

Portuguese validation of the Emotion Regulation Questionnaire for Children and Adolescents (ERQ-CA): relations with self-esteem and life satisfaction

Ana Teixeira · Eliana Silva · Dionísia Tavares ·
Teresa Freire

Accepted: 12 August 2014 / Published online: 17 August 2014
© Springer Science+Business Media Dordrecht 2014

Abstract Despite the growing study of adolescents' emotion regulation (ER) and its importance for developmental trajectories, research has focused mainly on psychopathology by contrast with positive functioning. The lack of adequate age measures on emotion regulation has been also largely recognized. The present study aims to explore psychometric properties and construct validity of the Emotion Regulation Questionnaire for Children and Adolescents (ERQ-CA) (Gullone and Taffe, 2012) in a sample of 809 Portuguese adolescents. The Portuguese version (QRE-CA) showed adequate reliability and the Confirmatory Factorial Analysis presented a good fit confirming the two-factor model found by Gullone and Taffe (2012). Measurement invariance tests showed intergroup invariance for gender and school grade. Additionally, convergent validity showed positive associations between the reappraisal strategy and measures of positive psychological functioning (self-esteem and satisfaction with life). The suppression strategy presented negative associations with those same variables.

Findings suggest that the QRE-CA is a valid and reliable measure for evaluating strategies of ER. Final considerations highlight the importance of extending research on adolescents' emotion regulation and positive functioning.

Keywords Emotion regulation · Reappraisal · Suppression · Adolescence · Positive functioning · Measurement

1 Introduction

In the last three decades, there has been a substantial recognition of the importance of emotion regulation in psychological human functioning (Morris et al. 2007). An important component of healthy psychosocial and emotional functioning is learning how to manage emotions in socially and contextually adaptive ways (Gullone et al.

A. Teixeira · E. Silva · D. Tavares · T. Freire (✉)
School of Psychology, University of Minho, Campus de Gualtar, 4710-057 Braga, Portugal
e-mail: tffreire@psi.uminho.pt

2010; Morris et al. 2007), making emotion dysregulation to be associated with the development of psychopathology (Gross 2002; Southam-Gerow and Kendall 2002; Silk et al. 2003).

Emotion regulation is consistently defined by intrinsic (e.g., emotional cognitions) and extrinsic processes (e.g., parental support), which are responsible for monitoring, evaluating, and managing individuals' emotions toward goal achievement (Gross and Thompson 2007; Thompson 2011). Emotional regulatory processes can be automatic or controlled, conscious or unconscious, and it is increasingly recognized that it integrates management of both positive and negative emotions (Gross and Thompson 2007). Regulatory mechanisms also include skills and strategies that modulate the specific emotion experienced and its emotional dynamics (e.g., intensity, duration, lability) (Gross and Thompson 2007; Morris et al. 2007).

To date, the majority of the studies on emotion regulation have typically focused on developmental periods of infancy, early childhood and adulthood, but only few are about adolescents (Jaffe et al. 2010). This is a significant limitation of current research given that adolescence is an important period to explore emotions and their regulatory processes (Gilbert 2012; Gross and Thompson 2007). Transition to adolescence is characterized by physical, psychological and social transformations that elicit new experiences of emotional arousal and more intense and extreme emotional experiences (Gilbert 2012). These experiences create a greater need to regulate emotions and occur in parallel to improvements in regulatory skills facilitated by hormonal, neurological and cognitive development (Gross and Thompson 2007; Steinberg 2005). Due to these changes and growth, adolescence is a susceptible period to both risks and opportunities in terms of emotion regulation development (Gilbert 2012; Steinberg 2005).

In comparison to the well-recognized relationship between emotion dysregulation and the onset of internalizing and externalizing disorders in adolescents (Gilbert 2012; McLaughlin et al. 2011; Silk et al. 2003; Southam-Gerow and Kendall 2002; Zeman et al. 2007), the impact of emotion regulation on the healthy functioning has been less studied both theoretically and empirically. Adolescents who are able to experience positive emotions tend to get more satisfaction at school (Bordwine and Huebner 2010) or during stressful periods, they may demonstrate fewer depressive symptoms and better resiliency toward psychopathology (Gilbert 2012).

Apart from the recognized importance of adolescents' emotion regulation, some limitations have been identified in current studies as the lack of validated age-appropriate measures and the absence of a robust and unified theoretical framework (Gullone et al. 2010; Neumann et al. 2010). An exception is the Gross's (1998) process model of emotion regulation increasingly applied to adolescent research (e.g., Freire and Tavares 2011; Jaffe et al. 2010; Gullone et al. 2010). This model has been receiving a great deal of empirical attention; it suggests that specific regulatory strategies can be differentiated along the emotional response (Gross 1998, 2002; John and Gross 2004). In this sense, the model distinguishes between antecedent focused emotion regulation strategies and response focused strategies (John and Gross 2004). Antecedent emotion regulation strategies refer to what is adopted before the emotion-response tendencies have become completely activated and the latter occurs after the emotional responses have been generated. Two strategies have been operationalized by the model (one antecedent-focused and one response-focused) and have received a substantial amount of research attention (Gross and John 2003). These strategies are respectively: a)

cognitive reappraisal, a type of cognitive change, which consists of changing how we think about a situation in order to decrease its emotional impact, and b) expressive suppression, a form of response modulation that involves inhibiting or reducing emotion-expressive behavior (Gross 1998, 2002; John and Gross 2004).

In order to understand the existence of individual differences in the use of reappraisal and suppression strategies, Gross and John (2003) developed the Emotion Regulation Questionnaire (ERQ) for adults. Research studies with ERQ revealed that the chronic use of each strategy has diverse implications on affective experiences. Specifically, greater use of expressive suppression has been found to be associated with lower levels of positive and negative emotion expression and lesser positive emotion experience. By contrast, the chronic use of reappraisal increases the experience and expression of positive emotions and decreases the experience and expression of negative emotions (Cabello et al. 2013; Gross 2002; Gross and Thompson 2007; Gross and John 2003; John and Gross 2004). Studies had also found that suppressors report more depressive symptoms and have lower levels of life satisfaction, well-being and self-esteem. On the contrary, individuals who habitually use reappraisal have fewer depressive symptoms, are more satisfied with their lives and more optimistic, and they also have better self-esteem (Gross and John 2003; John and Gross 2004).

Gullone and Taffe (2012) adapted the ERQ for children and adolescents (Emotion Regulation Questionnaire for Children and Adolescents; ERQ-CA). The ERQ-CA proved to be a valid and age-appropriate questionnaire for evaluating the use of the two different strategies of emotion regulation within this age group. As in adult samples, these two emotion regulation strategies were associated with different outcomes. Adolescents who used more suppression strategy showed higher depressive symptoms, higher neuroticism, lower scores of extraversion, agreeableness and conscientiousness. By contrast, adolescent use of reappraisal strategy was negatively associated with depressive symptoms and neuroticism. Moreover, a greater use of this strategy was associated with higher extraversion, agreeableness, conscientiousness and openness to experience (Gullone and Taffe 2012).

According to this, our goal for the present study was to validate the Emotion Regulation Questionnaire for Children and Adolescents (ERQ-CA; Gullone and Taffe 2012) to a Portuguese sample of adolescents. This study aimed to test whether this Portuguese version would replicate the original scale results concerning reliability, factorial structure, and relations to other constructs; and to test measurement invariance in order to evaluate if the measured constructs have the same meaning across subgroup samples, regardless of group membership (Milfont and Fischer 2010). To the best of our knowledge, this is the first validation study of ERQ-CA in a different language from the original scale.

Existing research about emotion regulation is focused mostly on its predictive power of psychological distress and disorders (e.g., Balzarotti et al. 2010; Gullone and Taffe 2012). The present study focuses on the importance of emotion regulation for a healthy psychological profile and positive functioning. In this sense, as a test of convergent validity, we investigated the associations between emotion regulation strategies of the ERQ-CA and positive functioning, specifically in terms of self-esteem and life satisfaction. We hypothesized that cognitive reappraisal strategy would be positively associated with self-esteem and life-satisfaction, and that expressive suppression strategy would be negatively associated with self-esteem and life satisfaction.

2 Method

2.1 Participants

Participants were 809 adolescents (58.84 % of girls), from the 9th to the 12th grade, aged between 14 and 18 years old ($M=15.97$, $SD=1.21$). Table 1 reports the percentages, means and standard deviations of the demographic characteristics analyzed in this study.

2.2 Measures

Demographic questionnaire –all participants completed a brief questionnaire that included items assessing age, gender and school year.

Emotion Regulation Questionnaire – Children and Adolescents (ERQ-CA, Gullone and Taffe 2012; Questionário de Regulação Emocional - Crianças e Adolescentes, QRE-CA, Portuguese translation) – the ERQ-CA is a ten-item self-report measure that assesses individual differences in the use of two different emotion regulation strategies, namely Cognitive Reappraisal (CR) and Expressive Suppression (ES). The ERQ-CA is based on the original questionnaire of Gross and John (2003) for adult samples. Gullone and Taffe made some revisions on the structure for this children and adolescents' version, namely the simplification of the item wording and the reduction of the length of the response scale. The items are rated in a 5-point Likert-type response scale (1=strongly disagree to 5=strongly agree). The CR subscale comprises 6 items (1, 3, 5, 7, 8 and 10) and the ES subscale comprises 4 items (2, 4, 6 and 9). Scores are based on the sum of all items, for each subscale. There are no reverse items. The scores on each subscale range from 6 to 30 (CR) and from 4 to 20 (ES). Higher scores on each subscale mean greater use of the correspondent strategy. The ERQ-CA has shown good internal consistency ($\alpha=0.83$ for CR; $\alpha=0.75$ for ES) and stability over a 12-month period (for CR subscale the coefficients ranged from 0.37 to 0.43 and for ES subscale they ranged from 0.49 to 0.63), as well as adequate convergent validity (Gullone and Taffe 2012). The Portuguese QRE-CA maintained the same structure of (Gullone and Taffe 2012). Items of the ERQ-CA, for both strategies, are presented in Table 2 with the corresponding translated Portuguese items (QRE-CA).

Table 1 Demographic characteristics of the participants

	Gender						Age (years)	
	Girls		Boys		Total			
School grade	N	Percentage	N	Percentage	N	Percentage	Mean	SD
9th grade	64	45.71	76	54.29	140	17.31	14.34	0.59
10th grade	164	62.84	97	37.16	261	32.26	15.45	0.74
11th grade	132	60.27	87	39.73	219	27.07	16.44	0.68
12th grade	116	61.38	73	38.62	189	23.36	17.36	0.48
Total	476	58.84	333	41.16	809	100.00	15.97	1.21

Table 2 The Emotion Regulation Questionnaire for Children and Adolescents (ERQ-CA) and Portuguese translated version (QRE-CA)

	ERQ-CA (Gullone and Taffe 2012)	QRE-CA (Portuguese items)
Cognitive reappraisal	1. When I want to feel happier, I think about something different. 3. When I want to feel less bad (e.g. sad, angry or worried), I think about something different. 5. When I'm worried about something, I make myself think about it in a way that helps me feel better. 7. When I want to feel happier about something, I change the way I'm thinking about it. 8. I control my feelings about things by changing the way I think about them. 10. When I want to feel less bad (e.g. sad, angry or worried) about something, I change the way I'm thinking about it.	1. Quando quero sentir-me mais feliz, penso numa coisa diferente. 3. Quando quero sentir-me menos mal (ex.: triste, zangado/a ou preocupado/a), penso numa coisa diferente. 5. Quando estou preocupado/a com alguma coisa, tento pensar nisso de uma forma que me ajude a sentir-me melhor. 7. Quando quero sentir-me mais feliz acerca de alguma coisa, mudo a forma como estou a pensar sobre isso. 8. Eu controlo os meus sentimentos acerca das coisas, mudando a forma como penso sobre elas. 10. Quando quero sentir-me menos mal (ex.: triste, zangado/a, ou preocupado/a) com alguma coisa, mudo a forma como estou a pensar sobre isso.
Expressive suppression	2. I keep my feelings to myself. 4. When I am feeling happy, I am careful not to show it. 6. I control my feelings by not showing them. 9. When I'm feeling bad (e.g. sad, angry or worried), I'm careful not to show it.	2. Guardo os meus sentimentos para mim próprio/a. 4. Quando estou a sentir-me feliz, tenho cuidado para não o mostrar. 6. Eu controlo os meus sentimentos não os mostrando. 9. Quando estou a sentir-me mal (ex.: triste, zangado/a, ou preocupado/a), tenho cuidado para não o mostrar.

Items ERQ-CA©2012 by Elconora Gullone and John Taffe; reprinted with permission

Rosenberg Self-Esteem Scale (RSES; Rosenberg 1965; Portuguese adolescent validation of Santos and Maia 2003) – the RSES is a ten-item self-report measure that evaluates general feelings of self-esteem in the respondent. The items are rated in a 4-point Likert-type response scale (1=strongly disagree to 4=strongly agree). Items 2, 5, 6, 8 and 9 are reversed. Higher scores represent a higher level of self-esteem and can range from 10 to 40. The Portuguese scale had shown high internal consistency ($\alpha=0.86$) (Santos and Maia 2003). In the present study, we obtained an alpha coefficient of 0.84.

Satisfaction with Life Scale (SWLS; Diener et al. 1985; Portuguese adolescent validation of Neto 1993) – the SWLS is a five-item self-report measure that assesses satisfaction with life as a whole. Respondents rate each item on a 7-point Likert-type response scale (1=strongly disagree to 7=strongly agree). The range of global score is 5 to 35 points. Higher scores represent a higher level of general satisfaction with life. The Portuguese scale for adolescents revealed good psychometric properties with an internal consistency of 0.86 and 2-week test-retest reliability ($\alpha=0.90$) (Neto 1993). In the present study, the internal consistency coefficient of the Portuguese SWLS was 0.84.

2.3 Procedure

2.3.1 *Sampling and scaling procedures*

Participants were recruited in the schools they attend, by means of convenience sampling. The research team explained the study to school directors. After obtaining their permission, we selected classes for participating according to their school schedule. Data collection occurred in classrooms. In each class, the researcher explained the purpose of the study and gave the instructions to fill in the questionnaires. Participants completed the questionnaires in about 15 min. The questionnaires were administered using counterbalanced order, because we administered more than one questionnaire to each participant. This design leads to concerns about carryover effects and order effects. Counterbalancing refers to exposing participants to different orders to ensure that such carryover and order effects fall equally on all conditions (Foley 2004).

A total of 843 students were approached and gave their informed consent to participate in this study. However, eighteen participants were excluded because they did not complete the questionnaires and other sixteen students because they were outside the 14 to 18 age's range of the present study. This resulted in a final sample of 809 participants.

A total of two researchers were involved in the data collection process. They were graduated students of psychology that received training on administration of questionnaires and data collection. The present study was conducted under a master's project in psychology and was approved by the scientific committee of the School of Psychology of the University of Minho. All ethical and deontological research principles were followed during the collection and processing of data (APA 2010).

The original ERQ-CA measure (Gullone and Taffe 2012) was first translated into Portuguese and then back translated by bilingual psychologists. Discrepancies in translation were solved through discussion to reach agreement on a common version. Some expressions were slightly altered in the Portuguese version in order to obtain the same connotation as in the original version.

2.3.2 *Statistical procedures*

In order to characterize our sample in terms of emotion regulation strategies and positive functioning, we generated descriptive statistics (i.e. means and standard deviations) for each emotion regulation subscale (reappraisal and suppression) and for self-esteem and life satisfaction variables.

To explore the psychometric properties of the QRE-CA, we performed reliability analysis for each emotion regulation subscale, using the Cronbach model of internal consistency that refers to the interrelatedness of a set of items (Gliem and Gliem 2003; Nunnally 1978). These analyses were conducted using SPSS (v. 18.0).

Then, we examined the construct validity of the QRE-CA, which tests the capacity of a scale to actually measure the construct that it proposes to measure (Westen and Rosenthal 2003). In this sense, we performed a Confirmatory Factor Analysis (CFA) using RStudio (v. 0.97) and the Lavaan package (Rosseel et al. 2013). The factorial analysis consists in a set of methods conducted to examine how latent variables (constructs) influence the response on the observed variables (DeCoster 1998). This

analysis provides information about how well the models tested fit the observed data. More specifically, through CFA analysis we examined the fit of the two-factor structure of the QRE-CA version (Gullone and Taffe 2012) for the total sample.

In addition, we included tests of model invariance to explore invariance across the different respondent subgroups, which is a required test when one intends to make valid and meaningful comparisons among groups (Milfont and Fischer 2010). All analyses were performed using maximum likelihood estimates. Since data presented a non-normal distribution, the goodness of fit was evaluated using Satorra-Bentler scaled test statistic, proposed by Satorra and Bentler (1994). We used the same procedure when comparing model fit between nested models. Missing values accounted for about 1 % of the data and were handled using full information maximum likelihood (FIML) method on CFA and on measurement invariance tests (Kline 2005; Köse 2014).

Therefore, we evaluated the adequacy of the data to the analyzed model using several measures of adjustment that are considered good measures of model fit, such as rescaled chi-square test (χ^2_{SB}), Comparative Fit Index (CFI), Tucker Lewis Index (TLI) and Root Mean Square Error of Approximation (RMSEA). The chi-square index is the most common and classic goodness-of-fit test to evaluate the adjustment of a model (DeCoster 1998). A non-significant chi-square suggests that the model fits the data. Jöreskog and Sörbom (1989) recommend the use of the ratio χ^2/df given the high sensitivity of the chi-square test to the sample size. Byrne (1989) suggests that values between 2.00 and 5.00 define appropriate adjustment for this index. For CFI and TLI indexes, values over 0.90 indicate an adequate adjustment (Bentler and Bonnet 1980), and over 0.95 a good adjustment. (Brown and Cudeck 1993) suggest that values near or below 0.05 in the RMSEA index are indicative of a close fit of the model.

Besides, we performed Pearson correlations between QRE-CA subscales and Rosenberg's Self-Esteem Scale and Satisfaction with Life Scale to test the convergent validity. Lastly, we conducted MANOVA tests to examine gender and school grade differences regarding emotion regulation strategies (reappraisal and suppression); and t-tests and ANOVA to explore gender and school grade differences on self-esteem and life satisfaction. These analyses were conducted using SPSS (v. 18.0).

3 Results

3.1 Descriptive Statistics

Table 3 shows the means and standard deviations for both reappraisal and suppression subscales according to gender and school grade. According to item mean scores, by gender or school grades, participants reported medium or higher values on reappraisal, showing greater use of this strategy. On the other hand, we can verify that they reported a lesser use of the suppression strategy.

Table 4 presents means and standard deviations of satisfaction with life and self-esteem across gender and school grades. According to item mean scores, boys revealed higher self-esteem and life satisfaction levels than girls. Concerning school grades different results exist among participants.

Table 3 Descriptive statistics and reliability for QRE-CA scales

Demographic groups		Reappraisal (6 items)					Suppression (4 items)				
		Total score Mean	Total score SD	Item Mean	Item SD	α	Total score Mean	Total score SD	Item Mean	Item SD	α
Gender	Girls	21.32	3.56	3.55	0.59	0.71	11.13	3.20	2.78	0.80	0.68
	Boys	21.26	3.64	3.54	0.61	0.69	11.56	2.87	2.89	0.72	0.61
School grade	9th grade	21.93	3.46	3.65	0.58	0.63	11.98	3.00	2.99	0.75	0.54
	10th grade	21.42	3.74	3.57	0.62	0.73	10.98	3.12	2.75	0.78	0.65
	11th grade	21.31	3.52	3.55	0.59	0.71	11.14	3.21	2.79	0.80	0.71
	12th grade	20.65	3.59	3.44	0.58	0.69	11.46	2.85	2.86	0.71	0.64
Total sample		21.30	3.59	3.55	0.60	0.70	11.31	3.08	2.83	0.77	0.65

SD=standard deviation; α =Cronbach alpha; Items Likert scale (1–5)

3.2 Reliability

Concerning Cronbach alpha analysis, results of the total sample showed an alpha of 0.70 for the reappraisal subscale and 0.65 for the suppression subscale (Table 3). When we take in consideration sample subgroups, Cronbach coefficients were also higher for the reappraisal subscale than suppression.

3.3 Construct Validity

In order to test factor structure and construct validity of the QRE-CA, we tested three models using CFA. We first tested a two-factor structure model with factor intercorrelation freely estimated (model A). Then, we tested the same model, but added a constraint specifying that measurement errors of item 1 and item 3 are correlated (model B) in order to achieve an acceptable model fit. For this, we used the same model constraint as the Australian validation study did (Gullone and Taffe 2012) since items 1 and 3 in the Portuguese version have a similar formulation. Finally, we tested

Table 4 Descriptive statistics of Satisfaction with Life (SWLS) and Self-Esteem (RSES) scales

Demographic groups		Satisfaction with Life (5 items)				Self-Esteem (10 items)			
		Mean	SD	Min.	Max.	Mean	SD	Min.	Max.
Gender	Girls	4.65	1.25	1.70	3.90	2.97	0.45	1.70	3.90
	Boys	4.73	1.26	1.20	7.00	3.13	0.46	1.50	4.00
School grade	9th grade	4.59	1.35	1.20	6.80	3.10	0.52	1.90	3.90
	10th grade	4.83	1.17	1.20	7.00	3.00	0.46	1.70	4.00
	11th grade	4.52	1.26	1.40	6.80	3.03	0.45	1.50	3.90
	12th grade	4.73	1.27	1.40	7.00	3.07	0.41	1.80	3.90
Total sample		4.68	1.25	1.20	7.00	3.04	0.46	1.50	4.00

SD=standard deviation. SWLS items Likert scale (1–7); RSES items Likert scale (1–4)

again model B, but added a constraint forcing correlation between factors to be zero, or in other words, forcing them to be orthogonal (model C). Bartlett's test of sphericity was significant, $\chi^2(45)=1418.009$, $p<0.001$, indicating that there are correlations in the data that are appropriate for factor analysis.

As can be seen in Table 5, the results of model A were below satisfactory values for all analyzed indices, indicating a poor fit to the data. Standardized coefficients between the observed variables and latent variables ranged between 0.41 and 0.74 and were statistically significant ($p<0.001$).

On the other hand, results of model B indicated a good fit to the data for all analyzed fit indices. All path coefficients of the factors for the assessed variables ranged between 0.34 and 0.74 and were statistically significant ($p<0.001$). With the re-specifications of the model, the standardized coefficients of items 1 and 3 became lower than 0.40. However, this result did not compromise the quality of the data adjustment to the model. Models A and B showed a significant standardized correlation between the two factors ($\Phi=0.26$) that was left to be freely estimated.

Finally, model C also showed a good fit to the data for all analyzed indices of adjustment. Standardized path coefficients ranged between 0.34 and 0.74 as well and were significant ($p<0.001$). The total variance explained by this model is 54.7 %.

Models B and C were the ones that showed a better fit to the data. We used the Bayesian Information Criterion (BIC) to make comparisons between these two models (the model with the lowest value is considered the better). Looking at the BIC values on Table 5, model B seems to have a better fit. Nevertheless, according to the literature, when we make model comparisons we should prefer the more parsimonious model (if the fit is equally good), because it has less parameters to estimate (Preacher 2006). Also, the decision between models should rely on previous research (Preacher 2006). Studies with the ERQ-CA have shown that reappraisal and suppression subscales are orthogonal, meaning that these are two independent emotion regulatory strategies (Balzarotti et al. 2010; Cabello et al. 2013; Gross and John 2003; Gullone and Taffe 2012; John and Gross 2004; Melka et al. 2011). Hence, for these two reasons we chose model C (Fig. 1).

3.4 Measurement of invariance

We performed multiple-group invariance analysis to explore invariance across different respondent subgroups (gender and school grades). This kind of testing includes a number

Table 5 Goodness of Fit Indices of Confirmatory Factor Analysis

	χ^2_{SB}	df	χ^2_{SB}/df	RMSEA	CFI	TLI	BIC
Model A	208.644*	34	6.14	0.09	0.85	0.80	17550.922
Model B	80.303*	33	2.43	0.04	0.96	0.94	17429.060
Model C	103.312*	34	3.04	0.06	0.94	0.92	17445.590

χ^2_{SB} =rescaled chi-square statistic; df=degrees of freedom; χ^2_{SB}/df =ratio between rescale chi-square and degrees of freedom; RMSEA, root mean square error of approximation; CFI, comparative fit index; TLI, Tucker Lewis Index; BIC, Bayesian information criterion

* $p<0.05$

of sequential analyses with progressively restricted models (Jovanović 2013). First, we fitted the factor structure separately for each gender and school grade group. Then, we presented four different models to perform model comparison tests: model 1, where the same factor structure is imposed to groups (configural invariance); model 2, where factor loadings are constrained to be equal across groups (metric invariance); model 3, where factor loadings and intercepts are constrained to be equal across groups (scalar invariance); and model 4, where factor loadings, intercepts and means are constrained to be equal across groups (factor mean invariance) (Milfont and Fischer 2010). Model 1 is considered a baseline model from which we compare the more restrictive models, indicating a total absence of invariance (Black et al. 2012). These nested models are in a hierarchical order where constraints are added in sequence (Milfont and Fischer 2010). Invariance across groups suggests that the different groups conceptualize both constructs (reappraisal and suppression) in the same way (Hortensius 2012).

Each model was compared with its previous, using several fit indices. The chi-square difference test ($\Delta\chi^2$) is often used to test the invariance degree (Bollen 1989). Non-significant changes in chi-square suggest inter-groups invariance. However, as said before, this test depends greatly on sample size (Bentler and Bonnet 1980; Byrne 1994; Jöreskog and Sörbom 1989), especially with sample sizes over 500 (Hortensius 2012). Therefore, instead of relying in just one index it is recommended the use of other fit measures (CFI, RMSEA and BCI). The cutoff point suggested in the literature to accept the hypothesis of invariance across groups is a change of ≤ -0.01 for CFI (Cheung and Rensvold 2002; Hortensius 2012).

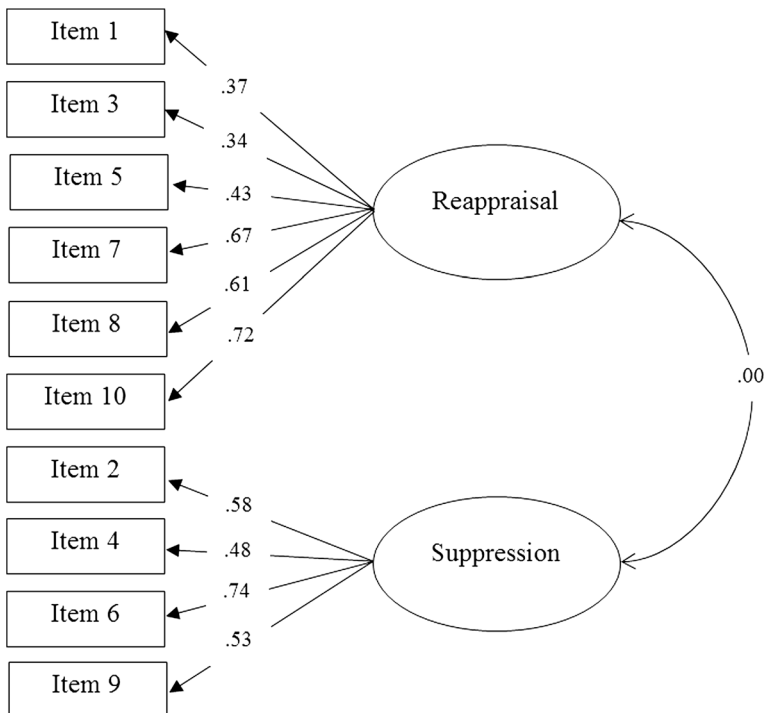


Fig. 1 Path diagram of the two-factor confirmatory factor analysis of the ERQ-CA (model C)

Regarding gender groups, we can see in Table 6 that girls presented better fit indices than boys (single group CFA). In general, all four models showed adequate fit for CFI and RMSEA indices. The baseline model showed an adequate fit for CFI (above 0.90) and for RMSEA (less than 0.08). Chi-square differences were non-significant between models 1 and 2 and between models 2 and 3. Changes on CFI were minimal ($\Delta\text{CFI}=0.006$) for models 2 and 3. On the other hand, we obtained a significant chi-square difference between models 3 and 4, but the cutoff criteria for CFI was achieved ($\Delta\text{CFI}=0.006$). These results seem to present reasonable evidence of measurement invariance across gender.

Table 7 presents the results for measurement invariance across different school grade groups. Single group CFA results presented a better fit of the data for the 12th grade group (a non-significant chi-square was obtained and CFI was above 0.95) in comparison with other school grades. All nested models showed a good fit for all analyzed indexes. All models obtained a non-significant chi-square difference and minimal changes on CFI ($\Delta\text{CFI}<0.01$), suggesting invariance across school grade groups. Therefore, we can conclude that the different participants seem to conceptualize in the same manner latent variables (reappraisal and suppression), independently of their grade group membership.

3.5 Convergent validity

As expected, we found significant positive associations between reappraisal and self-esteem, and reappraisal and satisfaction with life (see Table 8). Besides, we found significant negative associations between suppression and self-esteem, and between suppression and life satisfaction.

Focusing on gender, the positive associations between reappraisal and self-esteem, and reappraisal and satisfaction with life were only significant for the girls' subgroup, meaning that a greater use of reappraisal strategy by girls is associated with higher levels of self-esteem and satisfaction with life. On the other hand, suppression was negatively associated with self-esteem and life satisfaction for both boys and girls.

Table 6 Test of measurement invariance (gender)

	χ^2_{SB}	df	CFI	RMSEA	BIC	$\Delta\chi^2_{SB}$	Δdf	ΔCFI
Single group								
Girls	82.260*	35	0.946	0.054	12494.585			
Boys	102.009*	35	0.874	0.077	8820.306			
Measurement Invariance								
Model 1	133.706*	68	0.932	0.054	21357.505			
Model 2	147.679*	76	0.926	0.054	21325.997	13.972	8	0.006
Model 3	161.417*	84	0.920	0.053	21290.870	13.275	8	0.006
Model 4	169.100*	86	0.914	0.054	21282.747	9.304*	2	0.006

χ^2_{SB} =rescaled chi-square statistic; df=degrees of freedom; CFI, comparative fit index; RMSEA, root mean square error of approximation; BIC, Bayesian information criterion; $\Delta\chi^2_{SB}$ =difference between two rescaled χ^2_{SB} statistics calculated by Satorra and Bentler (1994) procedures; Δdf =difference in degrees of freedom; ΔCFI =difference in CFI

* $p<0.05$

In terms of school grades, we found a significant positive association between reappraisal and self-esteem only for the 11th grade subgroup., Reappraisal was positively and significantly associated with satisfaction with life for both 10th and 11th grades. In contrast, suppression was negatively and significantly associated with self-esteem and life satisfaction for all school grade groups (except for the 10th grade regarding satisfaction with life).

3.6 Gender and school grade differences

As groups have unequal sample sizes, we conducted chi-square tests to examine the need for adjustments in the MANOVAs, such as using Pillai’s trace (Tweedy and Lunardelli 2001). Chi-square results showed non-significant relations between reappraisal and gender, $\chi^2(22, N=809)=16.35, p=0.798$, and between reappraisal and school grade, $\chi^2(66, N=809)=59.31, p=0.707$. Results also showed non-significant relations between suppression and gender, $\chi^2(16, N=809)=21.16, p=0.172$, and between suppression and school grade, $\chi^2(48, N=809)=56.34, p=0.191$. Since all chi-square results were non-significant, it does not require any adjustment.

Regarding gender, there were no significant Multivariate main effects, Wilks’ Lambda=0.99, $F(2,783)=2.02, p=0.133$, partial eta=0.005, power=0.418. This means that the independent variable (gender) did not produce an effect on the set of the two dependent variables (reappraisal and suppression). However, Univariate analysis showed that there was a significant difference in suppression mean scores between girls and boys, $F(1,784)=3.73, p<0.05$, partial eta=0.005, power=0.056, revealing that boys scored higher than girls on the suppression subscale (see table 3). Besides, Univariate analysis showed that there was not a significant difference in reappraisal mean scores between girls and boys, $F(1,784)=0.05, p=0.825$, partial eta=0.000, power=0.056.

Table 7 Test of measurement invariance (school grade groups)

	χ^2_{SB}	df	CFI	RMSEA	BIC	$\Delta\chi^2_{SB}$	Δ df	Δ CFI
Single group								
9th grade	71.080*	35	0.836	0.087	3864.341			
10th grade	56.086*	35	0.949	0.049	7006.452			
11th grade	79.368*	35	0.891	0.077	5734.060			
12th grade	47.535	35	0.960	0.044	4922.933			
Measurement Invariance								
Model 1	145.261*	102	0.955	0.044	17771.688			
Model 2	165.130*	118	0.951	0.043	17691.069	19.811	16	0.004
Model 3	179.286*	134	0.953	0.039	17599.380	12.456	16	-0.002
Model 4	187.288*	138	0.949	0.041	17581.397	8.701	4	0.004

χ^2_{SB} =rescaled chi-square statistic; df=degrees of freedom; CFI, comparative fit index; RMSEA, root mean square error of approximation; BIC, Bayesian information criterion; $\Delta\chi^2_{SB}$ =difference between two rescaled χ^2_{SB} statistics calculated by (Satorra and Bentler 1994) procedures; Δ df=difference in degrees of freedom; Δ CFI=difference in CFI

* $p<0.05$

Table 8 Pearson correlations between QRE-CA scales, RSES and SWLS

Sample	Scale	RSES	SWLS
Overall sample	Reappraisal	0.15***	0.11**
	Suppression	-0.18***	-0.20***
Girls	Reappraisal	0.19***	0.17***
	Suppression	-0.18***	-0.20***
Boys	Reappraisal	0.10	0.02
	Suppression	-0.22***	-0.22***
9th grade	Reappraisal	0.07	0.15
	Suppression	-0.35***	-0.33***
10th grade	Reappraisal	0.12	0.12*
	Suppression	-0.15*	-0.10
11th grade	Reappraisal	0.25***	0.15*
	Suppression	-0.15*	-0.24***
12th grade	Reappraisal	0.13	0.02
	Suppression	-0.16*	-0.20**

* $p < 0.05$; ** $p < 0.01$; ***
 $p < 0.001$

Concerning school grades, results revealed a significant multivariate main effects, Wilks' Lambda=0.98, $F(6, 1562)=3.43$, $p < 0.01$, partial eta=0.013, power=0.946. This means that the school grade variable produced an effect on reappraisal, $F(3, 782)=3.50$, $p < 0.05$, partial eta=0.013, power=0.781; and on suppression mean scores, $F(3, 782)=3.47$, $p < 0.05$, partial eta=0.013, power=0.777. Post-Hoc tests of Scheffé showed significant differences between 9th and 12th grades on reappraisal scores and differences between the 9th and the 10th grades on suppression scores. As can be seen on the means presented in Table 3, the 9th grade adolescents presented higher means on the reappraisal strategy than did the 12th grade participants. They also presented higher means on the suppression strategy than did 10th grade participants.

In terms of satisfaction with life and self-esteem across gender and school grade, we only found significant differences between boys and girls regarding self-esteem, $t=-4.86$, $p < 0.001$. Boys revealed higher self-esteem levels than girls (Table 4). Besides, results showed significant differences across school grades concerning satisfaction with life, $F=2.67$, $p < 0.05$. However, Post-Hoc tests of Scheffé only presented marginally significant differences between 10th and 11th grades ($p < 0.10$), with 10th grade reporting higher levels of satisfaction with life.

4 Discussion

The present study validated the Portuguese version of the Emotion Regulation Questionnaire for Children and Adolescents (Gullone and Taffe 2012; ERQ-CA). Our results confirmed the original factor structure of the ERQ-CA, revealing a good fit for the total sample and considered subgroups (boys and girls; school grades). The orthogonal/independent model showed to be the best fit among different models tested, confirming that reappraisal and suppression are two independent emotion regulatory strategies that adolescents use differently across daily contexts and situations. This result is consistent

with the findings of previous studies with adolescent and adult samples (Balzarotti et al. 2010; Cabello et al. 2013; Gross and John 2003; Gullone and Taffe 2012; John and Gross 2004; Melka et al. 2011). This Portuguese questionnaire (QRE-CA) revealed an acceptable internal consistency for the reappraisal subscale. However, the suppression subscale was below the common minimum acceptable value of 0.70 (Kline 2000). This subscale has a low number of items, which according to Tavakol and Dennick (2011) can be one possible explanation for this kind of result. There is also the possibility that the suppression subscale is not so strong in this sample.

An important result was that invariance measurement tests provided evidence that boys and girls across different school grades interpret the QRE-CA similarly, conceptualizing reappraisal and suppression in the same manner, and thus validating group differences between gender and age (Gregorich 2006; Milfont and Fischer 2010).

We confirmed our initial hypothesis that higher levels of reappraisal were positively associated with dimensions of positive functioning such as self-esteem and life satisfaction. In turn, a greater use of suppression was associated with lower levels of self-esteem and life satisfaction. These results support the well-established conceptualization of reappraisal as an adaptive strategy and suppression as a non-adaptive strategy (Gross and John 2003; Gullone and Taffe 2012), by showing that these relationships also occur within a positive psychological framework in adolescence.

In addition to these general findings, a deeper analysis on gender and school grades highlighted new insights about the use of these two emotion regulation strategies. Concerning reappraisal, there was no gender differences on the use of this strategy, which is consistent with previous research with adolescents (Gullone and Taffe 2012) and adults (Balzarotti et al. 2010; Gross and John 2003). Nevertheless, a positive relationship occurred between reappraisal and higher levels of self-esteem and life satisfaction in girls. It seems that the use of this particular strategy assumes greater relevance when considering females' positive functioning.

Regarding suppression, and contrary to the prior, a gender difference exists, with boys using this strategy more frequently than girls. As expected and based on past research with children and adolescents (Gullone and Taffe 2012; Gullone et al. 2010), this finding suggests the existence of a specific gender difference on the use of suppression among adolescents similar to the one found within adult samples (Balzarotti et al. 2010; Cabello et al. 2013; Gross and John 2003; Melka et al. 2011). Researchers have recognized that emotions are embedded in social contexts and that culture itself influences and defines which emotions are appropriate and valid for specific gender and context and how they should be regulated (Haga et al. 2009). In this sense and according to Nezlek and Kuppens (2008), socializing processes and related emergent stereotype roles could explain gender differences on suppression and, specifically, the recognized lower emotional expressiveness in males.

According to this, and given the negative consequences associated to the use of suppression, we could expect that boys of the present study, when compared with girls, would present poorer positive functioning. Indeed, a greater use of suppression by boys was associated with lower self-esteem and life satisfaction, but they showed higher levels of self-esteem when compared to girls. These results seem to reinforce the role of gender on emotion regulation. Although these gender differences have not received much attention, we can highlight the study of Nezlek and Kuppens (2008). They evaluated the role of gender in the relationship between daily emotion regulation and

psychological adjustment and self-esteem within an adult sample. The authors found that the use of suppression had more negative consequences for women than did for men. Specifically, suppressing positive emotions was more strongly associated with decreases in adjustment and self-esteem in women when compared to men. The role of gender and positive functioning variables ask for a deeper analysis in order to find empirical evidence about their relation with emotion regulation strategies, besides social considerations. It is also important to consider other relationships pathways between these variables in adolescence.

Concerning age differences in the use of reappraisal and suppression, results showed that younger adolescents (9th grade) used more reappraisal and suppression than their older counterparts, as already evidenced by Gullone et al. (2010). Although these results suggest a greater use of these two strategies by younger adolescents, we underline the transversal design of our study that limits any conclusion about developmental patterns on emotional regulation processes.

Our results highlighted some important issues to consider on emotion regulation research in normative adolescents, such as gender, age, and relations with positive functioning variables. Being aware of the non-randomness of our sample, it is not possible to generalize our findings since the sample is not representative of the Portuguese adolescent population. Despite this limitation our study certainly opens new directions for future research.

Researchers should continue to work in the validation of this questionnaire using diverse and cross-cultural samples since different ethnicities and cultures may show specific patterns on the use of emotion self-regulation strategies (Southam-Gerow and Kendall 2002). On the other hand, to study other positive variables related to well-being besides self-esteem and life satisfaction is also a future research mainstream when analyzing the important role of emotion regulation in positive functioning. Since the ERQ-CA/QRE-CA only evaluates two specific emotion regulation strategies, other instruments should also be used in future studies. To extend this study to a wider age range of boys and girls will clarify the role of significant moderators that can influence emotion regulation processes. Specifically, it is important to analyze the way boys and girls differently use regulation strategies and why suppression is less used than reappraisal by both and in particular by girls. Longitudinal studies are a serious alternative to evaluate the existence of a pattern on the use of different regulatory strategies by gender and across different age periods through adolescence.

Future research should continue our findings and capture the richness and complexity of emotion regulatory processes and related strategies used by adolescents, shedding light on new factors, variables or predictors that can explain causal relations between emotion regulation and positive functioning of adolescents.

References

- American Psychological Association. (2010). Ethical principles of psychologists and code of conduct. Retrieved from <http://www.apa.org/ethics/code/index.aspx>
- 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. doi:10.1027/1015-5759/a000009.
- Bentler, P., & Bonnet, D. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin, 88*, 588–606.

- Black, D. S., Sussman, S., Johnson, C. A., & Milam, J. (2012). Psychometric assessment of the Mindful Attention Awareness Scale (MAAS) among Chinese adolescents. *Assessment, 19*(1), 42–52. doi:10.1177/1073191111415365.
- Bollen, K. A. (1989). *Structural equations with latent variables*. New York, NY: Wiley.
- Bordwine, V. C., & Huebner, E. S. (2010). The role of coping in mediating the relationship between positive affect and school satisfaction in adolescents. *Child Indicators Research, 3*, 349–366. doi:10.1007/s12187-010-9063-5.
- Brown, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136–162). Newbury Park, CA: Sage Publications.
- Byrne, B. M. (1989). *A primer of LISREL: Basic applications programming for confirmatory factor analytic models*. New York, NY: Springer.
- Byrne, B. M. (1994). Testing for the factorial validity, replication, and invariance of a measuring instrument: A paradigmatic application based on the Maslach burnout inventory. *Multivariate Behavioral Research, 29*(3), 289–311. doi:10.1207/s15327906mbr2903_5.
- Cabello, R., Salguero, J. M., Fernández-Berrocá, P., & Gross, J. (2013). A Spanish adaptation of the emotion regulation questionnaire. *European Journal of Psychological Assessment, 29*(4), 234–240. doi:10.1027/1015-5759/a000150.
- Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling, 9*(2), 233–255. doi:10.1207/S15328007SEM0902_5.
- DeCoster, J. (1998). *Overview of factor analysis*. Retrieved from <http://www.stat-help.com/factor.pdf>.
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment, 49*(1), 71–75. doi:10.1207/s15327752jpa4901_13.
- Foley, H. (2004). Counterbalancing. In M. Lewis-Beck, A. Bryman, & T. Liao (Eds.), *Encyclopedia of social science research methods* (pp. 206–207). Thousand Oaks, CA: SAGE Publications, Inc. doi: <http://dx.doi.org/10.4135/9781412950589.n180>
- Freire, T., & Tavares, D. (2011). Influência da autoestima, da regulação emocional e do género no bem-estar subjetivo e psicológico de adolescentes. *Revista de Psiquiatria Clínica, 38*(5), 184–188.
- Gilbert, K. (2012). The neglected role of positive emotion in adolescent psychopathology. *Clinical Psychology Review, 32*(6), 467–481. doi:10.1016/j.cpr.2012.05.005.
- Gliem, J. A., & Gliem, R. R. (2003, October). Calculating, interpreting, and reporting cronbach's alpha reliability coefficient for likert-type scales. Midwest Research-to-Practice Conference in Adult, Continuing, and Community Education, The Ohio State University, Columbus, OH. Retrieved from <https://scholarworks.iupui.edu/bitstream/handle/1805/344/Gliem%20&%20..?sequence=1>
- Gregorich, S. E. (2006). Do self-report instruments allow meaningful comparisons across diverse population groups? Testing measurement invariance using the confirmatory factor analysis framework. *Medical Care, 44*(Suppl 3), S78–S94. doi:10.1097/01.mlr.0000245454.12228.8f.
- Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology, 2* (3), 271–299. doi: 10.1037//1089-2680.2.3.271 DOI:10.1037/1089-2680.2.3.271
- Gross, J. J. (2002). Emotion regulation: Affective, cognitive, and social consequences. *Psychophysiology, 39*(3), 281–291. doi:10.1017/S0048577201393198.
- 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. doi: 10.1037/0022-3514.85.2.348.
- Gross, J. J., & Thompson, R. A. (2007). Emotion regulation: Conceptual foundations. In J. J. Gross (Ed.), *Handbook of emotion regulation* (pp. 3–24). New York, NY: Guilford Press.
- Gullone, E., & Taffe, J. (2012). The emotion regulation questionnaire for children and adolescents (ERQ-CA): A psychometric evaluation. *Psychological Assessment, 24*(2), 409–417. doi:10.1037/a0025777.
- Gullone, E., Hughes, E. K., King, N. J., & Tonge, B. (2010). The normative development of emotion regulation strategy use in children and adolescents: A two year follow-up study. *Journal of Child and Psychology and Psychiatry, 51*(5), 567–574. doi:10.1111/j.1469-7610.2009.02183.x.
- Haga, S. M., Kraft, P., & Corby, E. K. (2009). Emotion regulation: Antecedents and well-being outcomes of cognitive reappraisal and expressive suppression in cross-cultural samples. *Journal of Happiness Studies, 10*, 271–291. doi:10.1007/s10902-007-9080-3.
- Hortensius, L. (2012). *Project for introduction to multivariate statistics: Measurement invariance*. Retrieved from <http://www.tc.umn.edu/~horte005/docs/MeasurementInvariance.pdf>.
- Jaffe, M., Gullone, E., & Hughes, E. K. (2010). The roles of temperamental dispositions and perceived parenting behaviours in the use of two emotion regulation strategies in late childhood. *Journal of Applied Developmental Psychology, 31*(1), 47–59. doi:10.1016/j.appdev.2009.07.008.

- John, O. P., & Gross, J. J. (2004). Healthy and unhealthy emotion regulation: Personality processes, individual differences, and life span development. *Journal of Personality*, 72(6), 1301–1334. doi:10.1111/j.1467-6494.2004.00298.x.
- Jöreskog, K. G., & Sörbom, D. (1989). *LISREL 7: User's reference guide*. Mooresville, IN: Scientific Software.
- Jovanović, V. (2013). Evaluation of the Children's Hope Scale in Serbian adolescents: Dimensionality, measurement invariance across gender, convergent and incremental validity. *Child Indicators Research*, 6(4), 797–811. doi:10.1007/s12187-013-9195-5.
- Kline, P. (2000). *The handbook of psychology testing* (2nd ed.). London: Routledge.
- Kline, R. B. (2005). *Principles and practices of structural equation modeling* (2nd ed.). New York, NY: Guilford Press.
- Köse, A. (2014). The effect of missing data handling methods on goodness of fit indices in confirmatory factor analysis. *Educational Research and Reviews*, 9(8), 208–215. doi:10.5897/ERR2014.1709.
- Melka, S. E., Lancaster, S., 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.
- Milfont, T. L., & Fischer, R. (2010). Testing measurement invariance across groups: Applications in cross-cultural research. *International Journal of Psychological Research*, 3(1), 111–121.
- Morris, A. S., Silk, J. S., Steinberg, L., Myers, S. S., & Robinson, L. R. (2007). The role of the family context in the development of emotion regulation. *Social Development*, 16(2), 361–388. doi:10.1111/j.1467-9507.2007.00389.x.
- Neto, F. (1993). The satisfaction with life scale: psychometrics properties in an adolescent sample. *Journal of Youth and Adolescence*, 22(2), 125–34. doi:10.1007/BF01536648.
- Neumann, A., van Lier, P. A. C., Gratz, K. L., & Koot, H. M. (2010). Multidimensional assessment of emotion regulation difficulties in adolescents using the difficulties in emotion regulation scale. *Assessment*, 17(1), 138–149. doi:10.1177/1073191109349579.
- Nezlek, J. B., & Kuppens, P. (2008). Regulation positive and negative emotions in daily life. *Journal of Personality*, 76(3), 561–579. doi:10.1111/j.1467-6494.2008.00496.x.
- Nunnally, J. C. (1978). *Psychometric theory*. New York, NY: McGraw-Hill.
- Preacher, K. J. (2006). Quantifying parsimony in structural equation modeling. *Multivariate Behavioral Research*, 41(3), 227–259. doi:10.1207/s15327906mbr4103_1.
- Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, NJ: Princeton University Press.
- Rossee, Y., Oberski, D., Bymes, J., Vanbrabant, L., Savalei, V., Merkle, E., et al. (2013). *Package 'lavaan'*. Retrieved from <http://cran.r-project.org/web/packages/lavaan/lavaan.pdf>.
- Santos, P. J., & Maia, J. (2003). Análise factorial confirmatória e validação preliminar de uma versão portuguesa da escala de auto-estima de Rosenberg. *Psicologia: Teoria, Investigação e Prática*, 2, 253–268.
- Satorra, A., & Bentler, P. M. (1994). Corrections to test statistics and standard errors in covariance structure analysis. In A. Von Eye & C. C. Clogg (Eds.), *Latent variables analysis: Applications for developmental research* (pp. 399–419). Thousand Oaks, CA: Sage.
- Silk, J. S., Steinberg, L., & Morris, A. S. (2003). Adolescent's emotion regulation in daily life: Links to depressive symptoms and problem behavior. *Child Development*, 6(74), 1869–1880.
- Southam-Gerow, M. A., & Kendall, P. C. (2002). Emotion regulation and understanding Implications for child psychopathology and therapy. *Clinical Psychology Review*, 22(2), 189–222. doi:10.1016/S0272-7358(01)00087-3.
- Steinberg, L. (2005). Cognitive and affective development in adolescence. *Trends in Cognitive Sciences*, 9(2), 69–74. doi:10.1016/j.tics.2004.12.005.
- Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education*, 2, 53–55. doi:10.5116/ijme.4dfb.8dfd.
- Thompson, R. A. (2011). Emotion and emotion regulation: Two sides of the developing coin. *Emotion Review*, 3(1), 53–61. doi:10.1177/17540739110380969.
- Tweedy, K., & Lunardelli, A. (2001). *Multiple analysis of variance (MANOVA)*. Retrieved from <http://schatz.sju.edu/multivar/guide/Manova>.
- Westen, D., & Rosenthal, R. (2003). Quantifying construct validity: Two simple measures. *Journal of Personality and Social Psychology*, 84(3), 608–618. doi:10.1037/0022-3514.84.3.608.
- Zeman, J., Klimes-Dougan, B., Cassano, M., & Adrian, M. (2007). Measurement issues in emotion research with children and adolescents. *Clinical Psychology: Science and Practice*, 14(4), 377–401. doi:10.1111/j.1468-2850.2007.00098.x.