Personality and Individual Differences 193 (2022) 111610

Contents lists available at ScienceDirect

Personality and Individual Differences

journal homepage: www.elsevier.com/locate/paid

Construction and evidence of validity regarding the emotion self-regulation questionnaire

Helena Garrido-Hernansaiz [a], Rocío Rodríguez-Rey [b,*], Carmen Nieto [c], Jesús Alonso-Tapia [d]

[a] Department of Education and Psychology, Centro Universitario Cardenal Cisneros, Alcalá de Henares, Spain
[b] Department of Psychology, School of Human and Social Sciences, Universidad Pontificia Comillas, Madrid, Spain
[c] Department of Basic Psychology, School of Psychology, Universidad Autónoma de Madrid, Spain
[d] Department of Biological and Health Psychology, School of Psychology, Universidad Autónoma de Madrid, Spain

ARTICLE INFO

Keywords:
Emotion
Regulation
Assessment
Psychometric properties

ABSTRACT

This study provides validity evidence for the scores interpretations of an 18-item emotion self-regulation questionnaire (ESQ) which measures both adaptive and maladaptive emotion regulation (ER) strategies (Positive Reappraisal, Controlled Expression, Arousal Regulation, Suppression, Rumination, and Unhealthy Behaviors). Participants (N = 622 adults) completed the ESQ and other measures of ER and ER beliefs, stress, and satisfaction with life. Structural Equations Modeling was used to compare four-factor models (one correlational, two hierarchical, and one bifactor) and to cross-validate the results across randomized and gender subsamples. The correlated model showed the best fit and demonstrated invariance between subsamples. Internal consistency (McDonald's ω) was acceptable for most strategies scores and their temporal stability (Intra-class Correlation Coefficients) on a 1-month follow-up was moderate. Correlation analyses also provided evidence of validity of the ESQ scores interpretations. This study provides an instrument whose scores and scores interpretations have received empirical support in terms of internal consistency, temporal stability, and evidence of validity.

Emotion regulation (ER) is the process by which individuals influence the emotional trajectory to respond appropriately to environmental demands or to feel better (Gross, 2015). It is a complex process that involves changes in experiential, behavioral, and/or physiological responses in order to influence the intensity, duration, and quality of the emotional experience (Gross, 2008, 2015). Gross' process model of ER posts that when an aspect of the world is perceived (attention), it is evaluated as positive or negative (appraisal), thus generating an emotion (response; Gross, 2015). Following this model, ER strategies can influence the emotion trajectory once it has been generated by targeting relevant steps of this process: attention, appraisal, and response (Gross, 2008, 2015).

The attention and appraisal steps can be the target of cognitive strategies. Attention can be effectively deployed to different aspects of a certain situation (e.g., rumination; De France & Hollenstein, 2017; Liu & Thompson, 2017) and each of those aspects can be appraised in different ways (e.g., reappraisal; Aldao & Nolen-Hoeksema, 2012; Liu & Thompson, 2017). The response step can be targeted by modulation strategies aimed at the experiential, behavioral, or physiological components of the emotion. For instance, people usually attempt to regulate their emotions by smoking or eating (Gross, 2015; Larsen & Prizmic, 2004), and by decreasing physiological arousal with physical exercise or body relaxation (De France & Hollenstein, 2017; Gross, 2008; Larsen & Prizmic, 2004). Other possibilities include emotional expression (De France & Hollenstein, 2017; Efferdinger et al., 2017) or expressive suppression (Gross, 2015; Kobylińska & Kusev, 2019).

The use of ER strategies is associated with better or worse mental health, depending on whether the strategies used are adaptive or maladaptive (Aldao & Nolen-Hoeksema, 2012; Aldao et al., 2010; Schäfer et al., 2017). Focusing on the latter, suppression and rumination (Aldao et al., 2010; Chervonsky & Hunt, 2017; Hallion et al., 2018; Liu & Thompson, 2017) have been linked to higher negative affect and depression and lower positive affect and satisfaction with life (SWL). Maladaptive behaviors (e.g., smoking, eating) are common responses that work in the short term but not in the long one (Gross, 2015; Larsen & Prizmic, 2004; Liu et al., 2017).

Regarding adaptive strategies, arousal regulation involves the voluntary efforts (e.g., deep breathing) to control autonomic arousal (De France & Hollenstein, 2017), decreasing physiological aspects of negative emotions (Gross, 2008). It has been related to increased positive

* Corresponding author at: Universidad Pontificia Comillas, C/Universidad Comillas, 3-5, 28049 Madrid, Spain.
E-mail address: rocio.r.rey@comillas.edu (R. Rodríguez-Rey).

https://doi.org/10.1016/j.paid.2022.111610
Received 18 January 2022; Received in revised form 7 March 2022; Accepted 10 March 2022
Available online 26 March 2022

affect (Larsen & Prizmic, 2004) and effective regulation of anxiety, anger, stress, depression, and tension (De France & Hollenstein, 2017; Larsen & Prizmic, 2004). Reappraisal has also been associated with better interpersonal functioning and psychological wellbeing, higher positive affect, and fewer psychopathology symptoms (Aldao et al., 2010; Aldao & Nolen-Hoeksema, 2012; Liu & Thompson, 2017). Finally, concerning emotional expression, a meta-analysis indicated mixed results (Chervonsky & Hunt, 2017). Consequently, some authors have highlighted the importance of control over emotional expression (Efferdinger et al., 2017), since it is the ability to choose what to express and to what extent, depending on the situation, that is adaptive.

As discussed, ER is key to psychological well-being, so it is necessary that psychometric tools are available to assess the wide range of ER strategies that people can use (De France & Hollenstein, 2017). However, ER assessment tools and studies have traditionally focused on just reappraisal and expressive suppression (Kobylińska & Kusev, 2019), with one of the most used instruments, the Emotion Regulation Questionnaire (Gross & John, 2003), being an example of this. This could be a relevant avenue in research and scale development.

Indeed, there are some tools that consider more than two strategies, like the Regulation of Emotion Systems Survey (RESS; De France & Hollenstein, 2017), which assesses six strategies that tackle the cognitive, behavioral, and physiological dimensions and the different steps of the emotion process (Gross, 2015). However, it only considers expression (i.e., suppression and engagement) at the response modulation stage, while unhealthy behaviors (e.g., drinking, smoking) are left out. The Cognitive Emotion Regulation Questionnaire (CERQ; Garnefski & Kraaij, 2007) and the Behavioral Emotion Regulation Questionnaire (BERQ; Kraaij & Garnefski, 2019) also measure several strategies — nine cognitive and five behavioral strategies, respectively. Together, they make a lengthy 56-item tool that leaves out physiological strategies and commonly used behavioral strategies (e.g., unhealthy behaviors). A comparison of the aforementioned instruments with the one that we developed in the present study is presented in Supplementary Table 1.

Consequently, this study aims to develop an ER instrument including several strategies tackling different aspects and steps of the emotion generation process. It will include cognitive, physiological, and behavioral strategies representing adaptive and maladaptive ER strategies used to regulate unpleasant emotions. The psychometric properties of its scores interpretations will be explored, testing their reliability and assessing their validity with measures of stress, SWL, ER and ER related constructs.

1. Methods

1.1. Participants

A sample of 622 participants from the general Spanish population was recruited. There were 470 women (75.6%), 150 men (24.1%), and two participants (0.3%) who reported another gender. The mean age was 40.06 years ($SD = 12.84$). Most were born in Spain (82.2%), 16.4% in a Latin American country, 1.5% in another country.

1.2. Instruments

1.2.1. Emotion Self-regulation Questionnaire (ESQ)

This is an 18-item questionnaire developed for this study with a 5-point response scale. It measures Positive Reappraisal, Arousal Regulation, Controlled Expression, Rumination, Suppression, and Unhealthy Behaviors (see Supplementary Table 2). Its development process is described later.

1.2.2. Emotion Regulation Questionnaire (ERQ; Gross & John, 2003)

This 10-item questionnaire with a 7-point Likert-type response scale measures two ways of ER: Cognitive Reappraisal and Expressive Suppression. The scores of the Spanish version (Cabello et al., 2013) showed adequate internal consistency (α = 0.75 Suppression and 0.79 Reappraisal) and test-retest reliability (0.66 and 0.64, respectively). In our sample, internal consistency was also adequate (α = 0.79 Suppression and 0.83 Reappraisal).

1.2.3. Trait Meta-Mood Scale (TMMS; Salovey, Mayer, Goldman, Turvey, & Palfai, 1995)

This scale measures "individual differences in the ability to reflect upon and manage one's emotions" (Salovey et al., 1995, p. 126) and includes three dimensions: Attention, Clarity, and Repair. We used the Spanish 24-item version (Fernández-Berrocal et al., 2004), whose scores showed adequate internal consistency (Attention α = 0.90; Clarity 0.90, and Repair 0.86) and test-retest reliability (0.60, 0.70, and 0.83, respectively). In our sample, internal consistency was also adequate (0.91, 0.93, and 0.89, respectively).

1.2.4. Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985)

It is a 5-item tool to be answered on a 7-point Likert scale. The English version scores showed a high internal consistency (α = 0.87), as also did the Spanish version (α = 0.88; Vázquez et al., 2013) and the scores from our sample (α = 0.92).

1.2.5. Perceived Stress Scale (PSS-10; Remor, 2006)

This is a 10-item scale in Spanish with a 5-point response scale. Its scores demonstrated adequate reliability (α = 0.82; test-retest, $r = 0.77$), evidence of validity, and sensitivity (Remor, 2006). The reliability was also good in our sample (α = 0.87).

1.3. Development of the scale

A literature review about the concept of ER was conducted in order to select a theoretical model and the strategies. Following criteria by De France and Hollenstein (2017), we considered that: 1) there had to be evidence to demonstrate a strategy's impact on an emotional experience; 2) strategies must have a clear impact on one emotion component (cognition, behavior, or physiological arousal; Gross, 2015); 3) strategies must not be redundant and must be mutually exclusive, and 4) only strategies available to conscious awareness should be selected for self-report measures. Finally, we considered that the selected strategies needed to cover the different steps of the emotion generation process (attention, appraisal, and response) and that behavioral strategies (e.g., eating, smoking) should be included (Gross, 2015; Larsen & Prizmic, 2004).

Following such criteria, we selected the strategies Positive Reappraisal, Arousal Regulation, Controlled Expression, Rumination, Suppression, and Unhealthy Behaviors. A 5-point Likert response format was agreed upon. Then, after an iterative process in which 5 experts discussed several items for each strategy, three items were selected for each. Subsequently, two different experts reviewed the items independently and proposed changes to make the items more accurate. Finally, an agreement on a final version was reached.

1.4. Procedure

The study was approved by the ethical committee at the last author's University. All procedures were in accordance with the 1964 Helsinki declaration. The sample was recruited online using a snowball approach. The authors shared invitations to the study through social media and also with university students, colleagues, and acquaintances, asking for collaboration and further dissemination of the study. Individuals willing to participate provided their consent and completed the instruments online. Participants received no incentives. Inclusion criteria were a minimum age of 18 and comfort speaking Spanish. All items were mandatory. To study the test-retest reliability of the ESQ scores, participants were asked permission to be re-contacted one month after

participating. A fifth (n = 126, 20.3%) completed this second assessment. Participants who completed the retest did not differ in any of the variables assessed from those who did not (see Suppl. Table 3).

1.5. Data analysis

To obtain validity evidence of internal structure, four models (correlational, hierarchical with one or two second-order factors, and bifactor; see Fig. 1) were specified and analyzed through Structural Equations Modeling (SEM) to determine which one explained the factorial structure of the ESQ scores best. In all models, the scale items loaded on the first-order factors (e.g., Suppression…). In the correlational model (Fig. 1a), the first-order factors were correlated. In the first hierarchical model (Fig. 1b), the first-order factors loaded on a second-order general factor (ER), and in the second (Fig. 1c), they loaded on one of two second-order general factors (Adaptive ER or Maladaptive ER). Finally, in the bifactor model (Fig. 1d), all the items also loaded on an additional first-order factor (ER), aside from the first-order factors.

The sample was randomly divided into two groups (n_1 = 311; n_2 = 311) and the four models were tested on the first subsample through confirmatory factor analyses (CFA). We used MLMV (maximum likelihood mean and variance adjusted) as the estimation method as some item indices suggested non-normality. Model fit was assessed through the indices Chi-square divided by degrees of freedom (χ^2/df), RMSEA (root mean square error of approximation), SRMR (standardized root mean squared residual), CFI (comparative fit index), and TLI (Tucker–Lewis index), following standard criteria ($\chi^2/df \leq 3$; SRMR $\leq$ 0.08; RMSEA $\leq$ 0.08; CFI, TLI $\geq$ 0.90 is acceptable and $\geq$0.95 is good; Hair, 2014). Results of the best model were subjected to multigroup analyses across random and gender samples to test invariance (i.e., to ascertain if it was estimated similarly in both) by imposing restrictions on factor loadings (metric invariance) and factor variances and covariances (structural invariance) as indicated for this type of study. Model fit was assessed with the same fit indices, with decreases no greater than 0.01 in CFI signifying invariance. Factorial scores were computed as weighted sum scores (DiStefano et al., 2009) for each strategy based on the standardized loadings in the best model. Descriptive statistics were obtained and *t*-tests were used to explore gender differences.

McDonald's ω coefficients were calculated to test internal consistency. To assess test-retest reliability, Intra-class Correlation Coefficient (ICC) estimates and their 95% confident intervals were obtained based

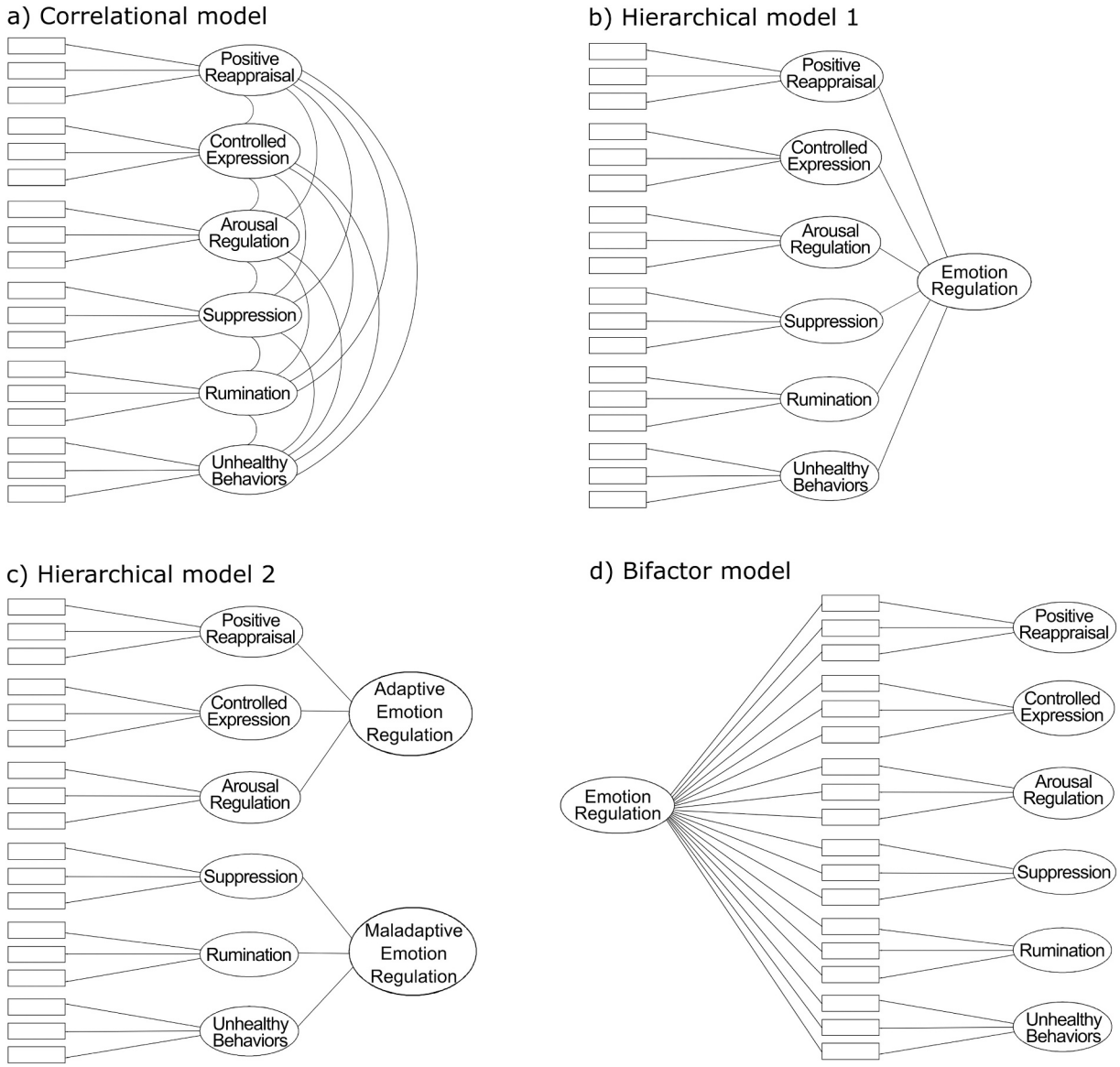

Fig. 1. Factorial models to be tested.

on a single-measures, absolute-agreement, two-way mixed-effects model, which are interpreted as follows: poor reliability, <0.50; moderate reliability, 0.50–0.75; and good reliability, >0.75 (Koo & Li, 2016).

Validity evidence of relations to other variables was assessed by Pearson's correlations. Table 3 shows the expected associations between the scores of the ESQ and the scores of the ERQ, the TMMS, the SWLS, and the PSS. Regarding the ERQ, we expected the Controlled Expression and Suppression scores to show the strongest correlations (a negative and a positive correlation, respectively) with the ERQ dimension of Expressive Suppression. Additionally, we expected a moderate association between Positive Reappraisal scores and the scores of the ERQ dimension of Cognitive Reappraisal. We did not expect a high correlation because while the ERQ understands reappraisal as changing one's thoughts about emotion-eliciting events (Gross & John, 2003), our questionnaire focuses on positive thinking and learning (i.e., "I see what I can learn from the experience"). Finally, we expected the remaining ESQ strategies to be related to the ERQ dimensions to a weak or moderate degree.

Concerning the TMMS, we expected that the dimensions of Clarity and Repair would be positively associated with the adaptive strategies in the ESQ and negatively with the maladaptive ones. As for the Attention dimension — the extent to which people observe and think about their feelings — we expected positive associations with strategies involving such attention (i.e., Rumination, Positive Reappraisal, Arousal Regulation, Controlled Expression, Unhealthy Behaviors) and a negative correlation with strategies involving no attention (i.e., Suppression). Lastly, focusing on the PSS and the SWLS scores, in line with the literature supporting that adaptive ER strategies are associated with better mental health outcomes, while non-adaptive strategies lead to poorer outcomes (e.g., Aldao et al., 2010; Aldao & Nolen-Hoeksema, 2012; Schäfer et al., 2017) we expected the scores of the ESQ adaptive strategies (Reappraisal, Controlled Expression, and Arousal Regulation) to be associated positively with the SWLS scores and inversely with the PSS scores. The contrary was expected for the maladaptive strategies (Suppression, Rumination, and Unhealthy Behaviors).

Finally, incremental evidence of validity was obtained by performing multiple linear regressions with stress and SWL as criteria and comparing the predictive power of the ERQ and the ESQ in each case. MPlus 7.2 was used for all SEM analyses and SPSS 25 was used for the rest.

2. Results

2.1. Factor structure

Table 1 shows the model fit indices of the four factorial models. The correlated model (depicted in Fig. 2) showed the best fit to data and only its fit indices were all above the model acceptance limits. Thus, it was retained.

2.1.1. Multi-group Invariance Testing

The correlated model was subjected to two multi-group analyses, first using the two randomized subsamples, and later comparing women and men. In both cases, the baseline model had good fit indices (see Table 1) and subsequent equality constraints were imposed on factor loadings, factor variances, and factor covariances, which resulted in CFI decreases no greater than 0.01, indicating configural, metric, and structural invariance.

2.1.2. Reliability analyses

McDonald's ω coefficients are shown in Table 2, indicating acceptable to good internal consistency for the ESQ scores except in the case of Arousal Regulation (ω = 0.64) and Unhealthy Behaviors (ω = 0.64). Table 2 shows the ICC values for the test-retest reliability, which ranged 0.61–0.72, indicating moderate temporal stability.

Table 1
Goodness of fit statistics of different models and multi-group cross-validation analyses of the best model for the ESQ.

Model	*df*	χ^2/df	CFI	TLI	RMSEA	SRMR
Correlated[1]	120	1.38	0.97	0.96	0.04	0.05
Hierarchical – one factor[1]	129	2.11	0.89	0.87	0.06	0.09
Hierarchical – two factors[1]	128	1.87	0.88	0.86	0.11	0.09
Bifactor[1]	117	2.12	0.90	0.87	0.06	0.08
MGA-random[2]						
Baseline model	240	1.49	0.96	0.94	0.04	0.05
Restricted factor loadings	252	1.46	0.96	0.95	0.04	0.05
Restricted factor variances	258	1.45	0.96	0.95	0.04	0.05
Restricted factor covariances	273	1.39	0.96	0.96	0.04	0.05
MGA-gender[3]						
Baseline model	240	1.42	0.96	0.95	0.04	0.04
Restricted factor loadings	252	1.40	0.96	0.95	0.04	0.05
Restricted factor variances	276	1.53	0.96	0.95	0.04	0.05
Restricted factor covariances	291	1.51	0.96	0.96	0.04	0.06

[1] $n_1 = 311$.
[2] Multigroup analysis with random subsamples, $n_1 = 311$, $n_2 = 311$.
[3] Multigroup analysis by gender: $n_1 = 470$ (women), $n_2 = 150$ (men). The two participants reporting other gender were excluded from this analysis.

2.1.3. Descriptive data of the ESQ scores

The means and standard deviations of the ESQ factor scores are included in Table 2. Women tended to express their emotions more, $t(618) = 1.40$, $p < 0.001$, to suppress them less, $t(618) = -3.87$, $p < 0.001$, and to use unhealthy behaviors more, $t(618) = 2.42.87$, $p = 0.03$. Fig. 2 shows the correlations between the ESQ factor scores, which tended to be significant and moderate. Controlled Expression showed no significant correlations with Rumination or Unhealthy Behaviors, and Suppression was not significantly associated with Arousal Regulation.

2.1.4. Evidences of validity

Correlations between the ESQ and the ERQ, PSS, SWLS and TMMS scores appear in Table 3. As expected, ERQ's Cognitive Reappraisal was significant, positive, and moderately correlated with ESQ's Positive Reappraisal and Arousal Regulation, and negative and weakly associated with Rumination and Unhealthy Behaviors. It showed no relation with Controlled Expression or Suppression. All the associations between the ESQ strategies scores and ERQ's Expressive Suppression were significant, being inverse and weak with Positive Reappraisal and Arousal Regulation, and strong with Controlled Expression, as well as direct and strong with Suppression and weak with Rumination and Unhealthy Behaviors.

All the correlations between the ESQ scores and stress were statistically significant, being positive for Suppression, Rumination, and Unhealthy Behaviors, and inverse for Positive Reappraisal, Controlled Expression, and Arousal Regulation. On the other hand, SWL showed statistically significant correlations with all the strategies, following the inverse pattern. The strongest correlations were between stress and Rumination and between SWL and Positive Reappraisal. Concerning the TMMS scores, the dimensions of Clarity and Repair showed positive and significant correlations with all the ESQ strategies. Clarity showed the highest correlations with Controlled Expression and Repair did with Positive Reappraisal. Finally, the Attention dimension showed a negative although weak correlation with Suppression, no association with Positive Reappraisal, and positive correlations with Controlled Expression, Arousal Regulation, Rumination, and Unhealthy Behaviors. These were the expected correlations, except for the lack of association between Attention and Positive Reappraisal.

Finally, concerning incremental evidence of validity, the ESQ scores predicted stress (adjusted $R^2 = 0.44$), $F(6, 615) = 82.07$, $p < 0.001$, better than the ERQ scores did (adjusted $R^2 = 0.14$), $F(2, 619) = 53.41$, $p < 0.001$. The ESQ (adjusted $R^2 = 0.25$), $F(2, 619) = 106.81$, $p < 0.001$, and the ERQ (adjusted $R^2 = 0.24$), $F(6, 615) = 33.65$, $p < 0.001$,

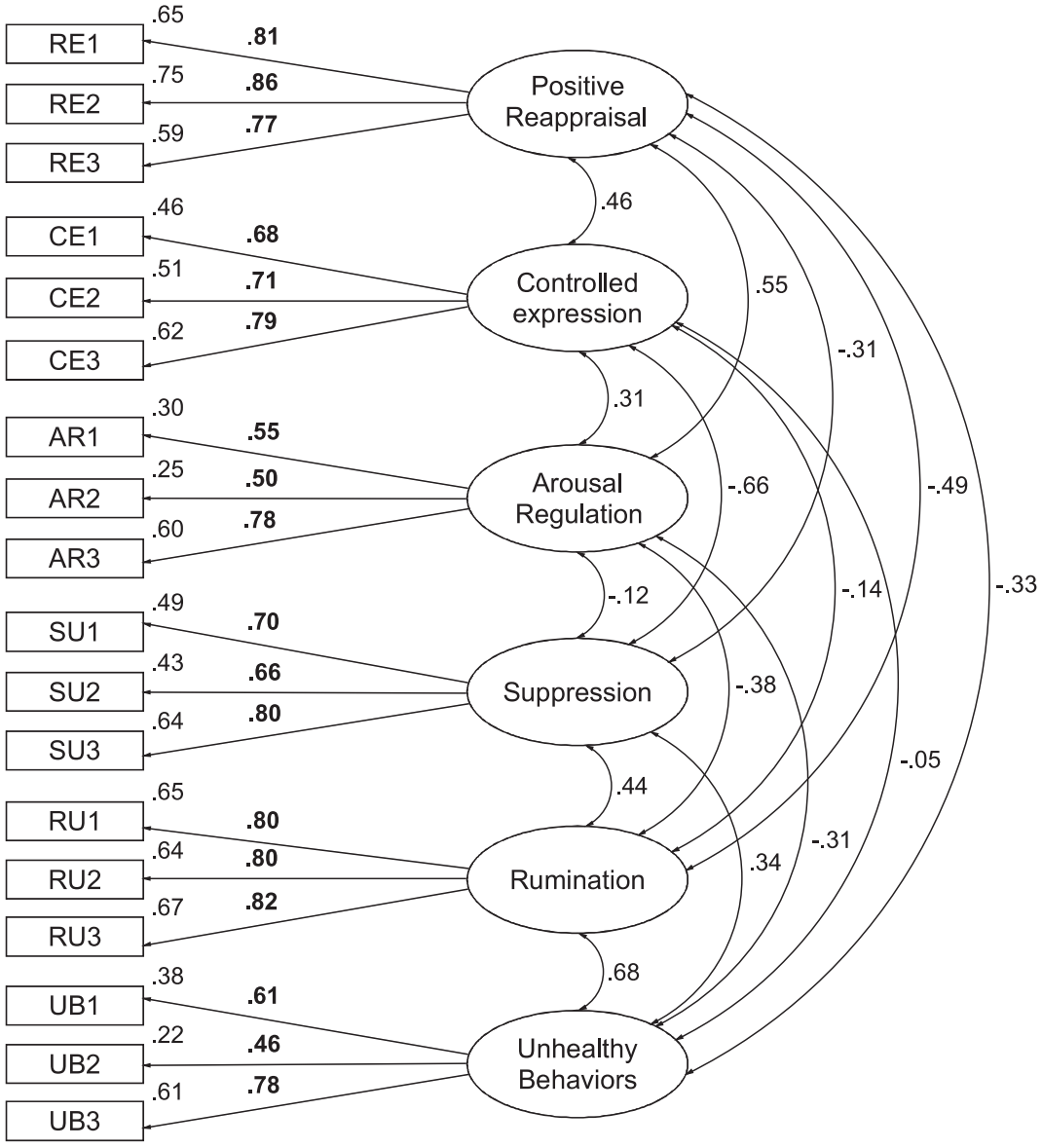

Fig. 2. Final standardized solution for the ESQ. Correlational model showing proportions of item explained variance, factor loadings and correlations between factors.
Note. Factor loadings appear in bold.

Table 2
Reliability and descriptive statistics of the ESQ factor scores for each dimension.

ESQ dimension	ω	ICC (95% CI)	*M* (*SD*)		
			Women	Men	Total
Positive reappraisal	0.86	0.66 (0.54–0.75)	7.90 (2.52)	7.57 (2.53)	7.82 (2.52)
Controlled expression	0.77	0.61 (0.48–0.71)	7.36 (2.10)	6.37 (2.21)*	7.12 (2.16)
Arousal regulation	0.64	0.70 (0.60–0.78)	5.46 (1.69)	5.72 (1.62)	5.53 (1.68)
Suppression	0.76	0.59 (0.46–0.69)	5.09 (1.95)	5.81 (2.11)*	5.25 (2.01)
Rumination	0.85	0.71 (0.61–0.79)	6.69 (2.62)	6.27 (2.37)	6.58 (2.57)
Unhealthy behaviors	0.66	0.72 (0.63–0.78)	4.28 (1.86)	3.90 (1.66)*	4.18 (1.82)

Note. ICC = intraclass correlation coefficient. CI = confidence interval.
* Significant mean differences appeared between women and men.

predicted SWL very similarly. These regression analyses are reported in Suppl. Tables 4 and 5.

3. Discussion

This study focused on the development of an ER measure. Results obtained speak generally in favor of the quality of the questionnaire. The SEM analyses supported a correlated factor structure that was found to be invariant across randomized subsamples and gender subsamples, underlining the soundness of the validity evidence of internal structure and supporting the idea that ER is a multidimensional construct. The different ER strategies are thus related to one another, but they are best understood as mostly independent strategies with no latent construct explaining them. The scores of the scales were also found generally reliable, except for Arousal Regulation and Unhealthy Behaviors, whose coefficients were below 0.70 (ω = 0.64 and 0.66, respectively). It is noteworthy that both strategies involve different behaviors (e.g., smoking, eating) that, although aimed at the same goal, are relatively independent of each other (e.g., Taylor, 2020), so people may tend to

Table 3
Expected associations and correlations of the ESQ scores with the TMMS, ERQ, PSS, and SWLS scores.

ESQ dimension	ERQ		TMMS			PSS	SWLS
	Cognitive reappraisal	Expressive suppression	Attention	Clarity	Repair		
Expected associations							
Positive reappraisal	++	−	+	+	+	−	+
Controlled expression	0	−−	+	+	+	−	+
Arousal regulation	+	−	+	+	+	−	+
Suppression	0	++	−	−	−	+	−
rumination	−	+	+	−	−	+	−
Unhealthy behaviors	−	+	+	−	−	+	−
Correlations							
Positive reappraisal	0.35***	−0.18***	0.07	0.34***	0.48***	−0.46***	0.40***
Controlled expression	0.07	−0.56***	0.31***	0.36***	0.18***	−0.16***	0.23***
Arousal regulation	0.34***	−0.10*	0.16***	0.31***	0.37***	−0.30***	0.20***
Suppression	0.00	0.59***	−0.11**	−0.27***	−0.10*	0.32***	−0.25***
Rumination	−0.26***	0.14***	0.31***	−0.20***	−0.36***	0.60***	−0.39***
Unhealthy behaviors	−0.17***	0.11**	0.21***	−0.15***	−0.21***	0.46***	−0.33***

Note. A double sign (++ or −−) indicates that the correlation with that ESQ dimension is expected to be higher than with other ESQ dimensions. ERQ = Emotion Regulation Questionnaire. TMMS = Trait Meta-Mood Scale. PSS = Perceived Stress Scale. SWLS = Satisfaction With Life Scale.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

use some but not all, hence reducing the internal consistency. The temporal stability of the scores was moderate in all cases.

Our results also provided validity evidence of the relations of the ESQ scores to other measures. As expected, the ERQ dimension of Expressive Suppression showed the strongest correlations with Controlled Expression and Suppression (a negative and a positive correlation, respectively). Again as expected, Positive Reappraisal showed a moderate positive association with the ERQ dimension of Cognitive Reappraisal. Also as anticipated, the remaining ESQ strategies were weakly correlated with the two ERQ dimensions, except for Arousal Regulation, which showed a moderate correlation with Cognitive Reappraisal. Moreover, stress and SWL were significantly related to the ESQ strategies in the expected direction, coherently with previous literature (e.g. Aldao et al., 2010; Aldao & Nolen-Hoeksema, 2012; Schäfer et al., 2017).

Regarding the TMMS, Clarity and Repair were associated positively with Positive Reappraisal, Controlled Expression, and Arousal Regulation, and negatively with Suppression, Rumination, and Unhealthy Behaviors, as expected. As for the Attention dimension, the strategies involving such attention showed positive associations, as expected, except for Positive Reappraisal. Attention had small associations with the rest of the ESQ strategies, consistently with research showing that emotional awareness had weak or absent associations with ER and psychopathology (Hallion et al., 2018). The strategy not involving attention to the emotion (i.e., Suppression) showed a negative association with Attention, also as expected.

Concerning gender, and congruently with previous literature, women tended to suppress emotions less than men and use unhealthy behaviors more (Gross & John, 2003; Peltier et al., 2019). Finally, the ESQ scores did a better job than the ERQ scores at predicting stress, and both did similar concerning SWL.

Our study presents some strengths and limitations. One strength is the effort made to study validity evidence of internal structure and relations to other variables, as well as reliability both in terms of internal consistency and temporal stability. However, future research might add more items to the Arousal Regulation and Unhealthy Behaviors scales to increase their internal consistency. Another strength is the relatively large sample of participants, which allowed for the multigroup analyses testing the invariance of the measurement model across subsamples. A relevant limitation has to do with the sampling method, which may have biased the sample. Regarding age, the Spanish population mean age in 2021 was 43.80 years, according to the National Institute of Statistics, which was similar in our study. However, concerning gender, women were overrepresented, which is nevertheless common in research (e.g., Dunn et al., 2004) and did not seem to be a problem in this case, as the multigroup analysis showed gender invariance. We also did not consider the context of the emotion or its intensity, which is something worth doing. Finally, future research would be wise to standardize and scale this tool to facilitate scores interpretation.

In summary, this paper provides the scientific community with an ER questionnaire based on a sound theoretical framework. This questionnaire assesses six ER strategies that cover the different steps of the emotion generation process (attention, appraisal, response) and emotion dimensions (cognitive, physiological, behavioral) with only 18 items, which can be quite convenient both for research and clinical practice.

CRediT authorship contribution statement

Helena Garrido-Hernansaiz: Conceptualization, Methodology, Validation, Formal analysis, Investigation, Data curation, Writing – original draft, Writing – review & editing, Visualization. **Rocío Rodríguez-Rey:** Conceptualization, Methodology, Formal analysis, Investigation, Writing – original draft, Writing – review & editing, Visualization. **Carmen Nieto:** Conceptualization, Methodology, Investigation, Writing – review & editing. **Jesús Alonso-Tapia:** Conceptualization, Methodology, Investigation, Writing – review & editing, Supervision, Project administration, Funding acquisition.

Acknowledgments

This work was carried out with funding from the Ministerio de Economía y Competitividad (Project EDU2017-89036-P).

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.paid.2022.111610.

References

Aldao, A., & Nolen-Hoeksema, S. (2012). When are adaptive strategies most predictive of psychopathology? *Journal of Abnormal Psychology, 121*(1), 276–281. https://doi.org/10.1037/a0023598

Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion regulation strategies across psychopathology: A meta-analysis. *Clinical Psychology Review, 30*, 217–237. https://doi.org/10.1016/j.cpr.2009.11.004

Cabello, R., Salguero, J. M., Fernández-Berrocal, P., & Gross, J. 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

Chervonsky, E., & Hunt, C. (2017). Suppression and expression of emotion in social and interpersonal outcomes: A meta-analysis. *Emotion, 17*(4), 669–683. https://doi.org/10.1037/emo0000270

De France, K., & Hollenstein, T. (2017). Assessing emotion regulation repertoires: The regulation of emotion systems survey. *Personality and Individual Differences, 119*, 204–215. https://doi.org/10.1207/s15327752jpa4901_13

Diener, E. D., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment, 49*(1), 71–75.

DiStefano, C., Zhu, M., & Mîndrilă, D. (2009). Understanding and using factor scores: Considerations for the applied researcher. *Practical Assessment, Research, and Evaluation, 14*, Article 20. https://doi.org/10.7275/da8t-4g52

Dunn, K. M., Jordan, K., Lacey, R. J., Shapley, M., & Jinks, C. (2004). Patterns in consent in epidemiological research: Evidence from over 25,000 responders. *American Journal of Epidemiology, 159*, 1067–1094.

Efferdinger, C., König, D., Klaus, A., & Jagsch, R. (2017). Emotion regulation and mental well-being before and six months after bariatric surgery. *Eating and Weight Disorders, 22*(2), 353–360. https://doi.org/10.1007/s40519-017-0379-8

Fernández-Berrocal, P., Extremera, N., & Ramos, N. (2004). Validity and reliability of the Spanish modified version of the Trait Meta-Mood Scale. *Psychological Reports, 94*(3), 751–755. https://doi.org/10.2466/pr0.94.3.751-755

Garnefski, N., & Kraaij, V. (2007). The cognitive emotion regulation questionnaire: Psychometric features and prospective relationships with depression and anxiety in adults. *European Journal of Psychological Assessment, 23*, 141–149.

Gross, J. J. (2008). Emotion regulation. In I. M. Lewis, J. M. Haviland-Jones, & L. Feldman Barrett (Eds.), *Handbook of emotions* (3rd ed., pp. 497–512). Guilford Press.

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*(2), 348–362. https://doi.org/10.1037/0022-3514.85.2.348

Hair, J. F. (2014). *A primer on partial least squares structural equations modeling (PLS-SEM)*. Sage.

Hallion, L. S., Steinman, S. A., Tolin, D. F., & Diefenbach, G. J. (2018). Psychometric properties of the Difficulties in Emotion Regulation Scale (DERS) and its short forms in adults with emotional disorders. *Frontiers in Psychology, 9*, Article 539. https://doi.org/10.3389/fpsyg.2018.00539

Kobylińska, D., & Kusev, P. (2019). Flexible emotion regulation: How situational demands and individual differences influence the effectiveness of regulatory strategies. *Frontiers in Psychology, 10*, Article 72. https://doi.org/10.3389/fpsyg.2019.00072

Koo, T. K., & Li, M. Y. (2016). A guideline of selecting and reporting intraclass correlation coefficients for reliability research. *Journal of Chiropractic Medicine, 15*(2), 155–163. https://doi.org/10.1016/j.jcm.2016.02.012

Kraaij, V., & Garnefski, N. (2019). The Behavioral Emotion Regulation Questionnaire: Development, psychometric properties, and relationships with emotional problems and the Cognitive Emotion Regulation Questionnaire. *Personality and Individual Differences, 137*, 56–61. https://doi.org/10.1016/j.paid.2018.07.036

Larsen, R. J., & Prizmic, Z. (2004). Affect regulation. In K. D. Vohs, & R. F. Baumeister (Eds.), *Handbook of self-regulation: Research, theory, and applications* (pp. 40–61). Guilford Press.

Liu, Y., Song, Y., Koopmann, J., Wang, M., Chang, C.-H.(. D.)., & Shi, J. (2017). Eating your feelings? Testing a model of employees' work-related stressors, sleep quality, and unhealthy eating. *Journal of Applied Psychology, 102*(8), 1237–1258. https://doi.org/10.1037/apl0000209

Liu, D. Y., & Thompson, R. J. (2017). Selection and implementation of emotion regulation strategies in major depressive disorder: An integrative review. *Clinical Psychology Review, 57*, 183–194. https://doi.org/10.1016/j.cpr.2017.07.004

Peltier, M. R., Verplaetse, T. L., Mineur, Y. S., Petrakis, I. L., Cosgrove, K. P., Picciotto, M. R., & McKee, S. A. (2019). Sex differences in stress-related alcohol use. *Neurobiology of Stress, 10*, Article 100149. https://doi.org/10.1016/j.ynstr.2019.100149

Remor, E. (2006). Psychometric properties of a European Spanish version of the Perceived Stress Scale (PSS). *The Spanish Journal of Psychology, 9*(1), 86–93. https://doi.org/10.1017/S1138741600006004

Salovey, P., Mayer, J. D., Goldman, S. L., Turvey, C., & Palfai, T. P. (1995). Emotional attention, clarity, and repair: Exploring emotional intelligence using the trait meta-mood scale. In J. W. Pennebaker (Ed.), *Emotion, disclosure, & health* (pp. 125–154). American Psychological Association.

Schäfer, J.Ö., Naumann, E., Holmes, E. A., Tuschen-Caffier, B., & Samson, A. C. (2017). Emotion regulation strategies in depressive and anxiety symptoms in youth: A meta-analytic review. *Journal of Youth and Adolescence, 46*(2), 261–276. https://doi.org/10.1007/s10964-016-0585-0

Taylor, S. E. (2020). *Health psychology* (11th ed.). McGraw Hill.

Vázquez, C., Duque, A., & Hervás, G. (2013). Satisfaction with life scale in a representative sample of Spanish adults: Validation and normative data. *The Spanish Journal of Psychology, 16*, Article E82. https://doi.org/10.1017/sjp.2013.82