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Confirmatory and Exploratory Analysis of the Questionnaire to Evaluate the Disposition towards Organizational Change (CEDCO)

Mónica García-Rubiano [1], Carlos Forero-Aponte [1], Miguel Á. Mañas-Rodríguez [2], Pedro A. Díaz-Fúnez [2] , Rubén Trigueros [3],* and José M. Aguilar-Parra [3],*

[1] Department of Psychology, Catholic University of Colombia, Av. Caracas, 46, Bogotá 111311, Colombia; mgarcia@ucatolica.edu.co (M.G.-R.); cforero@ucatolica.edu.co (C.F.-A.)

[2] Research Team of the Department of Psychology and IPTORA, University of Almería, Ctra. Sacramento S/N, 04120 Almería, Spain; marodrig@ual.es (M.Á.M.-R.); pfunez@ual.es (P.A.D.-F.)

[3] Department of Psychology, Hum-878 Research Team, Health Research Center, University of Almería, Ctra. Sacramento S/N, 04120 Almería, Spain

* Correspondence: rtr088@ual.es (R.T.); jmaguilar@ual.es (J.M.A.-P.)

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Abstract: This article shows the results of two processes that corresponded to exploratory and confirmatory analyses of the Questionnaire to Evaluate the Disposition towards Organizational Change (CEDCO). The overall sample consisted of 1554 people. The first process considered 489 participants, and provided evidence of the multidimensionality of the test on three levels. The second process involved a sample of 1065 people, and provided evidence for appropriate fit values for the model that were consistent with the initial proposal for the test on three levels of evaluation: individual, group, and organizational. The results suggest the need to evaluate the practice using other mathematical models to address the biases that exist in some item distributions.

Keywords: organizational change; exploratory analysis; confirmatory analysis

1. Introduction

Organizational change is defined as a series of processes aimed at transforming the practices of organizations. These organizational practices are carried out by workers, who must adapt their behaviors for the practices to be realized [1]. It can also refer to the transformation that organizations require to remain competitive because it allows them to evolve and engage in the search for continuous improvements [2]. Organizational change is considered a multifaceted phenomenon in contemporary organizational theory [3]. Its relationship with adaptability is evident in the need to survive and develop in the face of the challenges of an increasingly competitive world for both workers and organizations [4,5].

According to González [6], organizational change refers to a structure composed of three aspects: (a) systemic, (b) multilevel, and (c) nonlinear. The first relates to values, demographic variables, and competitive dynamics in society; the second refers to the behavior of the individual, the group, and the organization, which interact in the generation of processes and results; and, finally, the third involves both the progression and the possibility of reversal and non-concurrency of transformations, allowing the appearance of fuzzy structures that are sometimes difficult to predict. Each of these aspects is relevant for various fields of study from different perspectives: the systemic aspect is consistent with the interests of sociology; the multilevel aspect can be analyzed from the psychological viewpoint considered in this article, and the nonlinear aspect is of interest for systems based on fuzzy logic.

The multilevel aspect has been taken into account in several previous studies conducted by the authors of the current article; for example, Rubiano and Aponte [7] identified the psychological aspects of organizational change as a dynamic construction, with three levels of behavior: (a) individual, (b) group, and (c) organizational. According to King and Anderson [8], the individual level relates to personality factors based on experiences prior to organizational change, including attitude, acceptance, endurance and motivation; the group level refers to network activities and the use of worker capacities that favor intervention in change processes, and are fundamental to communication and leadership; lastly, the organizational level involves factors such as the structure of the organization, climate, culture, and strategy.

Each of these three levels and the variables that they comprise have been explored in multiple studies showing different degrees of relationship between organizational change and other variables. The variables of the individual level have been used to examine attitude [9], motivation [10], motivation and satisfaction [11], organizational justice [12], psychological contracts [13], quality of working life [14], stress and psychological contracts [13]; the variables of the group level have been used to study leadership [14], communication [15], and teamwork [16]; and the variables of the organizational level have been used to study with organizational climate, stress, and culture [17].

The studies noted above, amongst others, have used different tools to evaluate the disposition towards organizational change. However, few researchers have referred to the metric properties of these instruments or the mathematical procedures used to calculate them. For example, García-Chacón [18] proposed the development of a series of instruments composed of factors with a qualitative scale and a quantitative scale. A modified instrument was proposed for each of the three types of the identified stakeholders (sponsor, agent, or exchange target); however, the psychometric properties of the process were not reported.

Bouckenooghe, Devos, and Van Den Broeck [19] conducted research about the metric conditions of tests, to measure the disposition towards organizational change. They designed a self-reported survey (i.e., an organizational change questionnaire of the climate of change, processes, and preparation) to assess the internal context or climate of change, and the factors underlying the change process and the preparation for change. The report presented the results of three studies evaluating content validity, internal consistency, and exploratory and confirmatory analyses. The survey consisted of 42 items and 11 dimensions, and was designed using a Likert scale with categories between 1 and 5. Internal consistency was evaluated using Cronbach's alpha, resulting in values between 0.68 and 0.89. Variations were made with respect to the number of appropriate dimensions, finally concluding with the 11 mentioned in the test. The greatest strength of these instruments related to the ecological validity obtained as a result of their application in different contexts (Netherlands, Germany, and England).

Husain and Farooq [20] designed a test to measure the performance of change, and devised a Balanced Scorecard for Hindi business organizations. This test examined four categories of organizational change and four balanced scorecard tables consisting of 41 factors grouped into eight categories. Internal consistency was evaluated with Cronbach's alpha (with resulting values between 0.59 and 0.89), and the content validity and one-dimensionality of the test were also assessed. Exploratory factorial analysis identified 16 dimensions with an explained variance of 97.12%, using the main component method and factorial analysis with promax rotation. Finally, they proposed a confirmatory analysis based on structural equations with independent metric indicators of change conditions and the balance scorecard.

For Colombia, a few studies have assessed the metric conditions of tests to evaluate the disposition towards organizational change. One example is the research of García, Rubio, and Bravo [21], who measured the disposition towards organizational change with a test consisting of a Likert-like scale of 55 items, with five response options each, distributed across twelve subvariants; internal consistency measured by Cronbach´s alpha was 0.84. This instrument was revised and adjusted by García and Forero [22], resulting in a new structure consisting of nine main variables, three first-order factors, and two second-order factors, with an internal consistency of 0.86 obtained using Cronbach´s alpha.

The current research continues the development of the test designed and presented by the authors in 2016, namely the Questionnaire to Evaluate the Disposition towards Organizational Change (CEDCO) [23]. This test comprises three levels (individual, group, and organizational), described as follows: (a) The individual level relates to acceptance and motivation. Acceptance refers to those reactions that give rise to passive support for change processes. This is evident when workers agree to participate in the activities that are generated; however, workers also see the process as inevitable and accept that it is necessary to adjust to the change to continue in the entity. This can generate active support, in which workers take the initiative to participate in the processes of change and increase the behaviors in favor of these processes [24]. Motivation is understood as the psychological processes that influence a person to direct and persist in voluntary actions towards the achievement of organizational objectives; these processes are conditioned by the capacity or effort of the person to meet their individual needs or achieve a specific goal [25]. (b) The group level relates to communication and leadership. Communication is seen as an important function in any organization, because many processes of change fail due to a lack of necessary attention. Communication should be persuasive rather than imposing, and is characterized by being optimal, simple, complete, coherent, and structured [26]. Leadership is understood as the interpersonal influence exerted by a leader on his followers in a given situation, and is directed through the process of human communication towards the realization of one or more objectives [27]. (c) The organizational level relates to knowledge, climate, and culture. Knowledge is understood as the ability of organizations to generate new knowledge. Organizations aim to disseminate knowledge among workers, seeking to materialize it in products, services, and systems [28]. Climate has a close relationship with the processes of change, because interpersonal relationships influence the movement of human relations [19]. According to Dolan García and Auerbach [29], culture is essential for changes to transcend, since this must constitute a cultural redefinition of the essential values that make up the shared identity of members within an organization.

This article presents the metric characteristics examined using the Questionnaire to Evaluate the Disposition towards Organizational Change (CEDCO) [23]. The paper first discusses the exploratory level before turning to the confirmatory level.

2. Methods

2.1. Participants

The participants in this study were divided into two independent samples, selected and assigned using a self-selective non-probabilistic sampling design (see Table 1). As inclusion criteria, signed informed consent was required, and participants were required to be economically active. Potential candidates were excluded if the person was under 18 years old, more than 80 years old, or failed to answer more than 5% of the test items.

Table 1. Sociodemographic characteristics of the two samples analyzed.

	Mean Age (Standard Deviation)	Mean of Time Working in a Company	Distribution Sample	Education Level	Civil Status	Age Range
Exploratory Factor Analysis (AFE)	37.96 (SD = 12.1)	6.41 years (SD = 7.69)	248 Men; 236 Women and 5 Unknown $N = 489$	Primary = 12; High school; = 38 Technician/Technologist = 150; Undergraduate = 113; Graduate = 175; Unknown = 1	Single = 228; Married = 147; Living common law = 73; Separated/Divorced = 36; Widowed = 2; Unknown = 3	18–80
Confirmatory Factor Analysis (CFA)	37.27 (SD = 11.4)	6.14 years (SD = 7.20)	518 Men; 537 Women and 10 Unknown $N = 1065$	Primary = 12; High school; = 83 Technician/Technologist = 314; Undergraduate = 252; Graduate = 398; Unknown = 6	Single = 494; Married = 327; Living common law = 166; Separated/Divorced = 38; Widowed = 4; Unknown = 6	18–74

2.2. Instruments

The Questionnaire to Evaluate the Disposition Towards Organizational Change (CEDCO in Spanish) is an original test developed by Forero et al. [23] consisting of six categories measured using a Likert scale, in which one (1) was total disagreement and six (6) was total agreement. The survey initially comprised a total of 74 items, of which 22 were eliminated in the pilot phase and five in the validation phase. The final test comprised 47 items, distributed across the three levels: (a) individual level—17 items (13 with inverse rating and 4 with direct rating); (b) group level—14 items (6 inverse grade and 8 of direct grade); and (c) organizational level—16 direct grading items. The test was analyzed under the Rash model of the IRT (item response theory), where it showed one-dimensionality with an explained variance of 27.9. Cronbach's internal alpha consistency fluctuated between 0.73 and 0.85 for the three levels; in the sub variables, Cronbach's alpha internal consistency values ranged from 0.85 to 0.97 (see Appendix A).

2.3. Procedure

Once the reliability characteristics of the test and the final structure were determined, final adjustments were made to the wording of some of the elements. The collaboration of several private sector companies was requested to distribute the survey, until a sample size of 1554 people was obtained. The sample was divided into two parts following the recommendation of Lloret-Segura, Ferreres-Traver, Hernández-Baeza, and Tomas-Marco [30] for the type of analysis undertaken in this study. The exploratory factor analysis (EFA) was performed with 31.5% of the total (489 people) and the confirmatory factor analysis (CFA), with 65.5% of the total (1065 people).

2.4. Data Analysis

Initially, the factor structure was analyzed through an exploratory factor analysis (EFA); then, the factor structure was analyzed through a confirmatory factor analysis (CFA). For the first process, descriptive statistics were obtained for each of the items, and subsequently, a normality analysis was performed with the Kolmogorov–Smirnov test. This test was deemed appropriate given the number of participants and because the survey, despite being ordinal, responded to more than five values per score on each element. For factor estimation, the Generalized Least Squares (GLS) method was used, as the data did not exhibit normal behavior, and oblique rotations were used as the results allow for a relevant evaluation, even when they are not adequate [30]. The statistical software SPSS 25 was used in this part of the process.

After the EFA was conducted and the results indicated the existence of multidimensional behavior consistent with the theoretical foundations of the three main axes of analysis (individual, global, and organizational), the CFA was conducted on the 47 items of the test. Descriptive statistics and normality were obtained for each of the elements, in addition to multi-normalcy, according to the recommendations of Herrero [31]. As a reference value, a range between −2 and 2 was assumed for both bias and kurtosis. It was found that most of the elements tended to be normal, except for items 2, 13, and 14, which had values outside the reference range for kurtosis. The multivariate kurtosis value was 799.326, suggesting that the behavior was far from a multivariate normal. The information was contrasted with the Mahalanobis distance assessment, in which outliers were evident. Given the absence of normality, the recommendation of Arias [32] to perform CFA and to carry out the least square analysis with AMOS 24.0 software was adopted.

3. Results

3.1. Exploratory Factor Analysis

The scores for each element were expressed in a series of categories between 1 and 6, as described above. Table 2 shows that the average scores of the elements were above 3, and in 61.7% of cases were above 4; point 14 had an average score greater than 5. The analysis of bias and kurtosis was

conducted, finding that only three of the 47 elements had absolute values greater than 2 for kurtosis in each case, while none exceeded this range in asymmetry. The highest absolute value for asymmetry, of 1.5, was found for point 2.5, while for kurtosis it was found to be 2.28 for point 14. These aspects constitute additional evidence regarding the non-normality of the score distributions of the items. The behavior of the results is consistent with other research in which the test was used [13,23].

Table 2. Descriptive statistics of the items in the Questionnaire to Evaluate the Disposition towards Organizational Change (EFA; *n* = 489).

Item	Mean	Sd	Asymmetry	Kurtosis	Item	Mean	Sd	Asymmetry	Kurtosis
IMC1	3.81	2.00	−0.32	−1.57	IMC25	4.38	1.57	−0.60	−0.84
IMC2	4.95	1.21	−1.50	1.95	IMC26	4.22	1.56	−0.48	−0.92
IMC3	4.53	1.34	−1.01	0.40	IMC27	4.06	1.55	−0.37	−0.95
IMC4	4.58	1.21	−0.99	0.76	IMC28	4.17	1.53	−0.45	−0.88
IMC5	4.81	1.12	−1.23	1.51	IMC29	4.19	1.54	−0. 56	−0.76
IMC6	4.55	1.28	−1.03	0.63	IMC30	4.85	1.16	−1.17	1.35
IMC7	3.19	1.53	0.42	−0.87	IMC31	4.77	1.18	−1.01	0.68
IMC8	3.98	1.47	−0.54	−0.63	IMC32	4.79	1.18	−1.08	1.04
IMC9	4.81	1.10	−1.16	1.54	IMC33	4.72	1.22	−1.03	0.75
IMC10	3.28	1.72	0.28	−1.24	IMC34	4.64	1.22	−0.97	0.68
IMC11	3.82	1.54	−0.44	−0.87	IMC35	4.61	1.19	−0.95	0.75
IMC12	4.51	1.13	−0.90	0.74	IMC36	3.53	1.75	0.14	−1.40
IMC13	4.85	1. 05	−1.31	2.11	IMC37	3.60	1.62	−0.16	−1.01
IMC14	5.02	1.08	−1.47	2.28	IMC38	4.26	1.32	−0.79	0.08
IMC15	3.40	1.76	0.19	−1.36	IMC39	4.22	1.34	−0.69	−0.12
IMC16	3.95	1.57	−0.21	−1.14	IMC40	4.24	1.32	−0.75	0.07
IMC17	4.21	1.59	−0.38	−1.07	IMC42	3.69	1.67	0.05	−1.29
IMC18	3.94	1.64	−0.22	−1.20	IMC43	4.13	1.72	−0. 58	−0.99
IMC19	4.08	1.56	−0.29	−1.11	IMC44	3.74	1.96	−0.13	−1.59
IMC20	4.07	1.54	−0.27	−1.08	IMC45	3.60	1.81	−0.24	−1.38
IMC21	3.48	1.53	0.20	−1.04	IMC46	3.83	1.78	−0.12	−1.45
IMC22	3.81	1.50	−0.04	−1.10	IMC47	3.68	1.75	−0.31	−1.24
IMC23	4.53	1.64	−0.87	−0.57	IMC48	4.92	1.13	−1.39	2.00
IMC24	3.37	1.84	0.11	−1.44					

Regarding the adequacy of the data for factor analysis, the Keiser–Meyer–Olkin (KMO) and Bartlett's sphericity tests were used. KMO values were considered satisfactory (0.942), which implies that it is possible to factor in the correlation matrix. Furthermore, the result of Bartlett's test indicates that the correlation matrix did not come from an identity matrix that makes the EFA realization feasible (x^2 = 16,892; df = 1081; $p < 0.000$).

From the results expressed above, a scree plot was drawn (Figure 1) in which it can be observed that six factors have values greater than 1, but only three are above 2, while the remaining three have similar values; the difference between the first three values and the remaining values is evident. Higher values explain 53.04% of the variance, and the first factor represents 24.68%, which is sufficient to consider the test in terms of its multidimensional character and provides an argument in favor of conducting a CFA. The communities fluctuated between 0.5 and 0.86, thus representing a high value in all elements, and indicating that the variables were adequately represented in the factor space.

Based on the results above, the factorial structure was constructed from three factors, in which only factorial loads with absolute values greater than 0.30 were considered. As can be seen, this allowed the 47 evaluated elements to be grouped into the three factors mentioned. For the first factor, the values ranged from 0.491 to 0.874, and it consisted of 17 items; the second factor had values between 0.441 and 0.827 and consisted of 19 items; and the third factor had values between 0.598 and 0.791 and consisted of 11 items (see Table 3).

The extracted factors were consistent with the individual, group, and organizational levels of the Questionnaire to Evaluate The Disposition towards Organizational Change, and thus consistent

with the theoretical structure proposed in the introduction of this test. The current factorial solution was obtained using the least square's method with oblimin rotation, because it presented the best adjustment models compared to other rotations, such as quartimax and promax. The results were consistent with the levels mentioned by King and Anderson [XX]; however, they did not show evidence to support the distribution of subvarieties in a specific way, as originally proposed in the design of the instrument.

Correlations between factor 1 vs. factors 2 and 3 were low, and the correlation between factor 2 and factor 3 was mean low (see Table 4). This result may be due to trends in scores given by respondents, who were restricted in relation to the range of possible item scores. For this research, these correlations were used as an AFE result to explore possible solutions in the CFA. However, it is advisable to consider the correlations presented here compared to other types of populations.
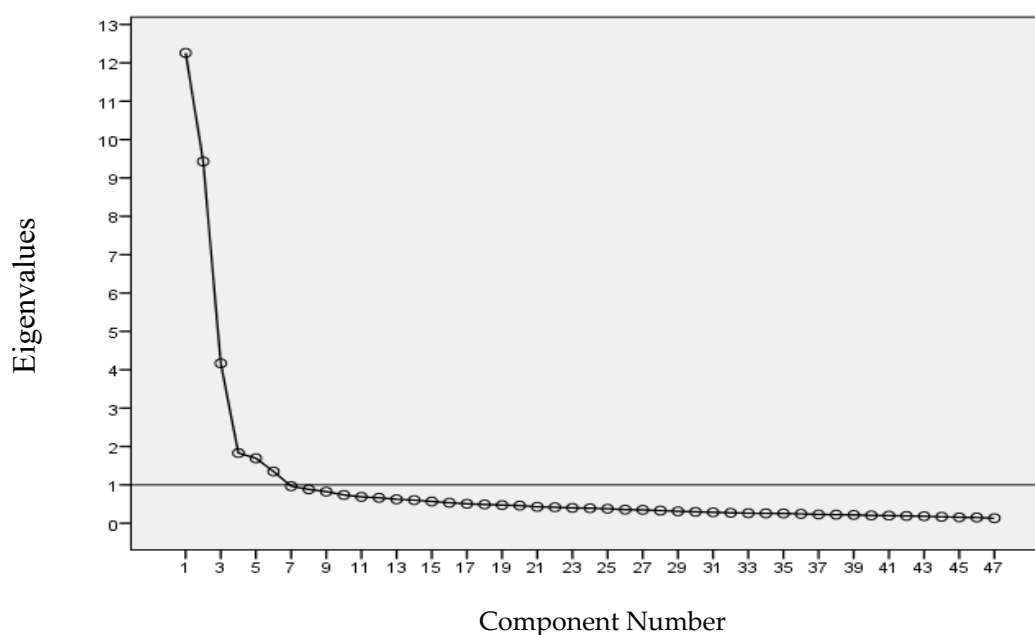

Figure 1. Scree plot for the 47 elements of the Questionnaire to Evaluate The Disposition towards Organizational Change.

Table 3. Factorial structure of the Questionnaire to Evaluate the Disposition towards Organizational Change.

			Structure Matrix				
		Factor					
	1	2	3		1	2	3
IMC44	0.87			IMC39		0.68	
IMC1	0.85			IMC12		0.67	
IMC43	0.83			IMC38		0.66	
IMC46	0.82			IMC5		0.63	0.33
IMC23	0.81			IMC6		0.62	0.31
IMC24	0.80			IMC4		0.61	
IMC15	0.80			IMC2		0.60	0.31
IMC45	0.77			IMC3		0.58	0.33
IMC44	0.87			IMC39		0.68	
IMC1	0.85			IMC12		0.67	
IMC43	0.83			IMC38		0.66	
IMC46	0.82			IMC5		0.63	0.33

Table 3. *Cont.*

Structure Matrix						
	Factor					
	1	2	3		1	2	3
IMC23	0.81			IMC6		0.62	0.31
IMC24	0.80			IMC4		0.61	
IMC15	0.80			IMC2		0.60	0.31
IMC45	0.77			IMC3		0.58	0.33
IMC47	0.77			IMC9		0.57	
IMC36	0.76			IMC14		0.56	
IMC10	0.75			IMC13		0.52	
IMC42	0.74			IMC48		0.44	
IMC29	0.70			IMC26	0.34	0.79
IMC11	0.69			IMC25	0.31	0.76
IMC8	0.56			IMC20		0.69
IMC37	0.55			IMC16	0.34	0.69
IMC7	0.49			IMC19	0.38	0.68
IMC32		0.83		IMC17		0.67
IMC34		0.82		IMC27	0.43	0.66
IMC35		0.82		IMC22	0.36	0.63
IMC31		0.80		IMC18	0.34	0.63
IMC33		0.79		IMC28	0.33	0.62
IMC30		0.75		IMC21		0.60
IMC40		0.69				

Table 4. Correlations between broken factors.

Factor	1	2	3
1	1.000		
2	0.107	1.000	
3	0.041	0.319	1.000

3.2. Confirmatory Factor Analysis

The scores of each element were expressed in a series of categories between 1 and 6, which were distributed under the criteria that were described above. In Table 4, it can be observed that the average score of the elements was above 3 and in 64% of cases was above 4. Items 2 and 14 had average scores greater than 5, which is consistent with the results obtained in the AFE. The results in terms of bias, kurtosis, and standard deviations also demonstrated behaviors (Table 5).

The scores obtained are consistent with other studies conducted by Forero et al. [23] and García and Forero [13], in terms of the tendency of those evaluated to be placed at high scores above three. This observation also applies to bias and kurtosis, whose values in previous articles are consistent with the values evaluated in the present study [12]. This implies a pattern of behavior in the responses given in the evaluation of organizational change by employees of different organizations.

Table 5. Descriptive statistics of the elements of the Questionnaire to Evaluate the Disposition towards Organizational Change. (CFA; *n* = 1065).

Article	Say	Sd	Asymmetry	Kurtosis	Item	Say	Sd	Asymmetry	Kurtosis
IMC1	3.88	2.00	−0.41	−1.51	IMC25	4.45	1.44	−0.61	−0.64
IMC2	5.03	1.07	−1.50	2.52	IMC26	4.31	1.48	−0.48	−0.87
IMC3	4.46	1.34	−0.93	0.26	IMC27	4.26	1.54	−0.45	−0.93
IMC4	4.52	1.25	−0.91	0.42	IMC28	4.12	1.53	−0.29	−1.07
IMC5	4.74	1.16	−1.16	1.22	IMC29	4.13	1.56	−0.62	−0.69
IMC6	4.45	1,24	−0.96	0.55	IMC30	4.73	1.21	−1.09	0.89
IMC7	3.28	1,54	0.37	−0.87	IMC31	4.70	1.23	−1.10	0.97
IMC8	3.90	1,43	−0.49	−0.65	IMC32	4.75	1.20	−1.12	1.06
IMC9	4.74	1,14	−1.13	1.31	IMC33	4.68	1.22	−1.04	0.74
IMC10	3.39	1,69	0.20	−1.19	IMC34	4.58	1.24	−0.90	0.36
IMC11	3.81	1,48	−0.51	−0.73	IMC35	4.52	1.25	−0.88	0.33
IMC12	4.38	1,21	−0.83	0.34	IMC36	3.64	1.66	0.05	−1.26
IMC13	4.84	1,06	−1.32	2.19	IMC37	3.48	1.54	−0.15	−1.08
IMC14	5.01	1,06	−1.55	2.80	IMC38	4.09	1.43	−0.64	−0.44
IMC15	3.49	1,70	0.11	−1.31	IMC39	4.01	1.43	−0.54	−0.61
IMC16	4.07	1.45	−0.25	−0.89	IMC40	4.14	1.37	−0.60	−0.37
IMC17	4.21	1.52	−0.39	−0.97	IMC42	3.82	1.66	−0.11	−1.29
IMC18	3.93	1.57	−0.22	−1.08	IMC43	4.10	1.71	−0.55	−1.02
IMC19	4.16	1.51	−0.32	−1.02	IMC44	3.98	1.91	−0.35	−1.45
IMC20	4.07	1.51	−0.31	−0.99	IMC45	3.62	1.75	−0.26	−1.29
IMC21	3.63	1.52	0.03	−1.05	IMC46	3.92	1.77	−0.25	−1.38
IMC22	3.89	1.48	−0.22	−0.93	IMC47	3.75	1.77	−0.34	−1.26
IMC23	4.53	1.63	−0.92	−0.45	IMC48	4.91	1.15	−1.33	1.79
IMC24	3.48	1.82	−0.01	−1.42					

Table 6 shows the goodness-of-fit values of the model that was most appropriate. However, some factors suggest the need to deepen the analysis by removing elements and adjusting the goodness criteria for the CFA. Although the RMSEA (root mean square error of approximation) was 0.048, and the values obtained for χ^2 and AGFI (adjusted goodness of fit index) suggested good or acceptable values, the CFI (comparative fit index) value was very low and thus not an adequate indicator with respect to model adjustment. According to Herrero (2010), the fact that the RMSEA and CFI do not have adequate overall adjustment values could be interpreted as an ill-fitted model. However, given the amount of data evaluated, it is understandable that the CFI values were low, because the sample and modelled function of the variables involved are highly complex.

Table 6. Goodness-of-Fit Model Statistics for the Questionnaire to Assess the Disposition towards Organizational Change.

Measurement	Threshold	Value
χ^2/df	3.456	<3, well; <5 permissible
CFI	0.269	>0.95, excellent; >0.90, acceptable; >0.80, sometimes acceptable
GFI	0.859	>0.95
AGFI	0.844	>0.80
RMSEA	0.048	<0.05 good; 0.05 < 0.1, moderate; >0.1 bad
PCLOSE	0.0968	>0.05

The model obtained is clearly complex and represents related factors that reflect the initial structure of the test, in addition to the levels mentioned by King and Anderson [8]. However, an analysis of the implications of the model at the theoretical level and a greater depth of statistical analysis are required.

As shown in Figure 2, the model consists of 97 variables; 47 observed and 50 unobserved; and 47 endogenous and 50 exogenous. The model hypothesizes the correlations between individual, group, and organizational level variables, with 1031 degrees of freedom. Standardized regression

weights fluctuated for the individual level between 0.51 and 0.74, for the group level between 0.47 and 0.80, and for the organizational level between 0.52 and 0.86. Although the correlations obtained were low, they were significant, given the number of cases considered in the analysis. The variance explained by the three factors corresponded to 52.79%. The rotation by the maximum likelihood method explained 49.57% and, in particular, increased the explained variance of the third factor (from 9.32% to 11.68%). The sedimentation and factor load of the elements in each of the factors did not vary from those of the EFA. As shown in Table 7, the internal reliability and consistency values of the test were high, which demonstrates the appropriate properties of each of the components, and of the test as a whole.

Table 7. Reliability and internal consistency of the Questionnaire to Evaluate the Disposition towards Organizational Change.

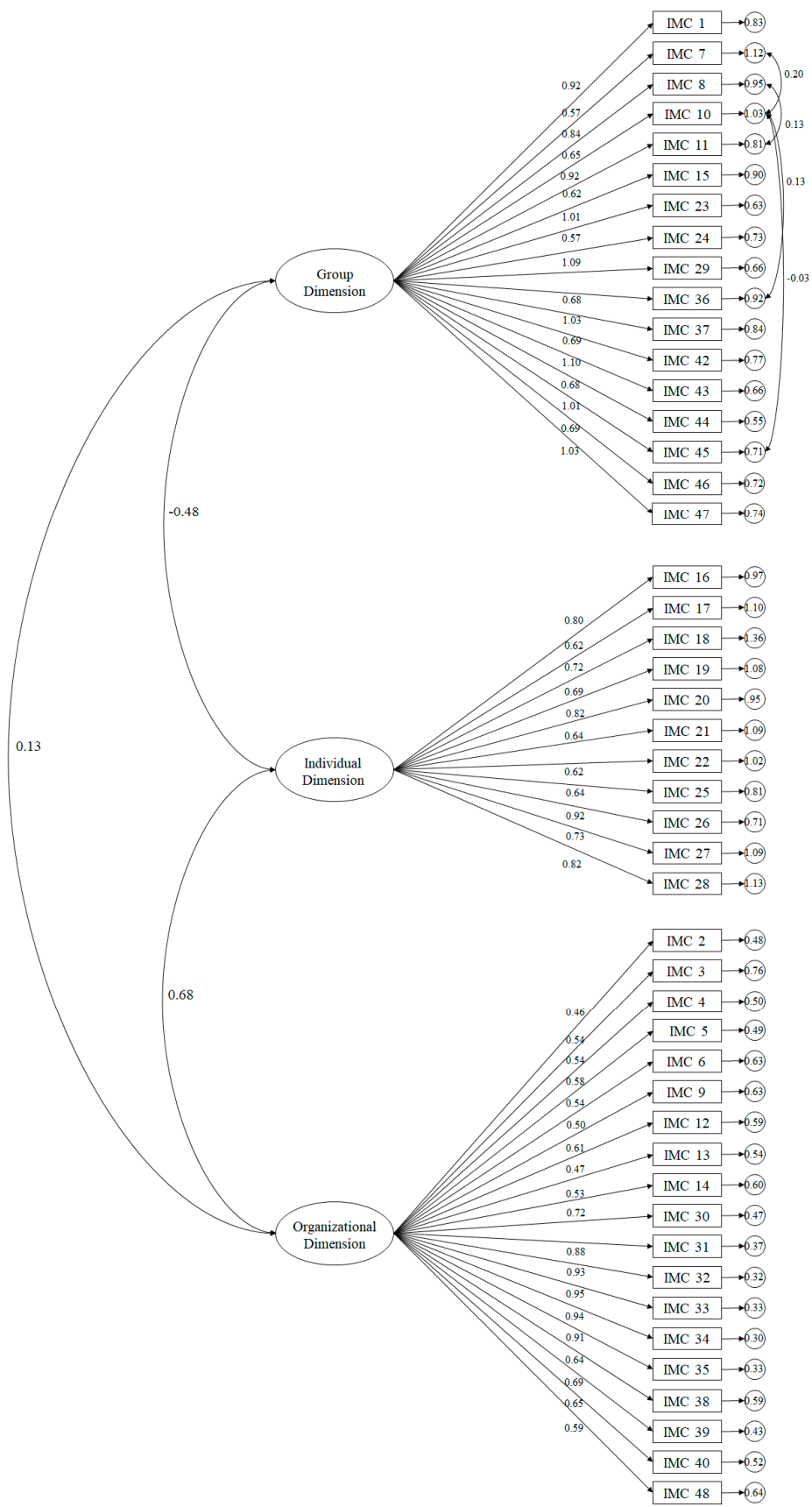| Factor	Cronbach's Alpha	Spearman Brown Coefficient
Individual	0.89	0.89
Group	0.95	0.95
Organization	0.93	0.86
Total	0.92	0.90

Figure 2. Three-factor CFA model.

4. Discussion and Conclusions

Initially, the results of the study established the metric characteristics of The Questionnaire to Evaluate the Disposition towards Organizational Change (CEDCO), thus meeting the central objective of the research. However, the results also showed that the evaluated responses tended to present bias in different items, resulting in most responses having heterogeneous scoring distributions and scores greater than 3, as reflected in the average values of the different items. This aspect is a factor to be analyzed in future research.

Regarding the structural composition of the test, evidence was obtained in favor of the three macro aspects described in the theoretical framework (individual, group, and organizational levels), but this was not the case in the evaluation of the specific variables of each of these levels. The identification and structuring of these subvariates are thus aspects to be evaluated in the future, since the blind results are contradictory to those of the test developed by Bouckenooghe, Devos, and Van Den Broeck [19], who obtained 11 dimensions from a test with 42 items, and previous work of García and Forero [13], in which they presented a test with five factors.

In this case, the individual level refers to individuals' experiences of and reactions to change (for example, item 16, The proposed changes generate a lot of burnout in my daily activities; item 17, New ways of working would prevent me from achieving my goals in the company). The group level relates to the composition, structure, and development of groups in organizations (for example, item 8, The generated change has allowed support in the relationships between coworkers; item 38, I dislike the way organizational change affects the balance and union of the group). The organization level refers to aspects of organizational structure, culture, and climate (for example, item 33, Change strengthens the sense of belonging of the employees towards the company; item 35, Organizational change has generated a greater link with the organization).

The results obtained in this study were not conclusive regarding the Questionnaire to Evaluate the Willingness towards Organizational Change, however, some aspects deserve to be highlighted. For example, the test provides evidence of a multifactorial structure composed of three levels consistent with the theory of King and Anderson [8], however, the evidence obtained in the evaluation of these variables does not completely support the conclusions made regarding the three levels.

The results showed consistency with the research of Forero et al., [23] in which metric analyses were carried out on the basis of the Rash model of the IRT, and allowed aspects related to validity and reliability to be strengthened. However, it is necessary to perform additional analyses that allow a structure in both factorial terms for the metric conditions of the test to be found. An important aspect is the restriction of elements that show important differences in the data and establish control over the presence of outliers that affect multi-normality.

To reduce the impact of outliers, different types of transformations (e.g., sinusoidal, inverse, or polynomial) can be used, as proposed by Arias [32], so that undesirable behaviors in the kurtosis of some variables are resolved. The nonlinear nature of the results means considering options other than orthodox approaches in such transformations.

The use of variable transformations has been implemented on other occasions with various results; for example, Rodriguez-Ayan and Ruiz-Díaz [33] used various types of transformations to assess the effects on the factorial structure of a test, to assess student opinion on university professors. In the AFE, they used square root transformation, Neperian logarithms, inverse, square, case assignment with Blom, and CatPCa normalization, using the SP procedure. They found that there was no substantial correction effect on the behavior of the data. Regarding the confirmatory factor analysis, they used the methods of rotation by the main components and oblimin in the different transformations. It was concluded that the logarithmic and inverse rotations are better able to attenuate bias, and they found that the type of estimation in the confirmatory analysis significantly affected the results.

A previous study by Linting, Meulman, Groenen, and Vander Kooij [34] evaluated the stability of nonlinear procedures in a principal component analysis, specifically through the use of non-parametric

statistics. The results showed the emergence of categories with small marginal frequencies; however, the results were not conclusive.

In general terms, it is recommended that the suggestions of Fabrigar, Weneger, McCallum, and Strahan [35] are taken into account, regarding the conditions for conducting both exploratory and confirmatory analyses in psychological research.

Regarding the impact of the research, despite the need to deepen the metric adjustment of the test, it is clear that it is an important tool for the evaluation of the disposition towards organizational change in Colombia and Latin America. A review of the literature showed that little previous research has been conducted for this purpose [12,13,23]. Research efforts in this regard have been presented previously in Europe and Asia. However, due to the difference in the cultural conditions of these regions, the lack of cultural adaptation of relevant instruments, and the absence of intercultural research that provides evidence on the difference or similarity of the concepts, it is clear that the use of European or Asian evidence in the specific context of Latin America and Colombia is inappropriate.

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Appendix A

ID	Ítem
1	Los cambios son positivos para el desarrollo de mi entidad Changes are positive for the development of my organization
2	La implementación de cambios contribuye con un mejor ambiente en la organización The implementation of changes contributes with a better environment in the organization
3	Me vinculo activamente con los procesos de transformación de mi entidad I actively link myself with the transformation processes of my entity
4	Los cambios en la organización favorecen mi desempeño laboral. The changes on my organization favor my job performance
5	El cambio organizacional me permite generar nuevas ideas para el trabajo. Organizational change allows me to generate new ideas for my job
6	A partir del proceso de cambio la comunicación que se ha generado con los colaboradores es buena As of the process of change, the communication that has been generated with the collaborators is good
7	Las relaciones interpersonales se han deteriorado, afectando la comunicación en los procesos de cambio Interpersonal relationships have deteriorated, affecting the communication in the change processes
8	El cambio generado ha permitido afianzar las relaciones entre los compañeros The generated change has allowed support in the relationships between coworkers
9	Considero el cambio como un proceso que promueve el beneficio común I consider change as a process that promotes common benefit
10	Pienso que el cambio realizado ha afectado al grupo de manera negativa I think the change realized has had a negative effect on the group
11	El agente de cambio permite que los colaboradores generen espacios para el desarrollo de sus actividades The change agent allows collaborators to generate spaces for the development of their activities
12	El agente de cambio desarrolla actividades que ayudan a implementarlo The change agent develops activities that help to implement it
13	Busco la forma de llevar a cabo nuevas estrategias para realizar las actividades del área de trabajo I look for a way to carry out new strategies to perform the activities in the job area

ID	Ítem
14	Es agradable realizar con mis compañeros actividades que permiten el desarrollo del cambio It's pleasant to do activities that allow the development of change with my coworkers
15	Las labores que desarrollo a partir del cambio generado, no me generan ninguna motivación The tasks I carry out from the generated change don't give me any motivation
16	Los cambios planteados, generan mucho desgaste en mis actividades diarias The proposed changes generate a lot of burnout in my daily activities
17	Nuevas formas de trabajar me impedirían alcanzar mis objetivos dentro de la empresa New ways of working would prevent me from achieving my goals in the company
18	Los cambios son insuficientes para estar satisfecho y trabajar motivado Changes are insufficient to be satisfied and work motivated
19	Me genera una baja motivación pensar que debo invertir mucho tiempo en la consecución de objetivos It lowers my motivation to think I have to invest a lot of time in the achievement of my goals
20	Cambiar la forma de realizar las actividades diarias requiere de un mayor gasto de tiempo y energía Changing the way of doing daily activities requires a greater use of time and energy
21	Siento que las conversaciones no son lo suficientemente completas para entender el cambio I feel that conversations aren't complete enough to understand change
22	Las conversaciones en el grupo no me aportan lo necesario para adaptarme al cambio organizacional The conversations on the group don't provide me with what I need to adapt to organizational change
23	Tener buenas relaciones a nivel grupal me permite una buena comunicación Having good relationships on a group level allow me to have good communication
24	Nuevas formas de trabajar no me permiten focalizar mi energía New ways of working don't allow me to focus my energy
25	Los cambios hacen que me sienta incomodo en la organización Changes make me feel very uncomfortable in the organization
26	El cambio en la forma de trabajar demanda más desgaste y agotamiento The change in the way of working demands a greater wear and tear
27	Lo que me ofrece la organización no me satisface I'm not satisfied by what the organization offers
28	Percibo de manera incompleta la información que se me brinda acerca de la nueva forma de trabajo I perceive in an uncomplete way the information given to me about the new way of working
29	Mediante el cambio organizacional, es posible resaltar los valores de la compañía Through organizational change it is possible to highlight the values of the company
30	El cambio promueve que se actúe acorde a los valores organizacionales Change promotes acting according to organizational values
31	Siento que el cambio organizacional ayuda a que me identifique más con la organización I feel that organizational change helps me identify more with the organization
32	El cambio organizacional favorece el proceso cooperativo en la organización Change favors the cooperative process in the organization
33	El cambio fortalece el sentido de pertenencia por parte de los empleados hacia la empresa Change strengthens the sense of belonging of the employees towards the company
34	El cambio organizacional ha ayudado a consolidar la cultura organizacional Organizational change has helped to consolidate organizational culture
35	Con el cambio organizacional se ha generado un vínculo más fuerte con la organización Organizational Change has generated a greater link with the organization
36	Me desagrada la forma como el cambio organizacional afecta la armonía y unión del grupo de trabajo I dislike the way organizational change affects the balance and union of the group

ID	Ítem
37	Conforme se desarrollan los cambios, la organización brinda recursos para enfrentarlo e indica su forma de uso According to the development of the changes, the organization provides resources to face them and indicates their way of use
38	Las capacitaciones brindadas por la organización son acordes a las necesidades durante el proceso de cambio organizacional The training provided by the organization corresponds to the necessities during the process of organizational change
39	La organización prevé los cambios y genera recursos y formación para su adecuado desarrollo The organization provides the changes and generates resources and formation for its adequate development
40	Durante el proceso de cambio, la organización me brinda los medios para potencializar mi conocimiento During the process of change the organization gives me the means to potentiate my knowledge
41	Los cambios hacen que mi interés en el trabajo se disminuya Changes make my interest in work decrease
42	La mejor decisión que se puede tomar es contribuir al desarrollo del cambio organizacional The best decision you can make is to contribute to the development of organizational change
43	Si adoptamos el cambio organizacional, fracasamos laboralmente If we follow the path of organizational change, we fail in terms of work
44	Mis tareas y objetivos se orientan al desarrollo del cambio organizacional My ideas or objectives orientate towards organizational change
45	Si contribuyo en el cambio organizacional es posible que me vea perjudicado If I contribute to organizational change it is possible that I will end up disadvantaged
46	Apoyar las actividades enfocadas al cambio organizacional garantizan su consecución To support activities focused on organizational change guaranties it's attainment
47	Para que el cambio organizacional sea significativo debo apoyar actividades propias de este I have to support prototypical activities of organizational change so that it can be significant

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