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Research Article

Examining Psychometric Properties and Measurement Invariance of the Emotion Regulation Questionnaire in an Ecuadorian Sample

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Abstract

The most popular instrument used to measure emotional regulation is the Emotion Regulation Questionnaire (ERQ), allowing researchers to study intergroup differences in emotional regulation across many different cultures. However, to make multi-group comparisons, factors within the measurement instrument must be invariant across groups. This invariance is necessary to ensure that any significant differences found between groups are due to group affiliation and not due to measurement errors in the instrument's factors. The study examined measurement invariance of the ERQ by gender using an Ecuadorian sample, where very few studies have previously investigated this issue. The sample included 815 college students. A confirmatory factor analysis indicated that the bi-factor model presented the best fit. The ERQ was invariant by gender at the strict level according to multi-group confirmatory factor analysis. The ERQ also presented good reliability scores for both men and women with no significant differences between genders. These results confirm that the ERQ is a reliable instrument and that it can detect differences in the use of emotional regulation strategies between men and women without risking errors caused by measurement variance.

Keywords: emotional regulation; ERQ; measurement equivalence; measurement invariance; Latin America.

Table of Contents

Method
Results
Discussion
Conclusion
References

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People's response to emotions can have significant consequences on their physical and mental well-being (Eisenberg, 2000). While not all aspects of the emotional experience can be controlled, certain strategies can be used to effectively regulate emotions (Gross, 2007). Emotional regulation is characterised as the ability to manage emotional reactions through the process of interaction with the environment, minimising any subsequent negative impact (Cole et al., 1994). Emotional regulation strategies can operate consciously or automatically (Gross, 2007), and are adaptive across different contexts. To this end, emotional regulation strategies can have profound implications for mental health and emotional well-being (Gresham & Gullone, 2012; Gross, 2015).

Although there are different types of strategies for regulating emotions, from which extensive classifications are derived (Pérez & Bello, 2017), the model by Gross and John (2003) has stood as one of the most influential. In this model, the two main strategies are reassessing the event early in the development of the emotional experience (cognitive reappraisal) and modulating the expression of emotion once it has already been elicited (emotional suppression; Gross, 1999). Based on this model, the Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) was developed. The ERQ consists of 10 items that form an oblique (i.e., correlated) two-factor structural model.

The questionnaire has been widely used in research from various countries and has been translated from its original version in English into other languages, such as Spanish (Rodríguez-Carvajal et al., 2006). Likewise, due to its good psychometric properties (internal structure and reliability), the original model of two orthogonal factors has been confirmed in different countries (Abler & Kessler, 2009; Balzarotti et al., 2010; Cabello et al., 2013; Preece et al., 2021). Also, an oblique two-factor model has been found in several counties (Enebrink et al., 2013; Gargurevich & Matos, 2010; Moreta-Herrera et al., 2018; Preece et al., 2020). More recently, a model including a general factor and two specific factors (i.e., bifactor model) has been found using an Ecuadorian sample (Moreta-Herrera et al., 2022).

Adaptations of the ERQ into other languages have allowed for research on emotional regulation to be conducted in many different countries. However, while evidence supports the internal structure of the ERQ, studies interested in conducting multi-group comparisons (e.g., by gender, age, marital status, ethnicity, nationality) are limited, as measurement invariance has, in most cases, not been previously confirmed as a structural property of the ERQ bi-factor. Thus, there is a risk of measurement bias when using the ERQ (Moreta-Herrera et al., 2021; Moreta-Herrera & Velástegui-Parra, 2020; Van De Schootet al., 2015), which may result in a Type I error when significant differences between groups are found.

Measure Invariance and Emotional Regulation

In studies comparing groups, it is expected that any identified difference is due to the characteristics of the groups (Piovani & Krawczyk, 2017). However, it is possible that these differences do not result from group characteristics but instead from the instrument assessing slightly different factors on different groups (Asparouhov & Muthén, 2014). This can occur, for example, when participants from different groups interpret items from a questionnaire differently, leading to measurement bias (Van De Schoot et al., 2015). Thus, this psychometric property is crucial to ensure fair group comparisons, since it confirms that the internal structure of the test is similar for each group.

Despite its importance, this property is frequently neglected in studies (Phan et al., 2020). It is often just assumed that the instrument is invariant across groups, even though this property is hardly met (Van De Schoot et al., 2015). For this reason, if the measurement invariance of an instrument is not verified subsequent analyses do not allow for an appropriate contrast of the hypotheses (Caycho-Rodríguez et al., 2021; Stark et al., 2006).

For example, in the case of the ERQ, there are several studies comparing differences between genders in adolescents and young adult samples (Gardener et al., 2013; Rogier et al., 2019; Yeh et al., 2017). However, any conclusions made regarding differences between genders could be inaccurate, since the instrument has not been verified as invariant across groups of gender. Thus, it is not possible to ensure that the differences found are due to the particular characteristic of the group (true difference) or due to the structural differences of the measure (measurement bias).

Measurement invariance analyses are scarce for most psychological instruments, especially when considering their adaptations on Latin American samples. Some studies have reviewed ERQ measurement equivalence between genders, but these have been primarily conducted in the United States and Europe (Gómez-Ortiz et al., 2016; Gullone & Taffe, 2012; Melka et al., 2011; Preece et al., 2021; Teixeira et al., 2015) and Asia (Ling et al., 2019). All these are based on the original orthogonal model of Gross and John (2003). These studies also provide evidence that the ERQ is invariant by gender in these populations. However, measurement invariance by gender of the ERQ still needs to be confirmed on samples from other cultural backgrounds, particularly in countries where it is currently being used for studying group differences on the use of emotion regulation strategies.

Objectives and hypotheses

The aims of the study are (a) to examine measurement invariance in the ERQ between genders in an Ecuadorian sample and (b) to analyse the reliability of the ERQ between genders. For Hypothesis 1 (H_1), we predicted that the factorial structure of the ERQ would adequately adjust to the oblique two-factor model of Gross and John (2003) and that it is invariant between genders. For Hypothesis 2 (H_2), we predicted that the reliability, both in its point estimate and in its confidence intervals (95%), would be adequate in both gender groups.

Method

Design

The present study analysed the factorial structure, the measurement invariance by gender, and the internal consistency of the ERQ.

Participants

The study consisted of 815 participants (480 women), aged between 14 and 39 years (*M* = 19.3 years; *SD* = 3.4), of which 93.6% self-identified as mestizo, 4.8% as indigenous and 1.5% were divided into Black or White. 61.3% resided in urban areas and 38.7% in rural areas from the cities of Ambato, Pelileo, Salcedo and Latacunga in Ecuador. The participants were adolescents (40.2%) between 14 to 17 years old (M= 16.17; SD= 1.07) from two high schools, and young adults (59.8%) were between 18 and 39 years old (M= 21.33; SD= 2.89) from two universities.

Instruments

The Spanish version (Rodríguez-Carvajal et al., 2006) of the Emotional Regulation Questionnaire (ERQ; Gross & John, 2003) was used. The ERQ was designed to assess emotional regulation capacity through two dimensions: cognitive reappraisal and emotional suppression. Responses were rated on a 7-point rating scale, ranging from 1 (strongly disagree) to 7 (strongly agree). This instrument has shown good psychometric properties in both structural and reliability analyses (Moreta-Herrera, et al. 2018), with an internal consistency of α = 0.77 (four items) for emotional suppression and α = 0.82 (six items) for cognitive reassessment.

Procedure

The study was advertised to different groups of students at various Ecuadorian high schools and universities. Students interested in participating were instructed to contact one of the researchers and schedule a group assessment. Underaged participants were asked to present a consent form signed by their parents or legal guardian. The evaluation was paper-based and was conducted within each educational institution in classrooms previously prepared for the assessment by a member of the research team. The duration of the evaluation was approximately 30 minutes.

Incomplete questionnaires were not considered. The project was approved by the ethics committee of the Pontifical Catholic University of Ecuador Campus Ambato (an Ecuadorian University), who was in charge of monitoring and following up on compliance with the ethical aspects of the study.

Data Analysis

The statistical analyses were conducted in four steps. The first step consisted of preliminary descriptive analyses where the arithmetic mean (*M*) and the standard deviation (*SD*) were calculated for each of the items of the CERQ. Also, the distribution of responses was analysed by looking at its skewness (g1) and kurtosis (g2) to confirm the assumption of univariate normality. Skewness and kurtosis values that are distributed in the range ± 1.5 comply with the assumption of normality (Ferrando & Anguiano-Carrasco, 2010). The Mardia (1970) test was also conducted to verify compliance with multivariate normality, as this was an essential step for the subsequent confirmatory factor analysis (CFA) in assigning the estimation method. An absence of significance in the kurtosis and skewness values (p > .05) would indicate that this assumption is met.

The second step consisted of a Con”Irm’tory Factor Analysis for the ERQ. The factorial structure was tested as a model of two correlated factors (oblique) (Gross & John, 2003), two uncorrelated factors (orthogonal) and a bifactor model, all of them using the Robust Maximum Likelihood (MLR) estimation method. This estimation was used given the nature of the items and the absence of a multivariate normal distribution (Jin & Cao, 2018; Li, 2016). The model is considered to be a good fit when Chi-Square (χ^2) is not significant (p > .05) or the normed Chi-square (χ^2 / degrees of freedom) is ≤ 4. Also, relative indices such as the Comparative Fit Index (CFI) and the Tucker-Lewis Index (TLI) should be ≥ 0.9; and finally, the non-centrality-based index such as the Root Mean Square Error of Approximation (RMSEA) should be ≤ 0.08 (Brown, 2015; Byrne, 1998; Byrne & van de Vijver, 2010; Dominguez-Lara et al., 2022; Jonason et al., 2020; Hair et al., 2004; Wolf et al., 2013). For the bi-factor model, the Omega Hierarchical estimation (ω_H) was used for the general factor and it needs to be ≥ .70 and the Explained Common Variance (ECV) ≥ .60 (Reise et al., 2013; Rodriguez et al., 2016). The magnitude of the factorial loads of the adjustment models was also analysed. For this, saturations are expected to be greater than 0.5 to allow for greater consolidation of the model (Dominguez-Lara, 2018).

The third step was to analyse the measurement equivalence of the ERQ between genders on the models that presented a good fit in the second step of analyses. Subsequently, the degree of invariance between groups was analysed with a Multi-group Confirmatory Factor Analysis (MG-CFA) with the MLR estimation method in four stages: configural invariance (equivalence of the factorial structure of the ERQ between groups), metric invariance (equivalence of the factor loadings), scalar invariance (equivalence of thresholds) and strict invariance (equivalence of residuals). The measurement invariance is met when the chi-square ($\Delta\chi^2$) is not significant on the different nested models that are presented progressively (e.g., configural invariance and metric invariance; Asparouhov & Muthén, 2014; Brown, 2015), and the variation from one model to another and is greater than -.01 in the case of the CFI (ΔCFI) and less than or equal to .01 in the case of the RMSEA (ΔRMSEA; Chen, 2007). In the case that chi-squared ($\Delta\chi^2$) is significant, the ΔCFI needs to be greater than -.002 and the ΔRMSEA less than or equal to .007 (Meade et al., 2008).

Finally, the fourth step of analysis consisted of testing the reliability of the construct and ERQ scores. Initially, the reliability of the construct was estimated with the omega coefficient (ω, McDonald, 1999), which is ideal for items including categorical response options (Ventura-León & Caycho-Rodríguez, 2017). It was also provided α scores to allow comparisons with other studies since this is a more common coefficient for internal consistency. Together with the coefficient ω, the 95% confidence intervals were reported in order to achieve a more precise estimate (Dominguez-

Lara et al., 2015). The confidence intervals of the differences between the reliability values of the groups were also calculated in order to determine the level of distortion between them, both in the ω coefficient and in the α coefficient (Bonnet, 2010; Dominguez-Lara et al., 2018).

All statistical analyses were performed using R version 3.6.1 (R Core Team, 2019) with the MVN, Lavaan, SemTools and mBess packages for the preliminary analyses, the CFA, the factorial invariance and the reliability estimation.

Results

Descriptive Analyses

Table 1 shows descriptive statistics for all the ERQ items. The mean scores between the ERQ items for both men and women were found to be homogeneous.

Skewness and kurtosis were also analysed to evaluate the assumption of univariate normality in the items. In both cases, the values did not exceed the range ± 1.5, which indicates that the ERQ items follow a normal univariate distribution. However, in the case of the multivariate distribution, the Mardia test values show that the assumption of multivariate normality was not fulfilled for either group.

Table 1.
Descriptive statistics from items of the ERQ grouped by gender.

Items	Men				Women			
	M	*SD*	g_1	g_2	*M*	*SD*	g_1	g_2
When I want to feel more positive emotion (such as joy or amusement), I change what ''m thinking about	5.19	1.60	-1.14	0.64	5.20	1.58	-1.01	0.43
I keep my emotions to myself	5.03	1.69	-0.77	-0.15	4.99	1.74	-0.66	-0.49
When I want to feel less negative emotion (such as sadness or anger), I change what ''m thinking about	5.06	1.63	-0.79	-0.09	5.12	1.74	-0.91	-0.08
When I am feeling positive emotions, I am careful not to express them	4.30	1.78	-0.30	-0.94	4.09	2.01	-0.14	-1.28
When ''m faced with a stressful situation, I make myself think about it in a way that helps me stay calm	5.15	1.54	-0.93	0.39	5.09	1.59	-0.82	0.10
I control my emotions by not expressing them	4.70	1.68	-0.55	-0.45	4.45	1.82	-0.38	-0.86
When I want to feel more positive emotion, I change the way ''m thinking about the situation	5.09	1.61	-0.97	0.29	5.15	1.64	-0.91	0.15

I control my emotions by changing the way I think about the situation ''m in	5.10	1.53	-0.89	0.34	5.18	1.47	-0.81	0.11
When I am feeling negative emotions, I make sure not to express them	4.88	1.75	-0.64	-0.52	4.70	1.86	-0.50	-0.80
When I want to feel less negative emotion, I change the way ''m thinking about the situation	5.11	1.54	-0.92	0.34	5.07	1.59	-0.82	0.10
Mardia			1018.6***	33.6			959.6***	24.4

*** p < .001; M = arithmetic mean; SD = standard deviation; g_1 = skewness; g_2 = kurtosis

Confirmatory Factor Analysis

The correlated two factors, uncorrelated two factors, and bifactor models were tested and their fit indices are presented in Table 2. Both the correlated two-factor model and the bifactor model yielded an adequate fit of their internal structure. However, the fit indices show that the bifactor model is better compared to the uncorrelated two-factor model with significant differences ($\Delta\chi^2(9)$ = 47.37; p < .001).

Table 2.

Confirmatory Factor Analyses of the ERQ using MLR estimation.

Estimations	χ^2	*Df*	χ^2/Df	*CFI*	*TLI*	*SRMR*	*RMSEA*
Correlated two factors	112.33***	34	3.3	.94	.92	.046	.057 [.047 - .066]
Uncorrelated two factors	196.50***	35	5.6	.87	.83	.015	.080 [.072 - .089]
Bifactor model+	61.86***	25	2.5	.97	.94	.031	.045 [.033 - .058]

*** p < .001 + ω_H= .73; ω_{Hs1}= .04; ω_{Hs2}= .52; PUC= .533; ECV= .63

Factor Analysis by Gender

Table 3 shows that the bifactor model fits adequately for both men and women. The absolute (χ^2/DF), relative (CFI and TLI), and non-centrality-based (RMSEA) fit indices show that the values obtained are within acceptable parameters, confirming that the model is optimal. Furthermore, in the ERQ measurement equivalence analysis, the MG-CFA shows that the indices are adequate, and as the nesting progresses (metric, scalar, and strict), the variability of the ΔCFI and ΔRMSEA values were not significantly altered. Therefore, these results suggest that the ERQ is strictly invariant for both gender groups.

Table 3.
Factorial invariance analysis of the ERQ by sex using MLR estimation.

Estimations	χ^2 (gl)	CFI	RMSEA	$\Delta\chi^2$ (*DF*)	ΔCFI	ΔRMSEA
Baseline men	28.09 (25)	.995	.019	-	-	-
Baseline women	98.83 (25)	.917	.063	-	-	-
Configural invariance	142.13 (50)	.944	.062	-	-	-
Metric invariance	178.04 (67)	.944	.053	21.29 (17)	.001	.009
Scalar invariance	181.73 (74)	.945	.051	3.94 (7)	.000	.003
Strict invariance	186.53 (77)	.945	.050	4.89 (3)	.002	.000

* $p < .05$

The detailed analysis of the saturation of the items in the bifactor model, as seen in Figure 1, showed that the items are homogeneous with each other. In all cases, factor loadings were acceptable. However, item saturation seems to be higher on the general factor than on the specific factors.

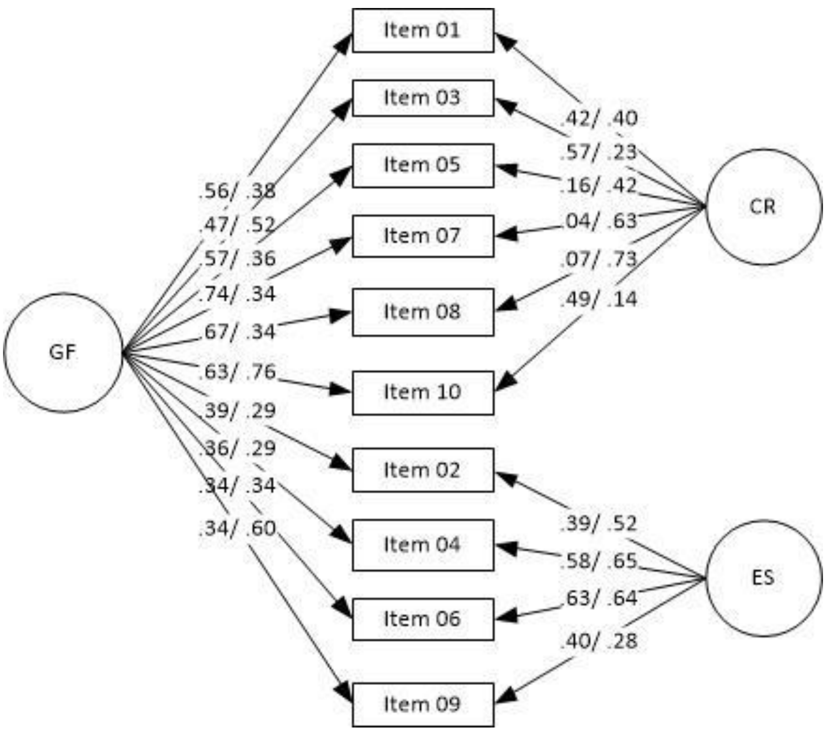

Figure 1. *Bifactor model from the ERQ.*

CR: Cognitive reappraisal; *ES:* Emotional suppression; *GF:* General factor. Factor loadings for both men and women (men / women) are presented on the left and right side of each item depending on the factor.

Reliability analysis

Internal consistency of the ERQ was estimated for the total score and each subscale. As observed in Table 3, ω and α coefficients, along with their respective confidence intervals, were within an acceptable range. This was true for both men and women.

Regarding reliability differences between the gender groups, confidence intervals of the differences in analysed coefficients were not statistically significant since the range includes 0. This supports that the ERQ similarly estimates error for both men and women.

Table 4.
Reliability of the ERQ for men and women.

Factors	Items	Men	Women	Difference
Construct reliability (ω – CI 95%)				
Cognitive reappraisal	6	.83 [.79 - .87]	.78 [.73 - .82]	.05 [-.01 - .11]
Emotional suppression	4	.71 [.65 - .77]	.74 [.68 - .79]	-.03 [-.11 - .05]
ERQ	10	.81 [.77 - .86]	.80 [.75 - .84]	.01 [-.05 - .09]
Reliability from scores (α – CI 95%)				
Cognitive reappraisal	6	.83 [.80 - .85]	.80 [.78 - .83]	.03 [-.01 - .06]
Emotional suppression	4	.71 [.66 - .76]	.74 [.70 - .79]	-.03 [-.10 - .03]
ERQ	10	.82 [.79 - .85]	.80 [.77 - .83]	.02 [-.02 - .06]

ω: McDonald's coefficient; α: Alpha's coefficient; CI 95%: Confidence interval at 95%

Discussion

This study aimed to analyse the factorial structure of the ERQ, the measurement invariance between genders and its reliability in a sample of adolescents and adults from Ecuador.

Regarding the factorial structure of the ERQ, the uncorrelated two-factor model and the bi-factor model (involving cognitive reappraisal and emotional suppression as specific factors and a general factor), presented a good fit according to the critical values from the fit indices (Brown, 2015; Byrne & van de Vijver, 2010; Dominguez-Lara et al., 2022; Hair et al., 2004; Wolf et al., 2013). These findings are not in line with the orthogonal (i.e., uncorrelated) model presented originally by Gross and John (2003) and with similar validation studies (Abler & Kessler, 2009; Balzarotti et al., 2010; Cabello et al., 2013; Preece et al., 2021). On the contrary, they are in line with alternative validation studies indicating that the ERQ presents two correlated factors (Gargurevich & Matos, 2010;

Enebrink et al., 2013; Preece et al., 2020) and a bi-factor structure (Moreta-Herrera et al., 2022). The bifactor model is significantly better than the uncorrelated two-factor model presenting better fit indices. These results serve as an updated confirmation of the factorial structure of the ERQ in an Ecuadorian sample. It should be noted that the type of variable from the ERQ's items is continuous and that there was an absence of multivariate distribution, thus alternative estimators such as the robust maximum likelihood estimator (MLR) should be used.

In relation to the measurement invariance between genders of the ERQ, results from the MG-CFA of the bi-factor model show that it is invariant at a Strict level and does not suffer significant differences in the variability of the adjustment indicators (ΔCFI and ΔRMSEA; Asparouhov & Muthén, 2014; Chen, 2007; Meade et al., 2008). In the case of $\Delta\chi^2$ for strict invariance, a statistically significant result was observed ($p < .05$), which could be explained by the relatively large sample size, as it has been noted that χ^2 is sensitive to large samples (Byrne, 1998). This finding is not in line with those from similar studies, such as those from Melka et al. (2011), Gullone and Taffe (2012), Teixeira et al. (2015), Gómez-Ortiz et al. (2016), Preece et al. (2021) and Ling et al. (2019), where the ERQ was found to be invariant between male and female participants in correlated and uncorrelated two-factor models. The presence of measurement equivalence indicates that the new factorial configuration is similar for men and women, and thus, differences between genders found using the ERQ cannot be attributed to measurement invariance.

In relation to the reliability of the ERQ, the magnitudes found, both at the point and interval level, indicate that the items adequately represent the construct for both men and women. Also, the difference in coefficients' between groups was not significant, as indicated by confidence intervals' including the 0 value, evidencing that there was similar internal consistency of the ERQ for both genders (Bonnet, 2010; Dominguez-Lara et al., 2018). Overall, the reliability found in this study is in line with the reliability found in other studies. However, this is the first study to compare the reliability of the ERQ between genders with an Ecuadorian sample.

These results have implications for future evaluations of the psychometric properties of the ERQ in Latin American samples. Specifically, this study finds support for the psychometric strengths of the ERQ as evidenced from the analysis of its factorial structure, its reliability for both genders, and measurement invariance between men and women. The positive results from the measurement invariance analyses are of particular relevance, as measurement invariance has received very little attention in previous studies (Phan et al., 2020). In this way, this study provides valuable support to studies using the ERQ, given the limited number of previous studies which have analysed these psychometric properties in Latin American populations. Furthermore, additional support is provided for the psychometric properties of the ERQ as alternative estimates such as the MLR in the MG-CFA were included in the analysis, as was the coefficient ω for reliability due to the categorical nature of item responses and to the absence of a multivariate distribution. These latter methodological decisions are a particular strength not present in other similar studies, which typically fail to accurately corroborate factor invariance. More importantly, this is probably the first study in Latin America to perform this assessment on the ERQ. However, more studies need to corroborate these findings using samples from other populations in the region. For now, these results support the development of future studies exploring differences between gender on the use of emotional regulation strategies as measured by the ERQ and ratify prior results from studies making these gender comparisons.

Limitations and Future Research

One limitation of the current study is that the sample exclusively comprised participants from one region of Ecuador. Future studies should consider recruiting samples with greater diversity, including other age groups such as adults and older adults, as well as different sociodemographic characteristics such as professionals, general population, clinical populations and others.

Conclusion

The ERQ in the Ecuadorian context is configured as an instrument with unidimensional characteristics to assess emotional regulation and is also gender invariant. Thus, the ERQ results in a reliable instrument that can detect differences in the use of emotional regulation strategies between men and women without running the risk of errors caused by the variance of the measurement.

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Competing Interests

The authors have declared that no competing interests exist.

References

Abler, B., & Kessler, H. (2009). Emotion Regulation Questionnaire – A German version of Gross & John's ERQ. *Diagnostica*, 55(3), 144-152. https://doi.org/10.1026/0012-1924.55.3.144

Asparouhov, T., & Muthén, B. (2014). Multiple-group factor analysis alignment. *Structural Equation Modeling: A Multidisciplinary Journal, 21*(4), 495-508.

Balzarotti, S., John, O. P., & Gross, J. J. (2010). An Italian adaptation of the Emotion Regulation Questionnaire. *European Journal of Psychological Assessment, 26*(1), 61-67. https://doi.org/10.1027/1015-5759/a000009

Bonnet, D. (2010). Varying coefficient meta-analytic methods for alpha reliability. *Psychological Methods, 15*(368), 85. https://doi.org/10.1037/a0020142

Brown, T. A. (2015). *Confirmatory factor analysis for applied research* (Vol. 2nd). Guilford Publications.

Byrne, B. M. (1998). *Structural equation modeling with LISREL, PRELIS, and SIMPLIS: Basic Concepts, applications and programming.* Lawrence Erlbaum Associates.

Byrne, B. M., & van de Vijver, F. (2010). Testing for measurement and structural equivalence in large-scale cross-cultural studies: Addressing the issue of none-quivalence. *International Journal of Testing, 10*(2), 107–132.

Cabello, R., Salguero, J. M., Fernández-Berrocal, P., & Gross, J. (2013). A Spanish adaptation of the emotion regulation questionnaire. *European Journal of Psychological Assessment, 29*(4), 234–240. https://doi.org/10.1027/1015-5759/a000150

Caycho-Rodríguez, T., Valencia, P., Vilca, L., Cervigni, M., Gallegos, M., Maritno, P., Barés, I., Calandra, M., Rey Anacona, C., López-Calle, C., Moreta-Herrera, R., Chacón-Andrade, E., Lobos-Rivera, M., del Carpio, P., Quintero, Y., Robles, E., Panza Lombardo, M., Gamarra Recalde, O., Buschiazzo Figares, A., White, M., & Burgos, C. (2021). Cross-cultural measurement invariance of the Fear of COVID-19 Scale in seven Latin American countries. *Death Studies*. Online first. https://doi.org/10.1080/07481187.2021.1879318

Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling, 14*, 464-504.

Cole, P., Michel, M. K., & Teti, L. (1994). The development of emotion regulation and dysregulation: a clinical perspective. *Monographs of the Society for Research, 59*, 73–102. https://doi.org/10.2307/1166139

Dominguez-Lara, S. (2018). Propuesta de puntos de corte para cargas factoriales: una perspectiva de fiabilidad de constructo [Proposal of cut-off points for factorial loadings: A construct reliability perspective]. *Enfermería Clínica, 28*(6), 401-402. https://doi.org/10.1016/j.enfcli.2018.06.002

Dominguez-Lara, S., Gravini-Donado, M., Moreta-Herrera, R., Quistgaard-Álvarez, A., Barboza-Zelada, L.A., De Taobada, L. (2022). Propiedades psicométricas del Student adaptation to College Questionnaire - Educación Remota en Estudiantes Universitarios de primer año durante la pandemia [Psychometric properties of the Student Adaptation to College Questionnaire- Remote Education in freshmen college studentes during pandemic]. *Campos Virtuales*. 11(1). https://doi.org/10.54988/cv.2022.1.965

Domínguez-Lara, S., & Merino-Soto, C. (2015). ¿Por qué es importante reportar los intervalos de confianza del coeficiente alfa de Cronbach? [Why is it important to report the confidence intervals of the Cronbach's alpha coefficient?]. *RLCSNJ, 13*(2), 1326-1328.

Dominguez-Lara, S., Merino-Soto, C., & Navarro-Loli, J. (2018). Comparación de coeficientes alfa basada en intervalos de confianza [Comparison of alpha coefficients based on confidence intervals]. *Educación Médica, 19*(1), 70. https://doi.org/10.1016/j.edumed.2017.03.025

Eisenberg, N. (2000). Emotion, regulation, and moral development. *Annual Review of Psychology, 51*, 665–697.

Enebrink, P., Björnsdotter, A., & Ghaderi, A. (2013). The Emotion Regulation Questionnaire: Psychometric Properties and Norms for Swedish Parents of Children Aged 10-13 Years. *Europe's Journal of Psychology, 9*(2), 289-303. https://doi.org/10.23668/psycharchives.1378

Ferrando, P. J., & Anguiano-Carrasco, C. (2010). El análisis factorial como técnica de investigación en psicología [Factor analysis as a research technique in psychology]. *Papeles del Psicólogo, 31*(1), 18-33.

Gardener, E. K., Carr, A. R., MacGregor, A., & Felmingham, K. L. (2013). Sex differences and emotion regulation: An event-related potential study. *PloS one, 8*(10), Article e73475. https://doi.org/10.1371/journal.pone.0073475

Gargurevich, R., & Matos, L. (2010). Propiedades psicométricas del Cuestionario de Regulación Emocional adaptado para el Perú (ERQP) [Psychometric properties of the Emotional Regulation Questionnaire adapted for Peru (ERQP)]. *Revista de Psicología, 12*, 192-215.

Gómez-Ortiz, O., Romera, E. M., Ortega-Ruiz, R., Cabello, R., & Fernández-Berrocal, P. (2016). Analysis of emotion regulation in Spanish adolescents: validation of the emotion regulation questionnaire. *Frontiers in psychology, 6*(1959). https://doi.org/10.3389/fpsyg.2015.01959

Gross, J. (1999). Emotion regulation: past, present, future. *Cognition and Emotion, 13*, 551-573.

Gross, J. J. (2007). *Handbook of Emotion Regulation.* Guilford.

Gross, J. J. (2015). Emotion regulation: Current status and future prospects. *Psychological Inquiry, 26*(1), 1-26. https://doi.org/10.1080/1047840X.2014.940781

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology*, *85*, 348-362.

Gullone, E., & Taffe, J. (2012). The emotion regulation questionnaire for children and adolescents (ERQ-CA): A psychometric evaluation. *Psychological Assessment, 24*(2), 409–417. https://doi.org/10.1037/a0025777

Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (2004). *Análisis multivariante [Multivariate analysis].* Madrid, España: Prentice Hall.

Jin, S., & Cao, C. (2018). Selecting polychoric instrumental variables in confirmatory factor analysis: An alternative specification test and effects of instrumental variables. *British Journal of Mathematical and Statistical Psychology, 71*(2), 387-413. https://doi.org10.1111/bmsp.12128

Jonason, P., Zemojtel-Piotrowska, M., Piotrowski, J., Sedikides, C., Campbell, K., Gebauer, J., Adamovic, M., Adams, B., Kadiyono, A., Atitsogbe, K., Bundhoo, H., Bălțătescu, S., Bilić, S., Gruneau Brulin, J., Chobthamkit, P., Dominguez, A., Dragova-Koleva, S., El-Astal, S., Esteves, C., . . . Yahiiaev, I. (2020). Country Level Correlates of the Dark Triad Traits in 49 Countries. *Journal of personality*, *88*(6), 1252-1267. https://doi.org/10.1111/jopy.12569

Li, C. H. (2016). Confirmatory factor analysis with ordinal data: Comparing robust maximum likelihood and diagonally weighted least squares. *Behavior research methods, 48*(3), 936-949. https://doi.org/10.3758/s13428-015-0619-7

Li, C. H., & Wu, J. J. (2020). Psychometric evaluation of the Chinese version of the Emotion Regulation Questionnaire in Taiwanese college students. *Assessment*, 27(6), 1300-1309. https://doi.org/10.1177%2F1073191118773875

Ling, Y., He, Y., Huebner, E. S., Zeng, Y., Li, Y., & Zhao, N. (2019). Gender-Based Measurement Invariance of the Emotion Regulation Questionnaire for Children and Adolescents. *Applied Research in Quality of Life*, 14(2), 409-421.

Mardia, K. (1970). Measures of Multivariate Skewness and Kurtosis with Applications Measures of Multivariate Skewness and Kurtosis with Applications. *Biometrika, 57*, 519. https://doi.org/10.2307/2334770

McDonald, R. P. (1999). *Test theory: A unified treatment.* Lawrence Erlbaum Associates.

Meade, A. W., Johnson, E. C., & Braddy, P. W. (2008). Power and sensitivity of alternative fit indices in tests of measurement invariance. *Journal of Applied Psychology, 93*, 568–592.

Melka, S. E., Lancaster, S. L., Bryant, A. R., & Rodriguez, B. F. (2011). Confirmatory factor and measurement invariance analyses of the emotion regulation questionnaire. *Journal of Clinical Psychology, 67*(12), 1283-1293. https://doi.org/10.1002/jclp.20836

Moreta-Herrera, R.; Domínguez-Lara, S.; Sánchez-Guevara, S.; López-Castro, J. & Molina-Narváez, M. (2021.). Análisis multigrupo por sexo y fiabilidad del Cuestionario de Regulación Emocional (ERQ) en jóvenes ecuatorianos. [Multigroup analysis by sex and reliability of the Emotional Regulation Questionnaire (ERQ) in young Ecuadorians] *Avaliação Psicológica*, *20*(2), 220-228. http://http//dx.doi.org/10.15689/ap.2021.2002.19889.10

Moreta-Herrera, R., Durán-Rodríguez, T., & Gaibor-González, I. (2018). Estructura factorial y fiabilidad del Cuestionario de Regulación Emocional (ERQ) en una muestra de estudiantes del Ecuador [Factor structure and reliability of the Emotional Regulation Questionnaire (ERQ) in a sample of students from Ecuador]. *PSIENCIA: Revista Latinoamericana de Ciencia Psicológica, 10*(2), 4. https://doi.org/10.5872/psiencia/10.2.24

Moreta-Herrera, R., Perdomo-Pérez, M., Vaca-Quintana, D., Sánchez-Vélez, H., Camacho-Bonilla, P., Vásquez de la Bandera, F., Domínguez-Lara, S. & Caycho-Rodríguez, T. (2022). New psychometric evidence of a bifactorial structure of the Emotional Regulation Questionnaire (ERQ) in Ecuadorian College Students. *Psychology in Russia: State of the Art*. 15(1), 120-134. https://doi.org/10.11621/pir.2022.0108

Moreta-Herrera, R., & Velástegui-Parra, A. (2020). El sesgo de equivalencia de medida en los análisis comparativos. El uso de la invarianza factorial para estudios en ciencias sociales y de la salud [Measure equivalence bias in comparative analyses. The use of factor invariance for studies in social and health sciences]. *Interacciones, 6*(1), Article e200. https://doi.org/10.24016/202

Pérez, O. G., & Bello, N. C. (2017). Regulación emocional: definición, red nomológica y medición [Emotional regulation: definition, nomological network and measurement]. *Revista mexicana de investigación en psicología, 8*(1), 96-117.

Phan, W., Ho, M., & Sam, E. (2020). Measurement Equivalence of the Entrepreneurship, Professionalism, and Leadership Career Aspiration Scale. En H. Ho, J. Kennedy, M. Uy, & K. Chan (Edits.), *Entrepreneurship–Professionalism–Leadership.* Springer.

Preece, D., Becerra, R., Robinson, K., & Gross, J. (2020). The Emotion Regulation Questionnaire: Psychometric Properties in General Community Samples. *Journal of Personality Assessment, 102*(3), 348-356. https://doi.org/10.1080/00223891.2018.1564319

Preece, D. A., Becerra, R., Hasking, P., McEvoy, P. M., Boyes, M., Sauer-Zavala, S., ... & Gross, J. J. (2021). The Emotion Regulation Questionnaire: Psychometric Properties and Relations with Affective Symptoms in a United States General Community Sample. *Journal of Affective Disorders*. 284, 27-30. https://doi.org/10.1016/j.jad.2021.01.071

Piovani, J. I., & Krawczyk, N. (2017). Los Estudios Comparativos: algunas notas históricas, epistemológicas y metodológicas [Comparative Studies: Some historical, epistemological and methodological notes]. *Educação & Realidade, 42*(3), 821-840.

R Core Team. (2019). *R: A language and environment for statistical computing.* R Foundation for Statistical Computing.

Reise, S., Scheines, R., Widaman, K., & Haviland, M. (2013). Multidimensionality and structural coefficient bias in structural equation modeling: A bifactor perspective. *Educational and Psychological Measurement*, 73(1), 5-26. https://doi.org10.1177/00223891.2015.1089249

Rodriguez, A., Reise, S., & Haviland, M. (2016). Evaluating bifactor models: calculating and interpreting statistical indices. *Psychological Methods*, 21(2), 137-150. https://doi.org/10.1037/met0000045

Rodríguez-Carvajal, R., Moreno-Jiménez, B., & Garrosa, E. (2006). *Cuestionario de Regulación Emocional. Versión española [Emotion Regulation Questionnaire. Spanish Version].* Universidad Autónoma de Madrid.

Rogier, G., Garofalo, C., & Velotti, P. (2019). Is Emotional Suppression Always Bad? A Matter of Flexibility and Gender Differences. *Curr Psychol, 38*, 411–420. https://doi.org/10.1007/s12144-017-9623-7

Stark, S., Chernyshenko, O., & Drasgow, F. (2006). Detecting DIF with CFA and IRT: Toward a unified strategy. *Journal of Applied Psychology, 91*, 1292-1306. https://doi.org/10.1016/j.hrmr.2008.03.003

Teixeira, A., Silva, E., Tavares, D., & Freire, T. (2015). Portuguese validation of the Emotion Regulation Questionnaire for Children and Adolescents (ERQ-CA): Relations with self-esteem and life satisfaction. *Child Indicators Research, 8*(3), 605-621. https://doi.org10.1007/s12187-014-9266-2

Van De Schoot, R., Schmidt, P., De Beuckelaer, A., Lek, K., & Zondervan-Zwijnenburg, M. (2015). Measurement invariance. Frontiers in psychology. Article *6*(1064), https://doi.org/10.3389/fpsyg.2015.01064

Ventura-León, J., & Caycho-Rodríguez, T. (2017). El coeficiente Omega: un método alternativo para la estimación de la confiabilidad [The Omega coefficient: An alternative method for estimating reliability]. *Revista Latinoamericana de Ciencias Sociales, Niñez y Juventud, 15*(1), 625-627.

Wolf, E. J., Harrington, K. M., Clark, S. L., & Miller, M. W. (2013). Sample size requirements for structural equation models: An evaluation of power, bias, and solution propriety. *Educational and psychological measurement, 73*(6), 913-934. https://doi.org/10.1177/0013164413495237

Yeh, K.-H., Bedford, O., Wu, C.-W., Wang, S.-Y., & Yen, N.-S. (2017). Suppression Benefits Boys in Taiwan: The Relation between Gender, Emotional Regulation Strategy, and Mental Health. *Frontiers in Psychology, 8*(135). https://doi.org/10.3389/fpsyg.2017.00135

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