legality/Necessary bureaucracy; Rules reduce autonomy and limit action; Rules correct distortions; Dialogue, Communication; Division of responsibilities; Common sense, Justice, Innovation, Efficiency.
Resistance to Change	Training; Length of service; Inflexibility; Meritocracy; Modification of thinking with new functionalities; Employee resistance to changes/updates; Lack of training (employees who have been in the institution longer); Rituals/Rites propagating values and mission; Tradition versus New Norms; Openness to innovation; Clash of cultures (New versus Old); Inhibits initiative; Attachment due to fear of feeling undervalued; Is it easy to change practices that don't work?; Where does the need for changes come from?; Average time/Ease of changes; Frequency of reviewing practices and rules; Changes are externally provoked (laws) or internally; Updating and revising practices for efficiency; Responsibility versus Resistance to change; Uncertainties; Culture; Innovation; Changes.

Public Value	Organization's performance and its importance; Promotion of activities carried out; Sense of pride/Belonging; Service complaints (Negative Impact); Communicate with society; Defense of public service; Recognition of one's work; Understanding the entire process; Sense of work; Addressing public issues; Impacts of the activity; Delivery to society; Ownership; Recognition; Delivery to society; Belonging; Organization promotion; Organization's goals and objectives; Organizational policy; Dissemination of goals and objectives.
Organizational Clarity	Well-established formal communication; Daily activity versus institutional mission; Participation, involvement in defining; Justice, transparency, appreciation; Equity; Daily activities; Knowledge and priority: everything that is a priority has no ordering; Well-defined formal organizational communication; Communication; Quantity of questions about a particular subject/norms/communications; Frequency with which the organization's reason for existence is referenced internally; Priorities; Participation; Something tangible; Clear information; How important is my daily activity to my organization; Fulfilling its mission; Setting goals, except for atypical ones, to improve activity execution; Understanding the function one performs, their role as part of the process; Is the development of work transparent, clear?
Inefficiency	Leadership/managerial support; Planning disconnected from reality; Actions/Measures to prevent inefficiency; Resource scarcity/same workload; Satisfaction; Low self-esteem; Training; Tradition; Lack of clear evaluation mechanisms; Lack of communication within the team; Errors, conflicting/distorted information; Work organization/Ineffective tools; Goal monitoring with direct support from leadership; Lack of work; Well-defined workflows; Rework; Accountability; Employee overload; Resource availability; Delayed deliveries; Organizational clarity.
Professional Acting	Socialization; Training; Understanding; Clarity; Well-defined goals/Supervisory monitoring; Predefined competencies; Professional recognition/Appreciation; Job description (Restrictive?) versus Performance (Job deviation); Clear deliverables and goals; Possibility of promotions; Professional appreciation; Institutional recognition; Recognition by management of innovative initiatives; Weight of management for recognition; Employee feels capable of performing their job; Adequate development conditions; Mastery of activities; Effective recognition; Sense of belonging; Involvement with work.
Performance	Incentive mechanism; Employed criteria; Continuous assessment; Opportunity for improvement; Familiarity with expectations; Dialogue; Fair evaluation; Clear employment contract; Degree of fairness; Knowledge; Agreement; Change tool; Opportunity to assess and propose changes; Feedback: Reinforcement of the positive; Utilize the performance evaluation process; Performance evaluation; Mastery of activities and effective recognition; Improve or enhance the work structure.
Diversity	Inclusion; Sensitivity; Understanding; Inclusive management; Preparation and training to correctly address differences; Emotional intelligence to deal with personal differences; Employee perception regarding opportunities for diversity; Adopt effective actions regarding diversity; Inclusive diversity; Technical capability; Professional development; Veiled Decisions/Actions.

Appendix B. OCPS-PS Items

Dimension	Item
Autonomy	<ol style="list-style-type: none"> 1. My boss allows me to make relevant decisions about the work I do. 2. My boss allows me to organize how the work is done. 3. I have autonomy to solve problems that arise during the execution of my work. 4. My autonomy in task execution is hindered by the rigidity of the rules. ^b
Interaction and Cooperation	<ol style="list-style-type: none"> 5. Collaboration among employees from different departments is effective. 6. There are cooperative interactions among employees from different departments. 7. The development of activities allows for friendly interactions with other employees. 8. Employees can openly discuss any work-related issues with their supervisors. ^c 9. There is a harmonious atmosphere among employees in my department. ^c 10. Informal relationships among employees contribute to the improvement of the organizational climate. ^c 11. The organization responds quickly to cases of interpersonal conflict. ^c

Participation	<p>12. In this organization, employees participate in decisions that affect them.</p> <p>13. Managers involve employees when changes that affect them are implemented.</p> <p>14. In this organization, decisions are widely shared.</p> <p>15. In this organization, the concentration of assigning the same people for activities overburdens the employees who make themselves available to participate. ^b</p> <p>16. In this organization, the level of interest of employees in participating in decisions affects the organizational climate. ^b</p> <p>17. The political appointment of employees to participate in committees and/or projects reduces my effective possibilities to contribute to the organization's decisions. ^b</p>
Management Support	<p>18. My boss establishes friendly relationships with subordinates.</p> <p>19. My boss encourages training and development actions. ^c</p> <p>20. My boss promotes measures that encourage the psychological safety of subordinates.</p> <p>21. My boss recognizes a job well done.</p> <p>22. My boss is committed to improving working conditions.</p> <p>23. My boss communicates decisions made widely.</p> <p>24. My boss encourages the involvement of subordinates in meeting goals.</p> <p>25. My boss demonstrates trust in their subordinates.</p> <p>26. My boss makes time available to listen to their subordinates.</p>
Training	<p>27. Employees prioritize participation in training that promotes career advancement. ^c</p> <p>28. Management encourages participation in training that assists in achieving institutional goals. ^c</p> <p>29. Employees are strongly encouraged to develop their skills. ^c</p> <p>30. This organization provides sufficient resources for the development of employees' competencies.</p> <p>31. In this organization, training and development actions are consistent with the duties of employees' positions.</p> <p>32. In this organization, there are clear criteria for supporting training and development actions.</p>
Formalization	<p>33. In this organization, work requires adherence to high standards of quality and precision. ^b</p> <p>34. In this organization, the existence of formal procedures contributes to improving the work environment.</p> <p>35. In this organization, the employee's work is restricted to activities inherent to their position. ^b</p> <p>36. In this organization, the formalization of work rules reduces conflicts in the workplace.</p> <p>37. The prevalence of formality in interactions contributes to maintaining a healthy climate between sections.</p>
Resistance to Change	<p>38. In this organization, the way of doing work changes very slowly.</p> <p>39. In this organization, management is not interested in trying new ideas.</p> <p>40. In this organization, organizational changes happen very slowly.</p> <p>41. In this organization, traditional ways of performing activities are valued. ^c</p>
Public Value	<p>42. In this organization, the work performed positively contributes to the development of society. ^c</p> <p>43. This organization seeks to address the demands of society in its planning.</p> <p>44. Employees are concerned with improving ways to serve citizens. ^c</p> <p>45. The fact that this organization has positive impacts on society is a source of fulfillment for employees. ^c</p> <p>46. In this organization, the needs of society are considered top priorities.</p> <p>47. This organization responds quickly to the needs of society.</p> <p>48. I am proud to work for this public organization. ^c</p>
Organizational Clarity	<p>49. Employees have a good understanding of what the organization is seeking to achieve.</p> <p>50. The organization's planning is clearly communicated to everyone.</p> <p>51. In this organization, roles and responsibilities are clearly defined.</p> <p>52. Employees have clarity about their responsibilities for achieving organizational objectives.</p> <p>53. In this organization, implemented changes are widely communicated.</p>
Inefficiency	<p>54. The way financial resources are spent in this organization is inefficient. ^c</p> <p>55. Activities could be done much more efficiently if people took the time to think. ^a</p> <p>56. Poor scheduling of activities often results in unmet goals. ^c</p> <p>57. Productivity could be improved if job responsibilities were fulfilled.</p> <p>58. In this organization, the lack of transparency in decisions hinders administrative efficiency.</p> <p>59. Lack of impartiality contributes to the inefficiency of this organization.</p> <p>60. In this organization, the internal communication process is inefficient.</p> <p>61. Poor distribution of the workforce hampers the organization's performance. ^c</p>

Professional Acting	62. In this organization, employees always perform to the best of their abilities. 63. In this organization, employees are familiar with the tools, technologies, and resources available to deliver quality work. 64. In this organization, employees are willing to make an extra effort to do a good job. 65. In this organization, some employees dedicate more effort than others to do a good job. ^b
Performance	66. In this organization, employees always perform to the best of their abilities. 67. In this organization, employees are familiar with the tools, technologies, and resources available to deliver quality work. 68. In this organization, employees are willing to make an extra effort to do a good job. ^c 69. In this organization, some employees dedicate more effort than others to do a good job. ^c 70. Employees are encouraged to meet established goals.
Diversity	71. In this organization, regardless of position, all employees are respected. 72. In this organization, employees' conduct adheres to the principle of impersonality. ^c 73. In this organization, employees feel included. 74. In this organization, sufficient resources and time are invested in diversity-related actions. ^c 75. In this organization, prejudiced actions are punished. ^c 76. In this organization, employees feel that there is no prejudice. ^c 77. In this organization, the principle of equality prevails. 78. In this organization, ethical principles are respected. 79. In this organization, employees are treated fairly. 80. In this organization, employees are prepared to handle diversity. ^c

Legend: removed items (^a, study 2; ^b, study 3; ^c, study 4).

Appendix C. Correlations between OCPS-PS Errors

Correlations	Values	Significance
e43↔e47	0.290	***
e12↔e13	0.362	***
e66↔e67	0.275	***
e70↔e24	0.252	***
e51↔e52	0.453	***
e49↔e52	0.323	***
e51↔e49	0.128	***
e25↔e26	0.194	***
e20↔e24	0.142	***
e21↔e18	0.162	***
e58↔e39	0.234	***
e77↔e12	0.199	***
e53↔e14	0.274	***
e63↔e40	0.333	***
e62↔e46	0.274	***
e2↔e18	0.213	***
e22↔e40	0.309	***
esu↔eaut	0.489	***
ede↔eatu	0.369	***
etra↔einef	0.314	***

epar↔einef	0.333	***
eaut↔ediv	0.233	***
efor↔eaut	0.226	***
etra↔eatu	0.257	***
einef↔ediv	0.227	***
etra↔eva	0.183	***
eva↔esu	0.179	***
epa↔eva	0.233	***
esu↔eint	0.182	***

Note: *** Sig < 0.01, significant at 1%.

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