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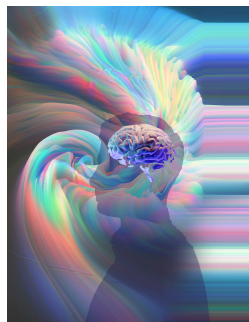
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The ECO VI Organizational Climate Scale: An Invariance Study in Four Latin American Countries

La escala de clima organizacional ECO VI: un estudio de invariancia en cuatro países de América Latina

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Abstract.

Introduction. Cross-cultural research is fundamental for the development and validation of work and organizational theories and to guide evidence-based practices around the globe. Although organizational climate is one of the most investigated higher-level constructs in organizational psychology, there is a lack of research analysing the invariance of measurements across national cultures in Latin America. This prevents scientists and practitioners from having a deeper understanding of this variable across the different countries and cultures composing this continent. **Objectives.** This study aims at examining the measurement invariance of the *Encuesta de Clima Organizacional* scale in its VI version (ECO VI) in Colombia, Costa Rica, Panama, and Dominican Republic. **Method.** Data were gathered from 38 companies operating in the manufacturing sector based in the four abovementioned countries and the sample sizes were as follows: Colombia was represented by 1007 employees, Costa Rica by 1090 employees, Panama by 372 employees, and Dominican Republic by 213. Measurement invariance was examined by testing the configural, metric, scalar, and structural models of invariance. **Results.** The results supported with empirical evidence that the ECO VI scale is characterized by measurement invariance. More precisely, 6 of its 8 dimensions are unbiasedly interpreted and can be considered for making meaningful comparisons across the considered national cultures, while the outputs deriving from the dimensions of "resources availability" and "interpersonal relationships" should be treated with more caution. Indeed, for such dimensions support for only configural and metric invariance was found. **Conclusions.** The main contribution of the present study was to provide evidence about the measurement invariance of the ECO VI scale. Thus, providing the community of scientists and practitioners operating in different Latin American countries with a molar organizational climate scale that can be used for conducting cross-cultural research. Hence, it is now possible to have a deeper understanding of how theories and practices involving the organizational climate for well-being can be better applied across the countries and cultures composing this continent.

Resumen.

Introducción. La investigación transcultural es fundamental tanto para el desarrollo y validación de teorías laborales y organizacionales en distintos contextos como para guiar prácticas basadas en la evidencia a nivel internacional. A pesar del hecho de que el clima organizacional es uno de los constructos más investigados en psicología organizacional, hay una falta de investigación que analice la invariancia de las medidas a través de distintas culturas nacionales en América Latina. Esto impide que los científicos y profesionales tengan una comprensión más profunda de esta variable en los diferentes países que componen este continente. **Objetivos.** Este estudio tiene como objetivo examinar la invariancia de medida de la escala "Encuesta de Clima Organizacional" en su sexta versión (ECO VI) en Colombia, Costa Rica, Panamá y República Dominicana. **Método.** Se recopiló datos de 38 empresas de manufactura con sede en los cuatro países mencionados: 1007 empleados en Colombia, 1090 en Costa Rica, 372 en Panamá y 213 en República Dominicana. La invariancia de la medición fue examinada por probar los modelos de invariancia configuracional, métrica, escalar y estructural. **Resultados.** Los resultados respaldaron con evidencia empírica que la escala ECO VI se caracteriza por la invariancia de medida a través de las cuatro muestras. Más precisamente, 6 de sus 8 dimensiones pueden considerarse para hacer comparaciones significativas entre las culturas nacionales consideradas, mientras que los resultados derivados de las dimensiones de "disponibilidad de recursos" y "relaciones interpersonales" deben tratarse con más cautela. De hecho, para tales dimensiones solo se encontró soporte para la invariancia configuracional y métrica. **Conclusiones.** La principal contribución del presente estudio fue aportar evidencia sobre la invariancia de medida de la escala ECO VI. Por lo tanto, brinda a la comunidad de científicos y profesionales que operan en diferentes países de América Latina una escala de clima organizacional molar que puede usarse con confiabilidad en los cuatro contextos analizados. Por lo tanto, ahora es posible tener una comprensión más profunda de cómo las teorías y prácticas que involucran el clima organizacional para el bienestar pueden aplicarse mejor en los países y culturas que componen este continente.

Keywords.

Organizational Climate for Well-Being; Measurement Invariance; Latin America; Cross-Cultural Research.

Palabras Clave.

Clima organizacional para el bienestar, invariancia de la medición, América Latina, transcultural.

1. Introduction

The molar organizational climate, which is explicitly defined and explained by [Schneider and colleagues \(2011\)](#) as an organizational climate for well-being, is an extensively researched variable that has been proven to play a relevant role as mediator between organizational characteristics and different individual and organizational workplace outcomes. For just mentioning some of the most recent literature reviews, [Gustafson and colleagues \(2018\)](#), by focusing on the sales literature, report that organizational climate for well-being has been found to have a direct significant relationship with job performance, intrinsic motivation, customer satisfaction, productivity, ethical behaviour, engagement, creativity, and corporate corruption. [Zhou et al. \(2020\)](#) highlight in their literature review how positive organizational climate for well-being favour the willingness to transmit and receive knowledge. Similarly, [Choudhury and Das \(2021\)](#) point out the relevant role that organizational climate for well-being plays in terms of knowledge management, since it supports the process of sharing tacit knowledge. More precisely, it helps sharing that very type of knowledge that is usually embedded in people's minds and that is difficult to disclose, but that is crucial for setting up a strong organisational knowledge base and improve the level of corporate performance ([Huie et al., 2020](#)). In addition and as it is possible to assume from the label, namely organizational climate *for well-being*, this climate plays a relevant role in the promotion of well-being at work. [Parker and colleagues \(2003\)](#) have found organizational climate for well-being to positively influence commitment, job involvement, job satisfaction, motivation, performance, and psychological well-being. Similarly, [Carr et al. \(2003\)](#), in their meta-analytic path analysis, showed the relevant role that organizational climate for well-being plays on psychological well-being, job satisfaction, job performance, organizational commitment, and withdrawal. In addition, [Loh and colleagues \(2019\)](#), [Ahmad et al. \(2018\)](#), [Viitala and colleagues \(2015\)](#), and [Bronkhorst et al. \(2015\)](#) provided, with their studies, evidence of the link between molar organizational climate and depression, stress, burnout, cynicism, anxiety, and work engagement.

Workplaces are increasingly characterized by international or multi-national structures ([UK Essays, 2018](#)). Indeed, internationalization of businesses across the world is a common trend that is leading companies to expand their businesses and consequently dislocate their plants or facilities in multiple countries and internationalize its workforce. This trend is occurring also in Colombia, where the central government supports enterprises to internationalize their businesses ([Nova Caldas, 2016](#)). Such governmental support has been producing its effects, indeed Colombian companies are expanding to other countries, especially to other Latin American ones.

All this, together with the strong migration processes that are characterizing the entire world, is making HR scientists and practitioners deal with an increasing diverse workforce, which requires them to be equipped with tools that have been checked for their cultural sensitivity also within the Latin American continent for making meaningful comparisons and drawing unbiased conclusions. Indeed, despite researchers and practitioners tend to simplistically consider Latin America as one homogeneous cultural bloc, a number of consistent and empirically supported arguments have been produced in the literature providing evidence about the need to regard this continent with more cultural complexity ([Aponte, 2009](#); [Lenartowicz & Johnson, 2003](#); [Margaona, 2012](#); [Varela et al., 2009](#)). [Lenartowicz and Johnson \(2003\)](#) make it clear through their empirical study that, if on one hand Latin America can be regarded as characterized by shared commonalities, such as collectivist rather than individualistic values, on the other hand such shared similarities should not lead scientists and practitioners to simplistically consider it as one homogeneous continent. Indeed, it is clear and strongly empirically supported that Latin American countries have strong cultural differences among one another. This both when they are considered singularly and when they are considered as belonging to meaningful cultural groupings ([Lenartowicz & Johnson, 2003](#)): 1. The Southern Cone (i.e., Argentina, Chile, Paraguay, Uruguay); 2. The Andean nations (i.e., Bolivia, Ecuador, Peru); 3. Northern South America (i.e., Colombia and Venezuela); 4. Brazil; 5. Mexico; 6. And Puerto Rico. As it is also shown by [Caycho-Rodríguez and colleagues \(2021\)](#), such cultural differences have an impact on how linguistic expressions are differently understood among such countries. In this sense, from a methodological perspective it becomes clear that ignoring these peculiarities that characterize each Latin American country can have detrimental effects both from a theoretical ([Chen, 2008](#)) and practical perspective ([Tann, 2005](#)). Checking for measurement invariance of the used tools, namely the statistical property of a scale that ensures the comparability of results among groups ([Chen, 2008](#)), becomes then a relevant evidence-based practice for ensuring an unbiased interpretation of the used items ([Davidov et al. 2014](#)).

In this regard, several tools have been developed in Latin America to measure molar organizational climate (see Table 1). Nevertheless, scientists and practitioners are restrained from rigorously using them transversally across the continent since, basing on what is reported in the relevant studies, the relevant checks for measurement invariance are missing and meaningful comparisons cannot be made among Latin American countries ([Davidov et al., 2014](#)). To fill this relevant gap, the purpose of the present study is to urgently check for the measurement invariance of the *Encuesta de Clima Organizacional* scale (ECO VI) in Colombia, Costa Rica, Panama, and Do-

minican Republic to provide scientists and practitioners operating with a tool that can be unbiasedly understood across the considered nations, hence for conducting cross-national research on the variable in question.

1.1 The Relevance of Conducting Cross-Cultural Research on the Organizational Climate for Well-Being

The organizational climate for well-being is a construct that aims at capturing the extent to which employees have a positive experience of their workplaces (Bowen & Ostroff, 2004). More precisely, it has been recently defined by Martinolli and colleagues (n.d.) as:

The shared perceptions and the meaning attached to the policies, practices, and procedures for promoting well-being that people belonging to the same organisation experience and that are reflected in the extent to which such policies, practices, and procedures are being rewarded, facilitated, supported, and expected. (p. 3)

Research on this variable has been conducted for a long time. Indeed, one of the first studies investigating “social climate” within groups was published by Lewin and colleagues in 1939. Since then, much research has been conducted on this variable in many different countries and continents and, coherently with Schneider’s and colleagues’ (2011) redefinition of the concept, it has been increasingly considered as a relevant construct to take into account when employees’ well-being is investigated (Ahmad et al., 2018; Bronkhorst et al., 2015; Carr et al., 2003; Loh et al., 2019; Parker et al., 2003; Viitala et al., 2015).

Consistently with the relevance that the organizational climate plays in the promotion of well-being among employees, this variable has been investigated also across multiple countries and cultures. Cross-cultural research represents a relevant practice that can have highly positive theoretical and practical consequences, especially in the present historical moment in which companies and organizations use to have multiple plants distributed across the world. Indeed, as Aycan and colleagues (2000) point it out, it is not a novelty that the cultural-societal context plays a relevant role in influencing how workplaces are managed and how employees perceive them (i.e., organizational climates). Consequently, supporting HR managers with a cross-cultural understanding of workplace phenomena can help them to consistently contribute to the overall firm performance (Burton et al., 2004). As stated by Gelfand et al. (2007), the main point made by this branch of research is to discard the ethnocentric assumption that concepts and theories are necessarily universals (i.e., *ethic*) but can be influenced by the cultural context in which they are considered (i.e., *emic*). More precisely, it claims that the way a concept or theory works and is understood in one culture is not necessarily the same also for all the other cul-

tures, since it is conditioned by the linguistic differences and cultural peculiarities of a specific population. As a consequence, Aycan and Gelfand (2012) highlight how investigating a same concept across more cultures represents a golden opportunity for having a more thorough theoretical understanding of a specific construct and for implementing relevant culturally sensitive HR practices. A very up-to-date example is reported in the study by Caycho-Rodríguez and colleagues (2021), in which it is shown how the concept of “fear of COVID-19” is not understood in the exact same way in the considered Latin American countries (i.e., Colombia, Ecuador, El Salvador, Mexico, Paraguay, Argentina, and Uruguay). Another clear example is provided by the study by Koles and Kondath (2015), in which it is highlighted how the cultural peculiarities of the considered countries (i.e., India, Hungary, and Portugal) play a relevant role in shaping the role that the molar organizational climate plays in the considered organizations. Similarly, Muhonen and colleagues (2013) point out how the relationship between leadership behaviour and employees well-being is prevalent in cultures that are more strongly characterized by collectivism and power distance.

Grounding on the positive impacts that cross-cultural research can have for both scientific and practical outcomes, it becomes relevant that both scientist and practitioners are adequately equipped to make sure that the instruments they use are free from linguistic biases. In regard, Davidov and colleagues (2014) make it clear that for conducting meaningful cross-cultural research or effectively operating as a practitioner in multinational organizations, it is necessary to have access to measurement tools that have been checked for their measurement invariance across national cultures (Chen, 2008; Davidov et al., 2014). Indeed, only scales with such statistical property can be used for making meaningful comparisons about a given construct among different cultures and for drawing accurate conclusions (Chen, 2008; Davidov et al., 2014). Unfortunately, the invariance of measurement tools across cultures is often assumed (Chen, 2008) and scales are often translated and used for conducting research or performing HR practices without bearing in mind the different interpretation of a same item or concept across cultures (Davidov et al., 2014). This way of proceeding can lead to detrimental consequences such as producing relevant theoretical inconsistencies (Chen, 2008), limiting the effectiveness of interventions (Tann, 2005), or undermining the interpretation of the obtained results (Chen, 2008). On the contrary, when adequately checked measurement tools are used, apart from avoiding the abovementioned hazards, it can produce relevant financial savings (Aponte, 2009). As a general conclusion, it can be stated that it is extremely important to bear in mind the differences that characterize different nations and the consequent need of using adequately checked measurement tools and scales for ensuring an unbiased interpretation of their items.

1.2 The Multicultural Composition of the Latin American Continent and the Need for Culturally Invariant Molar Organizational Climate Scales

Assuming measurement invariance, thus that the items of a scale are interpreted in a same way across cultures and nations, prevents outcomes to be free from measurement artifacts (Chen, 2008). To avoid such biases, scientists and practitioners are recommended to put in place relevant countermeasures, such as the adoption of assessment tools that have been checked for their measurement invariance (Davidov et al., 2014). Notwithstanding, in Latin America this has not been always the case. Indeed, as testified by multiple studies (Goodmann et al., 2021; Ruiz et al., 2021; Wang et al., 2021), this continent has being regarded as a homogeneous cultural and linguistic bloc and Latinos as people carrying comparable or identical cultural values (Varela et al., 2009). The relevant literature identifies two main factors that may have lead scientists and practitioners to operate in such a culturally myopic way (Varela et al., 2009). Firstly, the language represents a first and impactful one. Indeed, Spanish is recognized as the official national language in almost the totality of the countries composing Latin America, which renders this continent at a first and superficial sight homogeneous (Gálvez-Nieto et al., 2017; Varela et al., 2009). Indeed, it is well-known the historical kaleidoscopic presence of a wide variety native languages that have forged and contextualized the official national one in each region of Latin America (Bastin, 2017). Secondly, also the outcomes of relevant scientific works, such as the GLOBE project by Hofstede (1980, 2001) and the study by Davis (1969), have reinforced this view of pinpointing Latin America as one homogeneous bloc. Indeed, both projects made it clear that according to the findings, Latin America should be considered as characterized by one homogeneous culture (House et al., 2004). In addition, some researchers report that also the similar colonization process may be regarded as an aspect that has contributed to this homogeneous perception of the Latin American continent (Lenartowicz & Johnson, 2003).

As Tann proposes, “the Latino population, however, is far from homogenous” (2005, p. 137). Latin America represents a vast region with huge geographical, historical, linguistic, and indigenous differences that make this region culturally multi-composite (Margaona, 2012; Varela et al., 2009). As shown in the study by Varela and colleagues (2009), which takes as reference Schwartz’s (1994) rather than Hofstede’s (1980, 2001) framework, the cultural complexity of the Latin American continent is theoretically and empirically supported. Indeed, through the adoption of a different theoretical framework that specifically considers seven cultural values (i.e., conservatism, intellectual autonomy, affective autonomy, hierarchy, egalitarianism, mastery, and harmony), significant cultural disparities emerge among the coun-

tries of Argentina, Colombia, Mexico, and Venezuela (Varela et al., 2009). Furthermore, more evidence supporting the presence of cultural differences within this continent is provided by several other studies. Firstly, Aponte (2009), Caqueo-Urizar and colleagues (2021), Esnaola et al. (2017), and Gálvez-Nieto and colleagues (2017) strengthen the thesis proposed by Varela et al. (2009) by providing empirical support for cultural differences among other Latin American populations, such as Bolivia, Chile, and Peru. Secondly, Rojas-Rivas and colleagues (2021) point out how a same concept (i.e., gastronomy) can be differently understood and prioritized across different Latin American countries and cultures. A fact that underlines once again how in this continent there are significant differences also from a linguistic perspective. Finally, Burgess and colleagues (2017) point out, in the conclusive part of their article, to replicate their findings by using a more culturally complex perspective on Latinos, since considering them as a homogeneous population has produced mixed results.

Basing on what previously exposed, it can be stated that Latin America should be approached and investigated as a subregional rather than an atomized area, since each country of this continent is characterized by its own peculiarities (Varela et al., 2009). A direct consequence of considering Latin America with its due cultural complexity is reflected in the study of workplaces and the organizational phenomena that characterize them (Gelfand et al., 2008). Indeed, as pointed out by Gelfand and colleagues (2008) and Aycan and colleagues (2000), the broader societal context in which a company is based influences directly the industrial, the organizational, the work-unit, and individual context. In turn, cultural differences cannot be disregarded when workplace phenomena across different countries are investigated and both cultural and non-cultural context variables need to be considered for studying organizational behaviours and phenomena at large (Gelfand et al., 2008). For the sake of completeness, it is worth mentioning that to further study such complex contexts and make relevant cross-national comparisons, the use of assessment tools that are, from a linguistic point of view, invariant is relevantly needed.

The organizational climate for well-being is, by definition, a non-cultural context variable which has been defined and operationalized multiple times in different Latin American countries (see Table 1). Despite such abundance of scales, it is worth pointing out that, at least in this continent, the studies researching molar organizational climate have had a national rather than a cross-cultural focus. As a matter of fact, the great majority of the developed scales was validated and used to conduct research within the national boundaries of each Latin American country, resulting in a current scarce presence of measurement tools that allow an invariant measurement of this construct across multiple countries

and cultures. Indeed, basing on the identified validation studies, none of the reported scales in Table 1 have been checked for their measurement invariance across national cultures. A fact that makes it difficult to carry out rigorous studies that aim at understanding the role that plays the molar organizational climate in the workplaces based in different Latin American countries and cultures. Moreover, the reported scales were identified by searching the datasets of ISI Web Of Knowledge, Scopus, and Google Scholar, so to make sure to include both indexed and not indexed articles and a composition of multiple keywords, both in English and Spanish, was used, such as “Invariance”, “Organizational Climate”, “Validation”, “Molar Climate”, “Latin America”. Hence, for providing Latin American scientists and practitioners with a culturally invariant molar organizational climate scale, this study checks the measurement invariance of the ECO VI scale. This scale was recently refined and further validated by Martinolli and colleagues (n.d.) showing sound psychometric properties and adequacy for multilevel measurement.

2. Method

A cross-sectional research design was used for running the analyses. The ECO VI scale was answered in Spanish by employees working at 38 companies operating in the manufactory sector and based in four different Latin American countries, namely Colombia, Costa Rica, Dominican Republic, and Panama. In terms of selection criteria and sample exclusion, it was decided, as a best practice, to focus only on one specific industrial sector in order to reduce possible additional sources of invariance, apart from the linguistic/cultural one. In addition, considering that the initial sample, counting 20658 employees, was mainly composed by Colombian workers, it was rebalanced by randomly selecting 6% of the Colombian workforce.

2.1 Participants

The sample was composed of 2695 mainly local employees, on average 73 per company, of which 37.37% are based in Colombia, 40.45% in Costa Rica, 13.8% in Panama, and 7.9% in Dominican Republic. In terms of age, 8% declared to have an age ranging from 18 to 25 years, 11% between 26 and 35, 11% between 36 and 45, and 70% were older than 46. As for gender, 31.7% reported to be female, and 68.3% male. In terms of covered job position, 14.3% declared to be “Administrative”, 59.2% “Operative”, 17.4% “Commercial”, 7.4% “Maintenance”, .3% “Professional”, and 1.4% “Senior management”.

2.2 Procedure

Data were collected by CINCEL S.A.S., a research center and consulting company focused on organizational behaviours and based in Medellín (Colombia), from organizations based in Colombia, Costa Rica, Dominican

Republic, and Panama and in a period corresponding to the past 5 years (i.e., 2016–2020). Data were collected by the means of a paper and pencil survey after having received the informed consent from each participant. Respondents could resort to professionals in case of doubts about the items. The responses were digitalized by means of an electronic scanner. The companies involved in the study agreed with the use of the data for research purposes.

2.3 Measures

2.3.1 Organizational climate for well-being - The ECO VI scale
Organizational climate for well-being (Schneider et al., 2011) was measured by means of the ECO VI scale (Martinolli et al., n.d.). The scale has grounds on the Vitamin Model by Warr (1987, 2007), which is particularly suitable in that it theoretically identifies the relevant workplace features that affect employees’ well-being. It is composed of eight dimensions with three items each, specifically: 1. Leader support (e.g., “Here the leader responds to the job suggestions one presents”); 2. Teamwork (e.g., “Teamwork is the preferred way of doing things in this company”); 3. Organizational Clarity (e.g., “In this company everyone is well informed about the procedures of their work”); 4. Organizational support (e.g., “In this company one is helped in carrying out ones work initiatives”); 5. Stability (e.g., “The good employee can stay in this company as long as s/he wishes”); 6. Resource availability (e.g., “Here you have what you need to do your job”); 7. Interpersonal relationships (e.g., “In my work there is respect in the relationships among employees”); 8. Remuneration (e.g., “The salaries of this company are among the best in the city”). Items can be replied with a 4-point Likert response scale ranging from 1 = “Completely disagree” to 4 = “Completely agree”. Respondents could answer 0 corresponding to “I’m not sure about the statement”. As to the reliability of the scale, Cronbach’s α was found to be .94 in Colombia and Costa Rica, .89 in Panama, and .92 in the Dominican Republic.

2.4 Analyses

2.4.1 Treatment of missing data

Missing data were not imputed, since it amounted to less than the limit of 5% for which data imputation is required (Fichman & Cummings, 2003).

2.4.2 Measurement invariance across national cultures

The statistical software Mplus (Muthén & Muthén, 2017) was used for data analysis. The Robust Maximum Likelihood (RML) estimation method was used since data distribution did not always respect a completely normal distribution. First, the factor structure was tested on the four considered cultural groups (i.e., Colombia, Costa Rica, Dominican Republic, and Panama) to ensure that it can be used for subsequent invariance tests. With regard to the goodness of fit indices used for gaug-

Table 1
Review of Organizational Climate Scales in Latin-America

Name of the Scale	Reference	Number of Items	Number of Dimensions	Sample Size	Country
Escala de Clima del Ambiente Laboral Subjetivo (ECALS)	Barría-González et al. (2021)	38	5	1442	Chile
Cuestionario de Clima Organizacional Validado	Bustamante-Ubilla et al. (2016); Bustamante & Alvarez (2019)	44, 27	10, 4	561, 583	Chile, Ecuador
CFK Ltd.	Castillo et al. (2011)	26	5	17786	Colombia
	Chiang Vega et al. (2008)	40	8	547	Chile
	Dominguez et al. (2010)		4	385	Mexico
	Fernandez (2004)		4	1272, 1715	Mexico, Uruguay
El Clima Organizacional en el Diseño del Balanced Scorecard	Freire et al. (2011)	21	6	68	Mexico
Escala Multidimensional de Clima Organizacional (EMCO)	Gómez & Vicario (2008); Patlán Pérez & Flores Herrera (2013)	29	8	673	Mexico
IPAO	Gómez Rada (2004)	40	6	250	Colombia
	Hernández Sampieri et al. (2014)	95	17	1424	Mexico
Test de Clima Organizacional (TECLA)	Hoyos et al. (1974)		8		Colombia
Instrumento para Medir Clima en Organizaciones Colombianas (IMCOC)	Mendez Alvarez (2006)				Colombia
Cuestionario Sobre Clima Organizacional Universitario	Menezes et al. (2009)	67	7	668	Brazil
	Mujica de González & Pérez de Maldonado (2008)	64	8	271	Venezuela
Clima Grupos de Control de Vectores	Nortega Bravo & Pría Barros (2011)	60	5	89	Cuba
OLARIS	Paule & Caboverde (2011)	78	5		Cuba
Modelo de medición del Clima Organizacional	Reinoso Alarcón & Araneda Cea (2007)	48	7	153	Chile
Inventario Clima Organizacional	Rodriguez et al. (2010)	80	4		Cuba
Evaluación del Clima Organizacional en Salud por Segredo	Segredo Pérez (2017); Segredo Pérez et al. (2015)		50	10	Cuba
Encuesta de Clima Organizacional	Silvestre (2017)	55	14	302	Dominican Rep.
	Toro Alvarez (2008)	64	12	46064, 1613, 154, 1872, 978, 470, 169, 1218	Colombia, Venezuela, Ecuador, Mexico, Costa Rica, Perú, USA, Panama
Cuestionario De Clima Organizacional	Zegarra Valdivia & Arias Gallegos (2016)	47	5	93	Perú

ing the CFAs, the model fit was assessed using several empirically supported indices so to achieve a comprehensive evaluation of fit of the tested model: The comparative fit index (CFI), the Tucker-Lewis index (TLI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR). For the CFI and TLI, values above 0.90 are traditionally considered reasonable model fit, whereas stringent recommendations suggest values close to 0.95 (Hu & Bentler, 1999). For the RMSEA and the SRMR, values below .08 are traditionally considered reasonable model fit whereas stringent recommendations suggest values close to .06 (Hu & Bentler, 1999).

Subsequently, four different models were tested for assessing variance (Davidov et al., 2014). Firstly, the configural invariance (baseline) model was tested, which requires that the mere factor structures are equal across groups (Davidov et al., 2014) and allows to check if the construct bias is not present (Vijver, 1998). Hence, that the latent concept can be meaningfully discussed across the considered groups. Secondly, the metric invariance (Steenkamp & Baumgartner, 1998) or model weak measurement equivalence (Meredith, 1993) model was tested. This model requires that factor loadings between the items and the latent variable are equal across the considered groups and allows the comparison of difference scores across the groups (Davidov et al., 2014). Thirdly, scalar invariance (Steenkamp & Baumgartner, 1998) or strong measurement invariance (Meredith, 1993) model was tested. This model requires that factor loadings and the indicator intercepts between the items and the latent variable are equal across the considered groups and allows to validly compare raw scores of the latent factors and, in turn, to meaningfully compare latent means across groups (Meredith, 1993). Fourthly, the structural invariance or strict factorial (Meredith, 1993) model was tested. This model requires that item uniqueness, item intercepts, and factor loadings to all be invariant across the groups and allows to compare the observed factor means and the factor variances across the considered groups. With regard to the goodness of fit indices used for gauging the invariance, the root-mean-square error of approximation (RMSEA), the Tucker-Lewis index (TLI), and the comparative fit index (CFI) were considered. For both the TLI and CFI, values greater than .90 and .95 indicate, respectively, acceptable and excellent fit to the data. For the RMSEA, values less than .05 and .08 indicate, respectively, a close fit and a reasonable fit to the data (Marsh et al., 2004). However, there is considerable evidence that, in practical terms, large factor structures (e.g., at least five factors and multiple groups) are not able to fulfil even the minimally acceptable fit standards (Marsh et al., 2005). Hence, considering the complexity of the models that are used in the present study (i.e., eight factors and 24 items) and the large size of the used sam-

ples (i.e., Colombia = 1007 employees, Costa Rica = 1090 employees, Panama = 372 employees, and Dominican Republic = 213), it may be adequate to use less stringent cut-off points. Notwithstanding, the change in CFI and RMSEA are appropriate criteria for evaluating the relative fit of the taxonomy of nested measurement equivalence models, since large sample sizes will almost always signal a statistically significant chi-square difference. Support for the more parsimonious model requires a change in CFI and TLI of less than .01 (Chen, 2007; Cheung & Rensvold, 2002) or a change in RMSEA of less than .015 (Chen, 2007). Hence, the changes in CFI, TLI, and RMSEA were the primary indicators used for assessing measurement invariance for the ECO VI scale across the four cultural groups. Finally, when invariance among cultural groups was lacking, Modification Indexes (M.I.) and additional analyses were carried out. Concretely, for assessing the practical significance of the differential item functioning (DIF) detected, the standardized mean difference (Cohen's d) was computed and compared across groups (Chan, 2000). When the difference between d s is $< .20$, it can be regarded as insignificant, when $.20 \leq d$ difference $< .50$, it can be regarded as small, when $.50 \leq d$ difference $< .80$, it can be regarded as moderate, and finally when the difference between d s is $\geq .80$, then it can be regarded as big (Chan, 2000).

3. Results

The higher-order factor structure of the ECO VI scale was estimated separately for Colombia, Costa Rica, Panama, and Dominican Republic and results showed that the model had good fit (see Table 2) and similar standardized factor loadings for each cultural group (see Table 3). In the first step of invariance assessment, the configural model (i.e., Model 1) was used to understand if the latent concept measured by ECO VI can be meaningfully discussed across the considered cultural groups. All items were specified on their relevant factors and all the factor loadings of each item and thresholds were freely estimated in each group. The residual variances were held at 1 in all groups for identification. The configural model was found to have good fit (see Table 4), indicating the absence of construct bias between the considered samples. In the second step of invariance assessment, the metric invariance (i.e., Model 2) was used to understand if the comparison of difference scores across the considered groups is possible. The first threshold of each item was held equal across groups for identification. The relevant model was found to have good fit and the deltas between the useful indexes of Models 1 and 2 respected the thresholds (see Table 4), supporting and justifying comparisons of difference scores across the considered groups. In the third step of invariance assessment, the scalar invariance (i.e., Model 3) was used to understand if raw scores of the latent factors can be validly compared. The only difference com-

Table 2

Results CFA for Cultural Group

Group	χ^2	d.f.	RMSEA	CFI	TLI	SRMR
Colombia	448.112	224	.032	.976	.971	.036
Costa Rica	538.624	224	.036	.970	.963	.045
Dominican Rep.	385.463	224	.058	.890	.864	.059
Panama	309.128	224	.032	.969	.962	.041

Table 3

Factor Loadings for Cultural Group

Items	Factor Loadings Colombia	Factor Loadings Costa Rica	Factor Loadings Dominican Rep.	Factor Loadings Panama
e24	.778	.775	.745	.647
e46	.833	.817	.630	.804
e56	.865	.839	.754	.777
e13	.712	.705	.696	.569
e25	.721	.730	.565	.722
e63	.816	.801	.693	.753
e41	.834	.864	.863	.791
e50	.854	.896	.880	.840
e29	.791	.857	.716	.744
e27	.743	.738	.697	.663
e33	.933	.940	.964	.893
e39	.899	.925	.873	.790
e18	.826	.739	.452	.691
e28	.782	.763	.662	.578
e54	.727	.580	.370	.633
e23	.684	.726	.421	.675
e30	.797	.881	.681	.810
e38	.819	.849	.722	.822
e32	.805	.832	.750	.829
e51	.886	.919	.846	.839
e59	.842	.863	.773	.672
a4	.765	.777	.679	.722
a11	.807	.828	.738	.762
a16	.603	.553	.389	.546

Table 4

Multigroup Cultural Invariance Results

Model Description	χ^2	d.f.	RMSEA	CFI	TLI	Δ RMSEA	Δ CFI	Δ TLI
M1–Configural Invariance	1701.636	896	.037	.968	.960			
M2–Metric Invariance	1791.292	944	.037	.966	.961	.000	.002	.001
M3–Scalar Invariance	2368.419	1016	.045	.946	.941	.008	.020	.020
M4–Strict Invariance	3018.032	1088	.051	.923	.922	.006	.023	.019

Note. Δ TLI & Δ CFI < .01 (Cheung & Rensvold, 2002; Widaman, 1985); Δ RMSEA < .015 (Chen, 2007)

pared with previous step was that all item thresholds were constrained equal between the groups. The relevant model was found to have good fit, but the deltas between the CFIs and TLIs of Models 2 and 3 exceeded the thresholds (see Table 4), making uncertain the possibility to meaningfully compare latent means across the cultural groups. In the fourth and last step of invari-

ance assessment, the structural invariance (i.e., Model 4) was used to understand if the observed factor means and the factor variances across the considered groups can be compared. The only difference compared with previous step was that residual invariance terms were also constrained. The relevant model was found to have good fit but the deltas between the CFIs and TLIs of

Models 3 and 4 exceeded the thresholds (see Table 4), making also in this case uncertain the possibility to compare the observed factor means and the factor variances across the considered groups.

Because the deltas between the CFIs and TLIs of Models 2 and 3 and of Models 3 and 4 exceeded the suggested thresholds, Modification Indexes and additional analyses were carried out. At first, Models 3 and 4 were re-run based on the insights provided from the Modification Indexes and from a panel of 25 Spanish speaking experts that carried out a content analysis of the dimensions in question. Such panel of experts provided additional support for specifically excluding factor 6, since the wording of the items contained the word “implementos”, which is a typical Colombian expression for expressing the concept of resources and that is not commonly used in the other Latin American countries. On the other hand, for the exclusion of the dimension 7, a preliminary justification was found in the literature. Indeed, as suggested by Varela and colleagues (2009), the value of “harmony” (Schwartz, 1994), which is related to the concept of “interpersonal relationships” (i.e., dimension 7), represents a cultural value that is differently interpreted and perceived across Latin American countries. Hence, basing on such diverse understanding of this concept across Latin American cultural groups. Such exclusions have led to improved deltas (see Table 5), especially when it is kept into account that the scientific literature points out that large factor structures are not able to fulfil even the minimally acceptable fit standards (Marsh et al., 2005). Nevertheless, for a more thorough understanding of such variance, the standardized mean difference (Cohen’s *d*) was computed and compared across groups (Chan, 2000). Between Colombia and Costa Rica Cohen’s *d* difference amounted to be .11, between Colombia and the Dominica Republic .05, between Colombia and Panama .08, between Costa Rica and the Dominican Republic .05, between Costa Rica and Panama .04, and between Dominican Republic and Panama .01. In light of such results, it can be clearly stated that the detected variance can be regarded as insignificant, since they are all < .20. Hence, it can be affirmed that the ECO VI scale can be regarded as invariant across the considered countries when factors 6 and 7 are not included.

4. Discussion

The aim of the present study was to check the measurement invariance of the ECO VI molar organizational climate scale in four different Latin American countries (i.e., Colombia, Costa Rica, Panama, Dominican Republic). Indeed, despite the cultural complexity that characterizes the Latin American continent (Lenartowicz & Johnson, 2003; Varela et al., 2009), no organizational climate scales have been checked for their mea-

surement invariance across cultural groups, thus for having the relevant psychometric properties to be comparably used in different countries. According to the results of the performed analyses, it is possible to state that the ECO VI is characterized by measurement invariance. More precisely, six of its eight dimensions (i.e., organizational support, leader support, organizational clarity, stability, remuneration, teamwork) can be solidly used to equivalently measure the organizational climate for well-being in the here considered countries. On the contrary, the dimensions number 6 (i.e., resources availability) and 7 (i.e., interpersonal relationships) should be used more cautiously since, as abovementioned, they have been found to be differently interpreted by the workers belonging to the here considered cultural groups. For dimension 6, it is suggested that the usage of a more commonly used wording would be beneficial. On the other hand, for dimension 7 a more in-depth study of how interpersonal relationships are differently understood across Latin American countries would be of huge relevance to the scientific community.

Measurement invariance was tested by testing the four models pointed out by Meredith (1993). More precisely, the configural invariance model (baseline model), the weak measurement equivalence model, the strong measurement invariance model, and finally the structural or strict factorial invariance model were tested. As a result of this analysis and in light of the cultural variance that characterizes the dimensions 6 and 7 of the ECO VI scale, it is once again empirically supported that disregarding the instrument invariance when conducting cross-cultural research is strongly discouraged. Latin America is a huge continent composed of many different and culturally diverse countries that if on one hand are characterized by some overarching and superficial similarities, on the other hand they are characterized by peculiarities that can impact the understanding and interpretation of items and concepts (Lenartowicz & Johnson, 2003; Rojas-Rivas et al., 2021; Varela et al., 2009). In this sense, scientists and practitioner should resist from assuming that assessment tools worded in Spanish can be used by default for conducting research and making comparisons across Latin American countries. On the contrary, relevant statistical checks need to be performed and adequate assessment tools should be used (Davidov et al., 2014).

In terms of practical implications, considering the support that, for example, the Colombian government is providing to its national enterprises to grow internationally, this study provides HR practitioners and researchers with a culturally equivalent measurement tool that can be used in different Latin American cultures and countries for measuring the organizational climate for well-being, a variable that has strong relationship and impact on many different individual and organizational outcomes (Choudhury & Das, 2021; Gustafson et

Table 5

Multigroup Cultural Invariance Results – No Factors 6 and 7

Model Description	χ^2	d.f.	RMSEA	CFI	TLI	Δ RMSEA	Δ CFI	Δ TLI
M1–Configural Invariance	1875.814	896	.036	.969	.962			
M2–Metric Invariance	1972.929	944	.036	.968	.962	.000	.001	.000
M3–Scalar Invariance	2223.688	998	.043	.951	.946	.007	.018	.017
M4–Strict Invariance	2819.373	1070	.049	.930	.928	.006	.021	.018

Note. Δ TLI & Δ CFI < .01 (Cheung & Rensvold, 2002; Widaman, 1985); Δ RMSEA < .015 (Chen, 2007)

al., 2018; Zhou et al., 2020). Moreover, HR practitioners and scientists are empowered with a cross-culturally validated measurement tool that ensures un-biased results and potential negative secondary effects (Tann, 2005).

5. Practical and Theoretical Inputs to Take Away

Finally, the main take home messages that the present study would like to facilitate are those that follow. Firstly, Latin America is not a homogeneous cultural and linguistic bloc. Secondly, when conducting cross-cultural research, it is of fundamental importance to check the measurement invariance of the used tools. Finally, designing assessment tools that can be used to study psychosocial concepts across Latin American countries and cultures is fundamental to broaden their practical and theoretical implications, but the existence of culturally invariant tools should not lead to the naïf conclusion that Latin America represents one homogeneous cultural bloc.

6. Limitations and Future Research

It is worth pointing out that a great effort was made for considering data in four Latin American countries and that positive results were obtained. Nevertheless, the present study has some limitations that are worth pointing out. Latin America is composed of 20 countries, and 19 of them have Spanish as their official language. Consequently, increasing the number of countries in which the ECO VI scale is checked for measurement invariance would be highly beneficial for promoting cross-cultural research about the organizational climate for well-being also in the other countries and cultures composing Latin America. Along with this, it would also be necessary to translate the ECO VI scale into the other languages that are spoken in Latin America, such as Portuguese. All this would allow to have more a thorough understanding of the here considered construct, since psychological constructs can be rarely considered as universals, thus being equal across all the cultures the humankind belongs to (Aycan & Gelfand, 2012). Another limitation that is worth pointing out is the fact that the present study considers national groups as a proxy for cultural groups. This, despite being a commonly used practice

in studies that are similar to the present one, may not represent an optimal assumption. Indeed, as it can be intuitively understood there may not always be an exact fit between people’s culture and their nationalities. Finally, the authors also want to highlight that in this study the analyses for checking whether the analysed scale (i.e., ECO VI) had a positive relationship with a well-being outcome variable across the four considered cultural groups weren’t run. Despite such practice is usually not included in the canonical process for measurement invariance, the authors highlight that such additional analyses may represent a relevant insight.

To conclude, the ECO VI scale represents a molar organizational climate scale that can be invariantly used across the considered Latin American cultures/countries for making sound comparisons. The scale can then be used for advancing the research on psychological and organizational climates in these countries and promoting well-being in all their enterprises, especially those operating in the manufacturing sector. In this way, this study contributes to the achievement of the 3rd Sustainable Development Goal of the UN 2030 Agenda (United Nations, 2018), namely, the “Good Health and Well-Being” goal.

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