ORIGINAL PAPER

CrossMark

An integrative model of emotion regulation and associations with positive and negative affectivity across four Arabic speaking countries and the USA

Ahmed M. Megreya[1] · Robert D. Latzman[2] · Ahmed A. Al-Emadi[1] · Asma A. Al-Attiyah[1]

Abstract

The associations between emotion regulation (ER) and positive and negative affectivity have been well investigated. However, previous studies have examined these associations using a variety of individual ER scales with little integration across measurement approaches. The current study thus aimed to explore a joint ER structural model across three widely-used ER scales (the Emotion Regulation Questionnaire, the Regulatory Emotional Self-Efficacy Scale, and the Cognitive Emotion Regulation Questionnaire) using 1852 participants from four Middle Eastern Arabic speaking countries (Egypt, Kingdom of Saudi Arabia, Kuwait, and Qatar) and a Western country (USA). The results showed cross-culture differences with regard to mean-level differences and patterns of correlations among positive and negative affectivity and the individual subscales of the three ER scales. In addition, a two-factor integrative model that was robust across all five countries emerged across scales which included a more adaptive strategies factor and a less adaptive strategies factor. Further, the more adaptive strategies factor, but not the less adaptive strategies factor, yielded highly consistent associations with positive and negative affectivity across all countries. Accordingly, culture may play a more important role in shaping the less adaptive ER strategies and their associations with negative and positive affectivity, but less so for more positive strategies.

Keywords Emotion regulation · Positive and negative affectivity · Integrative model · Culture

Introduction

Emotion regulation (ER) is a core concept across various fields of psychological science that has a wide range of important consequences and implications in daily life (e.g., for a review see Gross 2015). ER can be defined as the processes or strategies that shape "which emotions one has, when one has them, and how one experiences or expresses these emotions" (Gross 1998). In service of capturing the nature and characteristics of these processes or strategies, a variety of ER models have been proposed along with companion assessment questionnaires including, potentially most notably, the two-process model (Gross 1998, 2001),

the regulatory emotional self-efficacy framework (Caprara and Gerbino 2001; Caprara et al. 2008), and the nine-factor model of cognitive regulation of emotions (Garnefski et al. 2001; Garnefski and Kraaij 2007). To date, however, there has been relatively little integration across these various models. The aim of the present study was to jointly investigate a common structural model of ER to allow integration across models and examine associations with positive and negative affectivity across four Arabic-speaking Middle Eastern countries (Egypt, Kingdom of Saudi Arabia, Kuwait and Qatar) and the United States of America (USA).

The two-process model describes two broad ER strategies: antecedent-versus response-focused strategies (Gross 1998, 2001). Antecedent-focused strategies refer to approaches people take before emotional responses have completely generated (including situation selection, situation modification, attentional deployment, and cognitive change). Response-focused strategies, on the other hand, refer to approaches people take after emotions have already been generated (including the modulation of experiential, behavioral, or physiological responses). Within this

✉ Ahmed M. Megreya
  amegreya@qu.edu.qa

1 Department of Psychological Sciences, College of Education, Qatar University, P.O. 2713, Doha, Qatar

2 Department of Psychology, Georgia State University, Atlanta, GA, USA

⚙ Springer

conceptual framework, Gross and John (2003) developed the Emotion Regulation Questionnaire (ERQ) to measure cognitive reappraisal (as an antecedent-focused strategy) and expressive suppression (as a response-focused strategy). Cognitive reappraisal refers to the interpretations of an emotion evoking event in a way that changes its emotional effects, whereas expressive suppression refers to the attempts of modulating emotional responses by inhibiting ongoing emotion–expressive behavior (Gross and John 2003). The ERQ has dominated the ER literature and has been translated into many different languages including Italian (Balzarotti et al. 2010), Spanish (Cabello et al. 2013), German (Abler and Kessler 2009; and also see Sala et al. 2012), Japanese (Matsumoto 2006), Turkish (Arens et al. 2012), and Chinese (Soto et al. 2011). Across these translations, the two-factor model of the original ERQ has been confirmed.

The Regulatory Emotional Self-Efficacy scale (RESE: Caprara and Gerbino 2001) assesses perceived self-efficacy in managing or expressing positive/negative emotions. According to Caprara and Gerbino (2001), self-efficacy in expressing/managing "positive" emotions (POS) refer to the belief in one's capability to express or experience a positive emotion in response to an accomplishment or pleasant event, whereas self-efficacy in managing "negative" affect (NEG) refers to the belief in one's capability to enhance a negative emotion in response to a hardship or frustrating event. A more recent study by Caprara et al. (2008) found that the self-efficacy in managing "negative" affect could be represented by two independent factors: despondency-distress (DES) and anger-irritation (ANG). The factor structure of the RESE has been confirmed across a variety of languages and cultures including Bolivia, Italy, USA (Caprara et al. 2008), and Turkey (Totan 2014).

The Cognitive Emotion Regulation Questionnaire (CERQ) was developed to distinguish between cognitive (e.g., making plans) and behavioral (e.g., taking immediate action) ER strategies (Garnefski et al. 2001). This questionnaire measures nine conceptually independent cognitive ER strategies. Specifically, these strategies include Self-blame (the thoughts of blaming oneself for what she/he has experienced), Acceptance (the thoughts of resigning what has happened), Rumination (thinking all the time on the feelings and thoughts associated with negative events), Positive Refocusing (thinking of other, pleasant matters instead of the actual event), Refocus on Planning (thinking on potential steps to deal with negative events), Positive Reappraisal (thinking of attaching a positive meaning to the event in terms of personal growth), Putting into Perspective (the thoughts of playing down the seriousness of a negative event as compared to other events), Catastrophizing (the explicit emphasize of the terror of negative events), and Other-blame (the thoughts of putting the blame for what one has experienced on others). The original Dutch language CERQ has been translated into

English (Garnefski et al. 2001) and the psychometric properties of the English language version have been shown to be adequate in the USA (Martin and Dahlen 2005). The English version of the CERQ has subsequently been translated into many different languages including French (Jermann et al. 2006), Chinese (Zhu et al. 2008), German (Loch et al. 2011; and also see Ehring et al. 2008), Roman (Perţe and Miclea 2011), Turkish (Tuna and Bozo 2012), Persian (Abdi et al. 2012), Italian (Cerutti et al. 2012), Spanish (Domínguez-Sánchez et al. 2013), Portuguese (Duarte et al. 2015), and Arabic (Megreya et al. 2016). All of these translations, with samples across various cultures, have confirmed the nine-factor model of the original CERQ.

Whereas empirical support exists for this nine-factor model, Garnefski et al. (2001) have shown that these factors can be understood within a broader two-factor model of ER strategies: the first has been termed more adaptive strategies and consists of Positive Refocusing, Positive Reappraisal, Putting into Perspective, Refocus on Planning, and Acceptance, while the second, termed less adaptive strategies, consists of Rumination, Self-Blame, Other-Blame, and Catastrophizing subscales. More recently, a similar two-factor structure has been found to adequately explain the 9 CERQ scales in a large sample of Arabic-speaking participants across four Middle Eastern countries (Megreya et al. 2016). Therefore, it appears that specific ER strategies, at least as assessed via the CERQ, can be subsumed within two latent factors.

In spite of the replicability of these various ER models across different countries and languages, evidence indicates that culture could shape ER strategies in quantitative and qualitative ways (e.g., for review see Ford and Mauss 2015; Mauss et al. 2008). For example, Matsumoto (2006) found that Americans had higher scores in cognitive reappraisal and lower levels of expressive suppression than the Japanese participants. In addition, using participants from 23 different countries, Matsumoto et al. (2008) found that the relationship between cognitive reappraisal and expressive suppression was positive for some countries (i.e., Hong Kong, India, Japan, Nigeria, and USA), negative for others (i.e., Mexico and Poland), and approaching zero for the others (i.e., Canada, China, Germany, and Russia). Accordingly, Matsumoto et al. (2008) suggested that cultures emphasizing the maintenance of social order (e.g., Japan) tend to have higher levels of expressive suppression, with a positive correlation between cognitive reappraisal and expressive suppression, whereas cultures minimizing this value (e.g., the USA) tend to have lower levels of expressive suppression, with a negative or zero correlation between these ER processes.

Furthermore, expressive suppression has been found to associate with high negative affect, high depression, low positive affect and high interpersonal functioning in several Western countries including the USA (Gross and John

2003), Italy (Balzarotti et al. 2010), Germany (Arens et al. 2012), and Spain (Cabello et al. 2013), but not in Eastern countries such as China (Soto et al. 2011). Indeed, individuals from Eastern interdependent cultures (i.e., Chinese), but not individuals from Western independent cultures (i.e., USA), tend to value emotional suppression to preserve interpersonal harmony (Wei et al. 2013). Conversely, a positive association between experiential avoidance and expressive suppression has been observed among European Americans, but not among Chinese participants (Su et al. 2014.). Therefore, Ford and Mauss (2015) concluded that culture shapes an individuals' motivation to regulate their emotions and, importantly, the adaptiveness of an ER strategy for their well-being.

The present study thus aimed to examine the joint factor structure across three widely-used ER questionnaires (ERQ, RESE, and CERQ) and its associations with positive and negative affectivity among participants from four Arabic speaking Middle Eastern countries (Egypt, Kingdom of Saudi Arabia, Kuwait and Qatar) and a Western country (USA). Specifically, we investigated the extent to which subscales from these three ER measures could be integrated within a two-factor model of ER and associations with negative and positive affectivity. Given previous findings of two broad factors emerging across ER questionnaires (e.g., Garnefski et al. 2001; Megreya et al. 2016), we expected an interpretable two-factor ER solution to emerge. Further, given previous findings that more adaptive ER strategies relate to higher positive affect while less adaptive ER strategies relate to higher negative affect (e.g., Domínguez-Sánchez et al. 2013; Gross and John 2003; Megreya et al. 2016), we expected that these two distinct ER strategies dimensions across the three ER questionnaires would yield different patterns of associations with positive and negative affectivity.

Method

Participants

A total of 1852 undergraduate university students ($M_{age} = 18.9 \pm 1.9$ years; 50.6% females) from five countries: Egypt (n = 355), Kingdom of Saudi Arabia (KSA) (n = 315), Kuwait (n = 400), Qatar (n = 400), and USA (n = 382) volunteered to participate in this study. Whereas American participants received course credit as compensation for participation, participants from the other countries received no compensation for participation. Table 1 describes the participants' ages and genders in each country. A two-way Chi-Square test showed no significant differences with regard to gender of across the five countries, $\chi^2 (4) = 1.156$, p = 0.29. The American participants were two-years older

Table 1 Summary statistics for the basic demographic variables of the participant samples in the five countries

Countries	N	Gender		M_{age} (SD)
		Females	Males	
Egypt	355	180	175	18.6 (1.4)
KSA	315	155	160	18.5 (0.9)
Kuwait	400	200	200	18.3 (1.6)
Qatar	400	200	200	18.9 (1.2)
USA	382	202	180	20.5 (4.5)

than participants from the four Arab countries; nonetheless, all participants, though, were in the same relative age group. For the four Arab countries, data were collected using identical procedures. The questionnaires were administered in groups in the students' classes using the original instructions of questionnaires, which were presented in hardcopies. All procedures were approved by Qatar University's institutional review board (QU-IRB), which required a written informed consent form from each participant. For the USA, participants accessed a secure website where they provided informed consent and completed all study questionnaires electronically through this site; study procedures were approved by Georgia State University's Institutional Review Board.

Measures

Emotion Regulation Questionnaire (*ERQ*: Gross and John 2003)

The ERQ is a 10-item self-report measure of two ER strategies: cognitive reappraisal (6 items) and expressive suppression (4 items), using a 7-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Gross and John (2003) reported moderate internal reliability rates using Cronbach's alpha for cognitive reappraisal (α = 0.79) and expressive suppression (α = 0.73), with no inter-correlation between these two sub-scales (r = − 0.01). In addition, the two-factor model of the ERQ was confirmed using a series of exploratory factor analyses (EFA) and confirmatory factor analyses (CFA) across four samples of American university student populations (Gross and John 2003).

Regulatory Emotional Self-Efficacy (RESE: Caprara and Gerbino 2001)

The RESE is 12-item self-report measure of the self-efficacy in expressing positive emotions (4 items) and the self-efficacy in regulating two independent negative emotions: despondency-distress (4 items) and anger-irritation (4 items), using a 5-point Likert-type scale ranging from

1 (*not well at all*) to 5 (*very well*). Caprara et al. (2008) confirmed the three-factor model of RESE using a series of EFA and CFA across three different samples from USA, Italy and Bolivia, and found that the three subscales positively correlated with each other (*r*s ranged between 0.13 and 0.63), with moderate to high internal reliabilities (αs ranged between 0.73 and 0.85).

Cognitive Emotion Regulation Questionnaire (CERQ: Garnefski et al. 2001)

The CERQ is a 36-item self-report measure of nine ER strategies (Self-blame, Acceptance, Rumination, Positive refocusing, Refocus on planning, Positive reappraisal, Putting into perspective, Catastrophizing, and Other-blame). Each subscale is measured by 4 items, using a 5-point Likert-type scale ranging from 1 (*almost never*) to 5 (*almost always*). Using a principal component analysis (PCA), Garnefski et al. (2001) supported this nine-factor structure of the CERQ and all subscales positively correlated with each other (*r*s ranged between 0.20 and 0.62), with moderate to high internal reliabilities (αs ranged between 0.68 and 0.83) and high test–retest reliability (*r*s ranged between 0.41 and 0.59) across subscales. In addition, a second-order PCA supported the two broader factors of the CERQ: the more adaptive strategies and the less adaptive strategies (Garnefski et al. 2001). These adequate psychometric properties were replicated using the Arabic version of the CERQ using samples from four Arab Speaking Middle Eastern countries (Megreya et al. 2016).

Positive and Negative Affectivity Schedule (PANAS: Watson et al. 1988)

The PANAS is a 20-item self-report measure of positive and negative affectivity. High positive affectivity (PA) represents a tendency to experience high energy, full concentration, and pleasurable engagement, whereas low PA is characterized by sadness and lethargy. In contrast, high negative affectivity (NA) reflects a variety of aversive mood states, whereas low NA is characterized by a tendency to experience calmness and serenity. Each PANAS item consists of a one adjective word describing a specific emotion. Half of the items describe ten positive emotions (i.e., interested, excited, strong, enthusiastic, alert, determined, inspired, attentive, active and proud) while the remaining half describe ten negative emotions (i.e., irritable, distressed, upset, guilty, scared, hostile, ashamed, nervous, jittery and afraid). Respondents are asked to indicate to what extent they have generally experienced the 20 emotional states using a 5-point Likert-type scale ranging from 1 (*very slightly or not at all*) to 5 (*extremely*). The two-factor model of the PANAS was supported using a series of PCA across a range of samples,

and the PA and NA factors had high reliability (αs = 0.88 and 0.87) and test–retest stability (*r*s = 0.68 and 0.71) (Watson et al. 1988).

Translations and procedures

The Arabic versions of the CERQ and the PANAS were used in a previous study (Megreya et al. 2016). The ERQ and RESE were translated from English into Arabic with permission granted from the first author of each questionnaire to the first author of the current study. Translations were done using similar procedures as those followed in previous studies (e.g., Megreya et al. 2016). Specifically, two independent translations were obtained for each instrument: one from the first author of this study (AMM) and the other from a professional translator who had no prior experience with each questionnaire. The translations of each questionnaire were then compared with each other and with the original English version to compile a final Arabic version. This committee translation method was generally considered as superior to the common back-translation method, which 'puts a premium on literal translation' (van de Vijver and Leung 1997, p. 39), whereby word-by-word translations rather than translations that capture the essence and the meaning of the items. All questionnaires were translated using Standard Arabic to avoid any possible differences in dialect across the four Arabic-speaking countries.

Statistical analyses

To examine cross-cultural differences among the five countries, a series of one-way between-participants Analysis of Variances (ANOVA) were performed across scales from the four questionnaires (ERQ, RESE, CERQ, and PANAS). To guard against Type II error (due to multiple comparisons), *F* values were considered significant if they were below 0.0001 (0.05/number of comparisons) and Tukey HSD was used for post-hoc comparisons. Effect sizes were examined using partial Eta Squared (η_p^2). In addition, Cronbach's alpha (α) was used to examine the internal reliability of the questionnaires across nations. Furthermore, Pearson's correlation coefficients were used to examine the associations among the four questionnaires. Finally, exploratory structural equation modeling (ESEM) was used to simultaneously consider higher-order ER dimensions assessed via scales from the various ER instruments and the association between these dimensions and negative and positive affectivity. ESEM is a relatively new modeling strategy allowing the integration of confirmatory and exploratory factor analytic techniques (Asparouhov and Muthén 2009). For the current set of analyses, conducted using the statistical software program Mplus 7.11 (Muthén and Muthén 1998–2013), we tested an ESEM model with 2 correlated exploratory factors extracted from

ER scales across subscales from the three ER instruments and then regressed these factors on manifest-level PANAS negative and positive affectivity scales; a maximum likelihood estimator was used when fitting these model. Five separate models were fitted for each of the five countries.

Results

Table 2 shows cross-cultural differences among the five nations in all ER subscales and positive and negative affectivity. Post-hoc comparisons showed that Americans had lower scores on Suppression, Rumination, Other-blame, and Negative Affect and higher levels of Self-efficacy in expressing/managing positive emotions when compared to participants in all of the four Arabic nations, all $qs \geq 3.9$, all $ps < 0.01$, all $\eta_p^2 \geq 0.17$. Table 3 show internal consistencies for all subscales for the five countries, all of which were with moderate to high (αs ranged between 0.66 and 0.92).

Table 4 shows the correlations among the four measures across all countries. To summarize, the subscales of the three ER questionnaires correlated with each other, with the exception of expressive suppression, which evidenced correlations with other ER subscales that were relatively

small or approached zero. The correlations between positive/negative affectivity and ER subscales were highly consistent across the four Arabic countries, but a different pattern of correlations was found for the USA, especially for the CERQ strategies. Specifically, across the Arabic countries, positive affectivity correlated positively with all of the CERQ strategies (except Catastrophizing and Other blame). In contrast, in the USA, positive affectivity correlated positively with the adaptive strategies (Positive Refocusing, Refocus on Planning, Positive Reappraisal, and Putting into Perspective) but did not correlate significantly, and often times at estimates approaching zero, with the less adaptive strategies (Self-blame, Acceptance, Rumination, Catastrophizing, and Other-blame). Conversely, across the Arabic countries, there were relatively small negative correlations between negative affectivity and all of the CERQ strategies (except Catastrophizing and Other blame). However, in the USA, negative affectivity correlated positively with the less adaptive CERQ strategies, but did not correlate significantly with the adaptive strategies.

Figure 1 shows ESEM results explaining observed PA and NA from ER EFA factors. Two clear ER factors emerged from the exploratory side of the ESEM. Specifically, as expected and consistent with previous findings (e.g., for a

Table 2 Cross-cultural differences among the five countries descriptive statistics for the ERQ, RESE, CERQ, and PANAS across the four Arabic countries and USA in this study

	Egypt M (SD)	KSA M (SD)	Kuwait M (SD)	Qatar M (SD)	USA M (SD)	F df (4, 1847)
ERQ						
Reappraisal	4.6 (1.2)	4.8 (1.2)	4.8 (1.1)	4.9 (1.2)	4.7 (1.3)	2.15
Suppression	4.3 (1.4)	4.4 (1.6)	4.2 (1.3)	4.2 (1.5)	3.8 (1.4)	9.29*
RESE						
POS	3.8 (0.8)	3.7 (0.8)	3.7 (0.8)	3.7 (0.9)	4.0 (0.9)	13.85*
DES	3.4 (0.8)	3.4 (1.0)	3.5 (0.8)	3.5 (0.8)	3.3 (0.9)	4.38
ANG	3.3 (0.8)	3.1 (0.9)	3.2 (0.8)	3.3 (0.9)	3.3 (1.0)	3.62
CERQ						
Self-blame	11.3 (3.4)	11.4 (3.5)	11.4 (3.1)	11.5 (3.3)	11.1 (3.6)	.81
Acceptance	12.9 (3.6)	13.8 (3.4)	12.7 (3.2)	12.9 (3.3)	12.8 (3.7)	5.58
Rumination	14.7 (3.5)	14.3 (3.6)	14.1 (3.4)	13.8 (3.5)	12.5 (3.8)	22.01*
Positive Refocusing	12.7 (3.6)	13.2 (4.2)	12.2 (3.5)	12.6 (3.8)	11.8 (4.0)	6.62
Refocus on Planning	14.9 (3.7)	15.5 (3.9)	14.6 (3.6)	14.9 (3.5)	14 (3.7)	7.78
Positive Reappraisal	14.9 (3.6)	14 (4.0)	14.3 (3.3)	14.6 (3.6)	14.3 (4.0)	2.80
Putting into Perspective	13.3 (3.5)	13.1 (3.8)	12.7 (3.2)	13.9 (3.5)	13.7 (3.7)	6.40
Catastrophizing	11.3 (3.9)	11.3 (4.3)	10.9 (3.7)	10.7 (3.6)	10.1 (3.7)	6.43
Other-blame	10.6 (3.4)	10.2 (3.5)	10.4 (3.1)	10.1 (3.1)	8.4 (3.4)	27.68*
PANAS						
Positive affect	36.4 (6.3)	35.2 (6)	35.4 (6.5)	35.8 (7.2)	34 (9)	5.80
Pegative affect	26.8 (7.3)	25.3 (7.7)	25.8 (7.7)	25.3 (7.6)	21.5 (8.8)	25.23*

To avoid the statistical type 2 error, concerning the multiple comparisons, *F* values were considered significant if they were below 0.0001

POS self-efficacy in expressing/managing positive emotions, *DES* self-efficacy in managing negative emotions: despondency/distress affects, *ANG* self-efficacy in managing negative emotions: anger/irritation affects

Table 3 Internal reliability (Cronbach's alpha) for the ERQ, RESE, CERQ, and PANAS across the four Arabic countries and the USA in this study

	Egypt	KSA	Kuwait	Qatar	USA
ERQ					
Reappraisal	.80	.75	.77	.85	.89
Suppression	.81	.85	.77	.85	.79
RESE					
Positive affect	.74	.71	.67	.77	.88
Despondency/distress affects	.72	.82	.67	.74	.85
Anger/irritation affects	.69	.76	.68	.78	.86
CERQ					
Self-blame	.69	.76	.70	.79	.79
Acceptance	.69	.73	.66	.72	.73
Rumination	.74	.84	.74	.80	.76
Positive Refocusing	.71	.84	.74	.80	.83
Refocus on Planning	.76	.86	.78	.77	.81
Positive Reappraisal	.76	.82	.69	.80	.85
Putting into Perspective	.69	.78	.67	.77	.77
Catastrophizing	.75	.81	.73	.78	.74
Other-blame	.74	.78	.72	.75	.78
PANAS					
Positive affect	.83	.81	.84	.85	.92
Negative affect	.80	.84	.84	.82	.92

meta-analysis see Aldao et al. 2010), a clear adaptive strategies factor and a clear less adaptive strategies factor emerged from the various ER subscales across CERQ, RESE, and ERQ scales. Further, whereas magnitude of loadings varied slightly, the patterns of loading for individual ER scales on each of the factors were extremely consistent across all countries with some minor exceptions. For example, whereas CERQ Putting into Perspective anchored the adaptive strategies factor for the Egyptian, KSA, Qatari, and USA samples, this scale did not load highly on this factor for the Kuwaiti sample.

Associations between ER dimensions and positive and negative affectivity were also relatively consistent across countries. The adaptive strategies factor evidenced a large positive association with PA across countries with standardized beta's (i.e., β) ranging from 0.689 (Egypt) to 0.577 (USA). Although consistently significantly negatively associated across countries, the magnitude of associations between this factor and NA were more variable with standardized beta's ranging from -0.589 (KSA) to -0.209 (USA). With regard to the less adaptive strategies ER factor, results were less consistent across countries. Specifically, the less adaptive strategies factor was found to only associate negatively with PA in the USA sample ($\beta = -.285$); PA was not associated with this factor in any of the Arabic-speaking samples ($Mdn\ \beta = .02$). With the exception of the

Qatari sample where no association emerged and the USA sample where a strong association emerged ($\beta = .56$), the less adaptive strategies factor evidenced a small yet still significant association with NA ($Mdn\ \beta$ across Egypt, KSA, and Kuwait $= .26$).

Discussion

Using ESEM to integrate scales across a variety of ER questionnaires into a single structural model, the current study examined associations between two ER factors that emerged across questionnaires (ERQ, RESE, and CERQ) and negative and positive affectivity. In addition, the replicability of these models was investigated across four Arab Speaking Middle Eastern countries (Egypt, Kingdom of Saudi Arabia, Kuwait, and Qatar) and a Western country (USA). Two clear ER factors emerged from these models: a more adaptive strategies factor and a less adaptive strategies factor (see Fig. 1). Across all of the five countries, there were highly consistent patterns of loadings for scales from the three ER questionnaires on each of these two factors. In addition, the associations between these two ER factors and positive and negative affectivity were highly consistent across all of the five countries, especially for the more adaptive strategies factor. However, a variety of cross-culture differences emerged with regard to mean-level differences and patterns of correlations among PANAS and ER questionnaires.

Examining the correlations between positive and negative affectivity and individual ER subscales showed an interesting contrast between the Arabic countries and the USA. For example, across the four Arabic countries, positive affectivity correlated positively with almost all of the ER subscales, regardless of whether they were adaptive or less adaptive ER strategies (see Table 4). Consistently, Megreya et al. (2016) reported strong positive correlations between positive affectivity and both the more and less adaptive CERQ subscales using four different samples of Arabic participants. On the other hand, in the USA, positive affectivity correlated positively with the adaptive ER subscales but did not correlate with the less adaptive ER subscales (see Table 4). Consistent with these findings, previous studies using Western participants have found that positive affectivity correlated positively with the more adaptive, but not with the less adaptive, CERQ strategies (e.g., Domínguez-Sánchez et al. 2013). Together, these results further support the suggestion made by Ford and Mauss (2015) that culture shapes the adaptiveness of ER strategies. For example, the adaptiveness of a specific ER strategy (such as suppression) regarding to an individual's well-being may vary across different cultures (e.g., see Su et al. 2014; Wei et al. 2013).

These cross-culture differences were also evident when mean-level differences were considered (see Table 1).

Table 4 The associations between the ERQ, RESE, CERQ, and PANAS, and across the four Arabic countries and the USA

	CERQ									ERQ		RESE		
	SB	Acc	Rum	Pref	Plan	PosR	Pers	Cat	Other	App	Supp	POS	NEG	ANG
PANAS														
PA														
Egypt	.30	.33	.31	.34	.48	.45	.28	.13	.11	.33	−.06	.47	.37	.48
KSA	.19	.20	.18	.33	.38	.42	.26	.04	.08	.35	−.15	.45	.41	.40
Kuwait	.20	.27	.25	.24	.33	.36	.34	−.01	.08	.34	−.17	.46	.47	.45
Qatar	.16	.29	.29	.34	.48	.48	.38	.11	.12	.38	−.30	.43	.43	.46
USA	−.06	.11	−.05	.30	.42	.45	.33	−.08	.01	.33	−.08	.51	.40	.43
NA														
Egypt	−.24	−.12	−.04	−.18	−.29	−.30	−.14	.09	.12	−.38	.12	−.27	−.22	−.28
KSA	−.08	−.24	−.10	−.30	−.27	−.38	−.24	.08	.09	−.32	.20	−.40	−.38	−.41
Kuwait	−.06	−.12	−.03	−.23	−.20	−.24	−.11	.15	−.02	−.27	.09	−.26	−.36	−.33
Qatar	−.13	−.23	−.15	−.34	−.41	−.37	−.31	.01	−.04	−.36	.23	−.34	−.39	−.39
USA	.37	.15	.29	.04	−.04	−.11	−.04	.44	.40	−.11	.20	−.18	−.25	−.21
RESE														
POS														
Egypt	.23	.21	.32	.22	.36	.31	.22	.07	.04	.33	−.13			
KSA	.11	.17	.22	.32	.29	.39	.28	.03	.01	.34	−.06			
Kuwait	.23	.29	.26	.23	.35	.37	.32	.06	.07	.41	−.10			
Qatar	.26	.34	.38	.29	.39	.34	.37	.07	.01	.45	−.17			
USA	−.02	.21	.10	.25	.38	.42	.36	−.04	−.09	.39	−.20			
Neg														
Egypt	.29	.20	.15	.24	.33	.33	.30	.11	.08	.25	−.02			
KSA	.08	.12	.12	.29	.30	.41	.26	−.08	−.01	.25	−.02			
Kuwait	.20	.27	.19	.28	.29	.30	.29	.07	.14	.40	.05			
Qatar	.22	.32	.25	.29	.37	.39	.36	−.02	.06	.40	−.03			
USA	−.20	.06	−.11	.25	.30	.35	.25	−.12	−.06	.32	−.08			
ANG														
Egypt	.20	.20	.13	.31	.29	.30	.31	.03	.09	.30	−.10			
KSA	.14	.16	.18	.22	.26	.34	.20	−.08	−.10	.30	−.08			
Kuwait	.11	.24	.14	.35	.35	.43	.30	−.01	.14	.45	−.01			
Qatar	.15	.17	.09	.23	.31	.34	.33	.01	.06	.27	−.10			
USA	−.09	.13	−.05	.23	.34	.38	.25	−.11	−.09	.33	−.04			
ERQ														
App														
Egypt	.24	.25	.26	.20	.37	.34	.25	.11	.03					
KSA	.22	.23	.28	.37	.33	.34	.32	.06	.10					
Kuwait	.18	.25	.26	.28	.26	.37	.29	.07	.08					
Qatar	.30	.37	.39	.41	.42	.42	.38	.02	.14					
USA	.09	.31	.17	.41	.52	.55	.46	−.08	−.12					
Supp														
Egypt	−.19	−.18	−.05	−.05	.03	−.01	−.08	−.05	.02					
KSA	−.04	−.06	−.17	−.04	.04	−.02	−.08	−.04	−.01					
Kuwait	−.14	−.09	−.24	.04	−.14	−.08	−.10	−.02	−.02					
Qatar	−.21	−.17	−.29	−.23	−.26	−.24	−.28	−.23	−.13					
USA	.17	.21	.23	.10	.06	.02	.10	.23	.22					

All *r* values ≥ .11 are significant at a .05 level

KSA Kingdom of Saudi Arabia, *Self* Self-blame, *Acc* Acceptance, *Rum* Rumination, *PRef* Positive Refocusing, *Plan* Refocus on Planning, *PosR* Positive Reappraisal, *Pers* Putting into Perspective, *Cat* catastrophizing, *Other* Other-blame, *PA* positive affect, *NA* negative affect, *POS* positive affect, *DES* despondency/distress affects, *ANG* anger/irritation affects, *App* reappraisal, *Supp* suppression
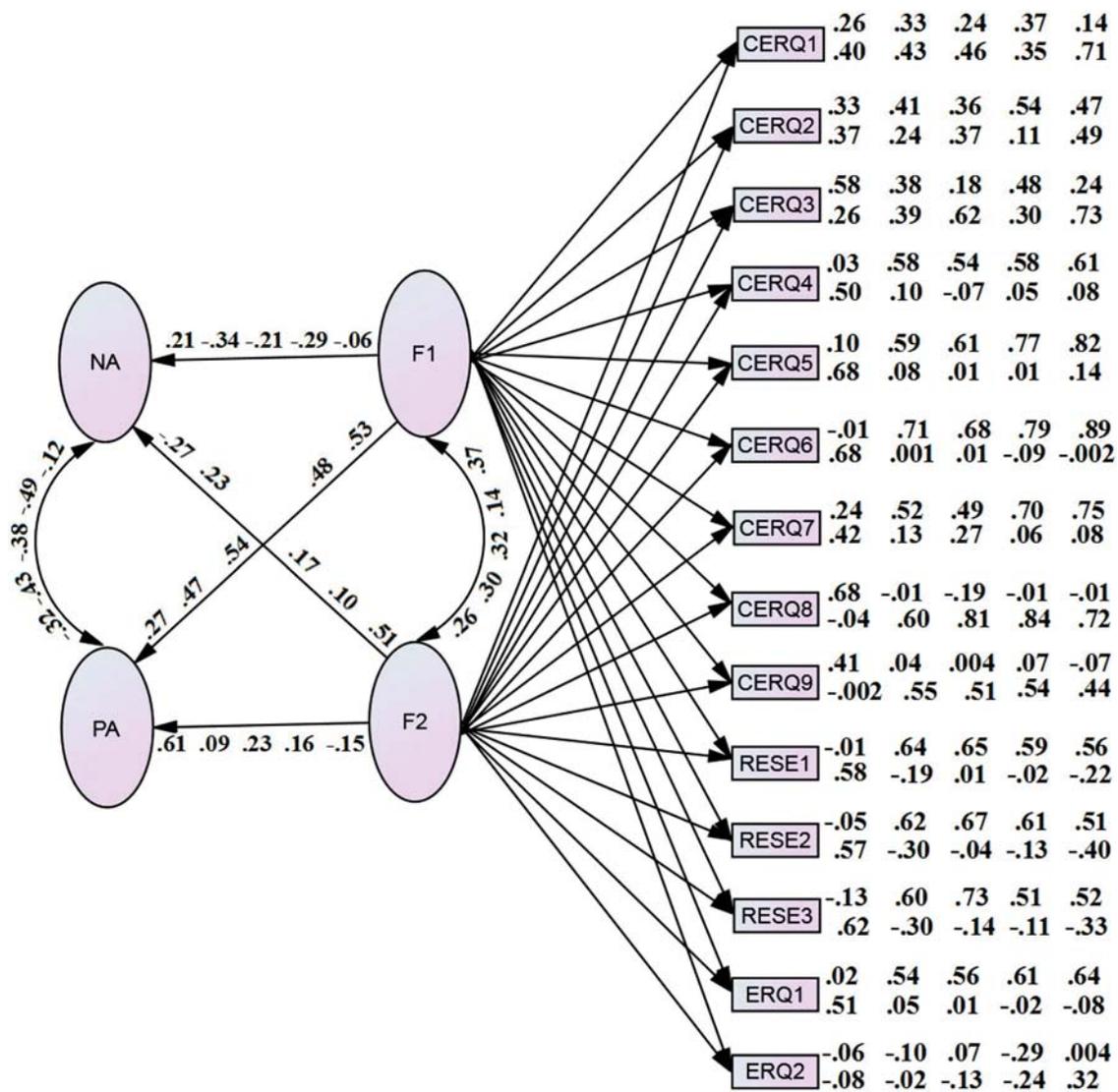
Fig. 1 Exploratory structural equation models explaining PA and NA from ER EFA factors. *NA* negative affect, *PA* positive affect, *CERQ* Cognitive Emotion Regulation Questionnaire, *CERQ1* Self-blame, *CERQ2* Acceptance, *CERQ3* Rumination, *CERQ4* Positive Refocusing, *CERQ5* Refocus on Planning, *CERQ6* Positive Reappraisal, *CERQ7* Putting into Perspective, *CERQ8* Catastrophizing, *CERQ9* Other-blame, *RESE* Regulatory Emotional Self-Efficacy Scale, *RESE1* managing positive affect, *RESE2* managing despondency/distress affects, *RESE3* managing anger/irritation affects, *ERQ* Emotion Regulation Questionnaire, *ERQ1* reappraisal, *ERQ2* suppression. All loadings represent Egypt, Kingdom of Saudi Arabia, Kuwait, Qatar and the USA (from left to right)

Specifically, Americans tended to have lower levels of expressive suppression, rumination, other-blame, and negative Affectivity and higher scores on self-efficacy in expressing/managing positive emotions, as compared with the samples in all of the four Arabic nations. Similar cross-culture differences were previously found between American and Asian participants (e.g., see Matsumoto 2006; Matsumoto et al. 2008). Therefore, Matsumoto et al. (2008) suggested that collectivistic cultures (which emphasize interdependence and in-group values as in the Middle East) tended to have higher scores on expressive suppression, while individualistic cultures (which emphasize independence and

in-individual values as in the USA) tended to have higher scores on cognitive reappraisal.

Consistent with previous findings (e.g., see Caprara and Gerbino 2001; Garnefski et al. 2001; Gross and John 2003), results of the current study suggest that a basic two-factor model of ER strategies is able to explain various ER strategies assessed across different questionnaires. Specifically, these two factors emerged as defining more adaptive strategies and less adaptive strategies. Importantly, these two ER factors were clear and robust, as they emerged across all of the five countries in this study. In fact, the distinction between adaptive and maladaptive ER strategies is common

in the ER literature (e.g., see Aldao et al. 2014; Conklin et al. 2015; Otterpohl et al. 2016). This distinction has an important implication for clinical psychology as the absence of adaptive ER strategies along with the presence of maladaptive ER strategies have been considered as important factors for internalizing and externalizing psychopathology (e.g., for a meta-analysis see Aldao et al. 2010).

With regard to associations between these two clear factors and positive and negative affectivity, our findings showed that the more adaptive strategies factor associated with positive affectivity positively and with negative affectivity negatively. Importantly, these associations were robust as they were consistently observed across all of the five countries (see Fig. 1). Associations between the less adaptive strategies factor and positive and negative affectivity were relatively less consistent across the five countries, however. Indeed, whereas the less adaptive strategies factor associated negatively with positive affectivity in the USA sample, it did not in any of the Arabic-speaking samples. In addition, although the less adaptive strategies factor associated positively with negative affectivity in the USA sample, with the exception of the Qatari sample, this factor evidenced small but significant positive associations with negative affectivity in all of the Arabic nations. Once again, these cross-culture differences in this integrative model support the conclusions that culture plays important roles in ER (e.g., for reviews see Ford and Mauss 2015; Mauss et al. 2008).

There are some limitations in the current study. First, the use of undergraduate samples might not be representative of community-dwelling adults potentially with a broader distribution of ER difficulties. Replication in more clinical samples as well as outside of the countries and cultures investigated in the current research is needed. However, using younger adults may be relevant for the aim of the present investigation as previous studies have found that this age group experiences greater ER difficulties as compared with middle-aged and older adults (Riediger and Klipker 2014). Second, associations between the more adaptive strategies factor and the less adaptive strategies factor and only broad dimensions of affectivity were examined. Future research should examine how these two clear ER factors link with psychopathology in general (e.g., see Aldao et al. 2010). Third, although the exploratory structural equation modeling (ESEM) approach was optimal for this study (as this was the first time these various ER subscales were considered within an integrative model and this was examined across four Arabic speaking countries and the USA), it is important for this integrative model to be confirmed using a more confirmatory framework (e.g., confirmatory factor analysis; CFA) in future studies. Finally, whereas we investigated three of the most commonly used measures of ER strategies, it will be important for future research to include additional assessments of ER strategies. Indeed, given the range of ER measures in the literature, it will be important to investigate the way in which other instruments fit within this two-factor ER strategies model and how this model associates with affectivity.

Conclusions

Despite these limitations, this is the first study to explore a joint ER structural model across questionnaires. Previous studies have individually investigated associations between positive and negative affectivity and the ERQ, RESE, and CERQ. The current integrative model confirmed that two clear and robust ER factors, a more adaptive strategies factor and a less adaptive strategies factor, are able to explain ER across four Middle Eastern Arab-speaking countries (Egypt, Kingdom of Saudi Arabia, Kuwait, and Qatar) and a Western country (the USA). Although the associations between the more adaptive strategies factor and positive and negative affectivity were highly consistent across all of the five countries, a less consistent pattern of association was found between the less adaptive strategies factor and positive and negative affectivity. Further cross-culture differences emerged with regard to mean-level differences and patterns of correlations among positive and negative affectivity and the individual subscales of the three ER questionnaires (ERQ, RESE, and CERQ). Therefore, we suggest that culture plays an important role in shaping the less adaptive ER strategies and their associations with negative and positive affectivity as compared with the more adaptive ER strategies. This suggestion needs further investigations in future studies.

References

Abdi, S., Taban, S., & Ghaemian, A. (2012). Cognitive emotion regulation questionnaire: Validity and reliability of the Persian translation of the CERQ (36-item). *Procedia-Social & Behavioral Sciences, 32*, 2–7.

Abler, B., & Kessler, H. (2009). Emotion Regulation Questionnaire: A German version of the ERQ by Gross and John. *Diagnostica, 55*, 144–152.

Aldao, A., Jazaieri, H., Goldin, P. R., & Gross, J. J. (2014). Adaptive and maladaptive emotion regulation strategies: Interactive effects during CBT for social anxiety disorder. *Journal of Anxiety Disorder, 28*, 382–389.

Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: A meta-analytic review. *Clinical Psychology Review, 30*, 217–237.

Arens, E. A., Balkir, N., & Barnow, S. (2012). Ethic variation in emotion regulation: Do cultural differences end where psychopathology begins? *Journal of Cross-Cultural Psychology, 44*, 335–351.

Asparouhov, T., & Muthén, B. (2009). Exploratory structural equation modeling. *Structural Equation Modeling, 16*, 397–438.

Balzarotti, S., John, O. P., & Gross, J. J. (2010). An Italian adaptation of the Emotion Regulation Questionnaire. *European Journal of Psychological Assessment, 26*, 61–67.

Cabello, R., Salguero, J., Fernández-Berrocal, P., & Gross, J. J. (2013). A Spanish adaptation of the Emotion Regulation Questionnaire. *European Journal of Psychological Assessment, 29*, 234–240.

Caprara, G. V., & Gerbino, M. (2001). Affective perceived self-efficacy: The capacity to regulate negative affect and to express positive affect. In G. V. Caprara (Ed.), *Self-efficacy assessment* (pp. 35–50). Trento: Edizioni Erickson.

Caprara, G. V., Giunta, L. D., Gerbino, M., Pastorelli, C., Tramontano, C., & Eisenberg, N. (2008). Assessing regulatory emotional self-efficacy in three countries. *Psychological Assessment, 20*, 227–237.

Cerutti, R., Presaghi, F., Gratz, K. L., & Manca, M. (2012). Deliberate self-harm behavior among Italian young adults: Correlations with clinical and nonclinical dimensions of personality. *American Journal of Orthopsychiatry, 82*, 298–308.

Conklin, L. R., Cassiello-Robbins, C., Brake, C. A., Sauer-Zavala, S., Farchione, T. J., Ciraulo, D. A., & Barlow, D. H. (2015). Relationships among adaptive and maladaptive emotion regulation strategies and psychopathology during the treatment of comorbid anxiety and alcohol use disorders. *Behaviour Research & Therapy, 73*, 124–130.

Domínguez-Sánchez, F. J., Lasa-Aristu, A., Amor, P. J., & Holgado-Tello, F. P. (2013). Psychometric properties of the Spanish version of the Cognitive Emotion Regulation Questionnaire. *Assessment, 20*, 253–261.

Duarte, A. C., Matos, A. P., & Marques, C. (2015). Cognitive emotion regulation strategies and depressive symptoms: Gender's moderating effect. *Procedia-Social & Behavioral Sciences, 165*, 275–283.

Ehring, T., Fischer, S., Schnülle, J., Bösterling, A., & Tuschen-Caffier, B. (2008). Characteristics of emotion regulation in recovered depressed versus never depressed individuals. *Personality & Individual Differences, 44*, 1574–1584.

Ford, B. Q., & Mauss, I. B. (2015). Culture and emotion regulation. *Current Opinion in Psychology, 3*, 1–5.

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.

Garnefski, N., Kraaij, V., & Spinhoven, P. (2001). Negative life events, cognitive emotion regulation and emotional problems. *Personality & Individual Differences, 30*, 1311–1327.

Gross, J. J. (1998). Antecedent- and response-focused emotion regulation: Divergent consequences for experience, expression, and physiology. *Journal of Personality & Social Psychology, 74*, 224–237.

Gross, J. J. (2001). Emotion regulation in adulthood: Timing is everything. *Current Directions in Psychological Science, 10*, 214–219.

Gross, J. J. (2015). Emotion regulation: Current status and future prospects. *Psychological Inquiry, 26*, 1–26.

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

Jermann, F., Van der Linden, M., d'Acremont, M., & Zermatten, A. (2006). Cognitive Emotion Regulation Questionnaire (CERQ): Confirmatory factor analyses and psychometric properties of the French translation. *European Journal of Psychological Assessment, 22*, 126–131.

Loch, N., Hiller, W., & Witthöft, M. (2011). The Cognitive Emotion Regulation Questionnaire (CERQ): Psychometric evaluation of a German adaptation. *Zeitschrift für Klinische Psychologie und Psychotherapie, 40*, 94–106.

Martin, R. C., & Dahlen, E. R. (2005). Cognitive emotion regulation in the prediction of depression, anxiety, stress, and anger. *Personality & Individual Differences, 39*, 1249–1260.

Matsumoto, D. (2006). Are cultural differences in emotion regulation mediated by personality traits? *Journal of Cross-Cultural Psychology, 37*, 421–437.

Matsumoto, D., Yoo, S. H., Nakagawa, S., et al (2008). Culture, emotion regulation, and adjustment. *Journal of Personality & Social Psychology, 94*, 925–937.

Mauss, I. B., Bunge, S. A., & Gross, J. J. (2008). Culture and automatic emotion regulation. In M. Vanderkerckhove, C. von Scheve, S. Ismer, S. Jung & S. Kronast (Eds.), *Regulating emotions: Culture, social necessity, and biological inheritance* (pp. 39–60). Oxford: Blackwell.

Megreya, A. M., Latzman, R. D., Al-Attiyah, A. A., & Alrashidi, M. (2016). The robustness of the nine-factor structure of the Cognitive Emotion Regulation Questionnaire across four Arabic speaking middle eastern countries. *Journal of Cross-Cultural Psychology, 47*, 875–890.

Muthén, L. K., & Muthén, B. O. (1998–2013). *Mplus user's guide* (7th edn.). Los Angeles: Muthén & Muthén.

Otterpohl, N., Schwinger, M., & Wild, E. (2016). Exploring the interplay of adaptive and maladaptive strategies: Prevalence and functionality of anger regulation profiles in early adolescence. *The Journal of Early Adolescence, 8*, 1042–1069.

Perțe, A., & Miclea, M. (2011). The standardization of the Cognitive Emotional Regulation Questionaire (CERQ) on Romanian population. *Cognition, Brain, Behavior: An Interdisciplinary Journal, 15*, 111–130.

Riediger, M., & Klipker, K. (2014). Emotion Regulation in Adolescence. In J. J. Gross (Ed.), *Handbook of emotion regulation* (2nd edn., pp. 187–202). New York: Guilford.

Sala, M. N., Molina, P., Abler, B., Kessler, H., Vanbrabant, L., & van de Schoot, R. (2012). Measurement invariance of the Emotion Regulation Questionnaire (ERQ): A cross-national validity study. *European Journal of Developmental Psychology, 9*, 751–757.

Soto, J. A., Perez, C. R., Kim, Y. H., Lee, E. A., & Minnick, M. R. (2011). Is expressive suppression always associated with poorer psychological functioning? A cross-cultural comparison between European Americans and Hong Kong Chinese. *Emotion, 11*, 1450–1455.

Su, J. C., Wei, M., & Tsai, H. T. (2014). Running away from unwanted feelings: Culture matters. *Cognition & Emotion, 28*, 1313–1327.

Totan, T. (2014). The regulatory emotional self-efficacy scale: Issues of reliability and validity within a Turkish sample group. *Psychological Thought, 7*, 144–155.

Tuna, E., & Bozo, Ö (2012). The Cognitive Emotion Regulation Questionnaire: Factor structure and psychometric properties of the Turkish version. *Journal of Psychopathology & Behavioral Assessment, 34*, 564–570.

van de Vijver, F. J. R., & Leung, K. (1997). Methods and data analysis of comparative research. In J. W. Berry, Y. H. Poortinga & J. Pandey (Eds.), *Handbook of cross-cultural psychology* (2nd edn., pp. 257–300). Boston, MA: Allyn & Bacon.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality & Social Psychology, 54*, 1063–1070.

Wei, M., Su, J. C., Carrera, S., Lin, S. P., & Yi, F. (2013). Suppression and interpersonal harmony: A cross-cultural comparison between Chinese and European Americans. *Journal of Counseling Psychology, 60*, 625–633.

Zhu, X., Auerbach, R. P., Yao, S., Abela, J. R. Z., Xiao, J., & Tong, X. (2008). Psychometric properties of the Cognitive Emotion Regulation Questionnaire: Chinese version. *Cognition & Emotion, 22*, 288–307.