



# Validating the emotion regulation questionnaire (ERQ) in Trinidad

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**Abstract**

**Objective:** This paper examined the psychometric properties of the Emotion Regulation Questionnaire (ERQ; Gross and John 2003) in an adult lifespan Trinidadian sample. Validity and reliability of the ERQ has been established in predominantly, White, European, developed countries, but never in a Caribbean under-developed country, like Trinidad.

**Method:** One hundred and ninety-one participants, aged 18 to 81 years-old, were recruited from university and community settings. As part of a larger study, participants filled out a demographics questionnaire, followed by the Positive and Negative Affect Schedule (PANAS), the ERQ, and the Big Five Inventory (BFI), which assess affective responding, emotion regulation, and personality, respectively.

**Results:** Confirmatory factor analysis was used and the two-factor structure of the ERQ was replicated (cognitive reappraisal and expressive suppression were the two subscales). The measure was reliable. Age, gender, personality, and affective responding were used to determine concurrent and discriminant validity. Age was the only variable that did not follow expected patterns. Older adults used suppression more often than expected.

**Conclusion:** The ERQ was determined to be a valid and reliable measure of emotion regulation for Trinidadians. However, sociohistorical circumstances may need to be considered when using the ERQ in Trinidad where suppression may be an adaptive emotion regulation strategy.

**Introduction**

**Validating the emotion regulation questionnaire (ERQ) in Trinidad**

Emotions are a culturally-uniform concept in the way they are experienced and expressed [1]. Emotion regulation is inherently linked to the way that we experience emotions – in fact, emotions are not experienced without some form of regulation of those emotions [2]. Emotion regulation is defined by Gross (1998a) as the way that, “individuals influence which emotions

they have, when they have them, and how they experience and express them” (p. 271). Over the course of the past ten years, the Emotion Regulation Questionnaire [3] has been validated and found reliable in the United States (US), China, Germany, Italy, Spain, United Kingdom (UK), Australia, and Sweden, among others [3-9]. The current study aims to assess the validity and reliability of the ERQ in a Trinidadian sample – a culture unlike many of the cultures listed above (i.e., multi-ethnic, and predominantly non-White/non-European). This will be accomplished by: (i) conducting a Confirmatory Factor Analysis (CFA)



of the ERQ, (ii) assessing the internal consistency of the ERQ and, (iii) examining the concurrent and discriminant validity of the ERQ as it relates to other constructs such as age, gender, personality, and affect.

### The emotion regulation process model

The ERQ was developed out of Gross' (1998) process model of emotion regulation. The process model is a basic input-output model that describes how emotion response tendencies (e.g., increases or decreases in emotion, [3] facial expressions, [10]; increases in heart rate [11]) are regulated from emotion cues (the input) to emotional responses (the output). Emotional regulation can occur before or after these emotional response tendencies have been produced. Two types of strategies— antecedent-focused and response-focused – can be employed to alter these emotional response tendencies. Antecedent-focused strategies are employed to change how one appraises a situation to alter its emotional significance by changing how one thinks [12]. The ERQ focuses on cognitive reappraisal, an antecedent-focused strategy, [2,13], which is the evaluating of a potentially emotion-stimulating situation in such a way that it changes its emotional impact [14]. It is considered a healthy emotion regulation strategy and is associated with positive affective (e.g., higher positive and lower negative emotion; [11]), cognitive (e.g., manage attentional resources more efficiently [15]; and social (e.g., high satisfaction in their social relationships [3];) consequences [16]. The ERQ also focuses on a response-focused strategy – expressive suppression which involves inhibition of emotional expressive behavior thereby changing the emotional impact of a situation [17]. It is considered a less healthy emotion regulation strategy [16]. Opposite to reappraisal, suppression is associated with negative affective (e.g., lower positive and higher or maintained negative emotion; [3], cognitive (e.g., poorer memory for auditory information; [12], and social (e.g., difficulty maintaining social relationships; [11,18]) consequences.

### Validation of a two independent factor model of the ERQ across cultures

Gross and John (2003) used both exploratory (EFA) and confirmatory (CFA) factor analyses to test the factor structure of the then brand new ERQ. Four samples consisting of 1483 undergraduate students were used to run an EFA and a CFA. The overall sample consisted of mainly European and Asian American students, with a small percentage of African and Hispanic Americans. The EFA revealed two factors. The CFA further tested if those two factors were related by testing four models – a general factor model (i.e., one factor), and three two-factor models: a hierarchical model (positing that there is a positive relation between reappraisal and suppression – in other words, that individuals regulate using both strategies a lot or neither strategy); a specialist model (positing that there is a negative relation between reappraisal and suppression – in other words, that individuals regulate preferring one strategy instead over the other); and an independence model (testing that the two factors did not correlate). The two-factor independence model provided the best fit of the data suggesting that the two strategies are not related – thus, an individual can use both strategies to varying degrees, and using one does not preclude the individual from using the other.

Since Gross and John's (2003) paper, a number of studies have validated the two-factor independent structure of the ERQ, in English-speaking (e.g., USA, UK, Australia), and non-

English-speaking countries (e.g., Italy, Spain) [19]. Moore and colleagues (2008) Conducted one of the first replication validation studies in the United States. They replicated the two-factor independence model even though their sample was very different to the original study (that is, they had a lifespan sample of only women who had suffered a traumatic event). Another US study [20] conducted a CFA on a sample of undergraduates and also found that a two factor uncorrelated solution best fit their data.

David M, et al. [8] conducted one of the most comprehensive validation studies of the ERQ to date – they conducted CFA and EFA on university student samples from 23 different countries from North America (USA, Canada), South America (Mexico, Brazil), Africa (Nigeria, Zimbabwe), Europe (e.g., Denmark, Germany, Greece, Russia), and Asia (e.g., China, Japan). The ERQ was translated in countries into the official language of the country in non-English speaking territories. Both CFA and EFA confirmed two factor solutions on the combined dataset (all 23 countries), as well as using multigroup analyses (i.e., per country). Validation studies have been conducted on other non-English speaking samples such as with the Italian [5], Spanish [6], German [4] and Swedish [7] versions of the ERQ. Independence models provided a good fit for the data for all samples, which consisted of undergraduate students, parents, and lifespan samples.

Finally, Spaapen and colleagues (2013) conducted CFA on two community lifespan samples in the UK and Australia. One item from the reappraisal scale needed to be dropped (“when I want to feel less negative emotion (such as sadness or anger), I change what I’m thinking about”) because modification indices showed that it covaried with another item (“when I want to feel more positive emotion (such as joy or amusement), I change what I’m thinking about”). The 9-item version of the ERQ showed a two-factor solution that fit the data. Thus, based on a review of the validation studies currently published on the ERQ, a two-factor independence model seems to provide the best fit for the ERQ in a variety of cultures. Further, reliability coefficients (Cronbach's alpha) across studies ranged from .75 to .86 for the reappraisal subscale, and from .68 to .83 for the suppression subscale. Thus, the ERQ seems to also be reliable across a variety of cultures.

### Concurrent and discriminant validity of the ERQ

Concurrent and discriminant validity of the ERQ is often assessed with variables such as: age, gender, personality, and affective responding. Some variables show consistent patterns of results in relation to reappraisal and suppression – for example, men have consistently been found to suppress more than women [3,9,21]. Age however, shows less consistent results across lifespan samples. For example, Moore and colleagues' (2008) and Spaapen and colleagues' (2013) validation studies found that age was not related to emotion regulation. However, other studies have shown that older adults use reappraisal more often than younger adults [16,22].

Two personality traits consistently show relations to reappraisal and suppression. Reappraisal is negatively related to neuroticism [3,5,6] and positively related to extraversion [5,6], whereas suppression is negatively related to extraversion [3,5,6] and positively related to neuroticism [5,6]. Though extraversion and neuroticism are the focus of most studies, other personality traits like agreeableness and openness to experience have been included in validation studies of the ERQ. Generally, these two traits show positive relations with reappraisal and negative rela-

tions with suppression. Conscientiousness usually shows mixed results in the literature with little or no relation to reappraisal and suppression [5,6].

Reappraisal and suppression are also related to positive and negative affect. Reappraisal is positively related to positive affect [3,5,6] and negatively related to negative affect [3,5,6,9], whereas suppression is negatively related to positive affect [3,5,6,9]. There are mixed results regarding suppression and negative affect: some studies find that suppression is positively related to negative affect [3,9] whereas others have found that there is no relation [5,6].

### The current study: Aims and hypotheses

The current study expects to add to the literature validating the ERQ with a sample of adults from a currently untested geographical region –the Caribbean. Trinidad and Tobago is the southernmost island in the Caribbean chain. It is described as a developed country by the Organization for Economic Cooperation and Development (OECD) since it was recently taken off the Development Assistance Committee (DAC) list of countries that were considered as qualifying for aid from larger donor countries (2011). However, some researchers [23,24] argue that by some social, rather than economic, indicators, it is still an underdeveloped country. For example, Trinidad has a relatively high crime rate [25], lower education [26], subjective health [27], and life expectancy levels compared with more developed countries [27]. The population of Trinidad is also unique compared to samples from other work validating the ERQ because it is comprised of generally non-White, non-European adults. Specifically, there is a need in the worldwide literature to address the gap between what is found in WEIRD versus non-WEIRD countries. WEIRD stands for Western, Educated, Industrialized, Rich and Democratic countries. A lot of research comes out of these geographic regions like the United States, Canada, and European countries like England, Germany, France etc. The research that is published from these countries are then mistakenly and often times interpreted as though all people behave this way when they really represent a subset of the world's population (see Henrich J, et al. 2010 [28] for a detailed review of this issue). Thus, we propose that more data needs to be published from countries that do not fall into this WEIRD categorization (like Trinidad and Tobago) in order to fully appreciate the cultural, social and economic variances that may account for differences in behaviour worldwide.

The current study aims to replicate the two-factor independence model in a Trinidadian lifespan sample. The current study will also test the reliability of the ERQ: the reappraisal and suppression subscales are expected to be internally consistent in Trinidad since internal consistency has been found in a variety of countries regardless of cultural differences [4-7]. Further, concurrent and discriminant validity will be assessed by examining associations with age, gender, personality, and affect. Specifically, concurrent validity will be demonstrated by a positive relation between reappraisal and age – older adults will score higher on reappraisal than younger adults [3]. Concurrent and discriminant validity will be demonstrated for suppression and gender – men are expected to suppress more than women; and men and women are expected to show no differences in their use of reappraisal [3,9,21]. Two personality traits (extraversion and neuroticism) are expected to demonstrate concurrent validity with reappraisal and suppression – a positive relation is expected between reappraisal and extraversion, and a nega-

tive relation is expected between suppression and extraversion. Conversely, neuroticism is expected to positively relate to suppression, and negatively relate to reappraisal. For reappraisal, a positive relation is also expected with agreeableness and openness to experience; and a negative relation is expected for suppression and both personality traits. Finally, for affective responding, concurrent and discriminant validity will be demonstrated with a positive relation between reappraisal and positive affect, and a negative relation between suppression and positive affect. Conversely, negative affect is expected to negatively relate to reappraisal. However, for suppression and negative affect, no specific relations are made since some studies have found that suppression is positively related to negative affect, whereas others have found no relation.

## Methods

### Participants

University ethics review board approval was received to conduct this study. A lifespan sample of 191 participants were recruited from Trinidad and ranged in age from 18 to 81 years old ( $M = 41.18$ ,  $SD = 18.96$ ).<sup>1</sup> Women comprised 55% of the sample. Consistent with the ethnic distribution of the population [29], 37% of the sample was Afro-Trinidadian, 37% Indo-Trinidadian, and 26% mixed Trinidadian. Participants were well educated with an average of 15.40 ( $SD = 4.37$ ) years of education and healthy. A subjective health question [30] asked participants to rate their health compared to others their age on a 6-point Likert scale ( $M = 4.98$ ,  $SD = .71$ ). Age was not related to subjective health but it was negatively related to education,  $r(191) = -.39$ ,  $p < .001$ . Men ( $M = 5.12$ ,  $SD = .71$ ) rated their subjective health higher than women ( $M = 4.87$ ,  $SD = .70$ ,  $r(191) = -.18$ ,  $p < .05$ ). Participants were recruited via email from an adult participant pool list, and list-serves for students and staff at a university. Psychology undergraduate student participants received partial credit towards a course requirement. All other participants received a stipend of TT \$100.00 for participating.

### Procedure and measures

Groups of two to ten participants were seated in a quiet, comfortable room. As part of a larger study, participants filled out a consent form, and demographics questionnaire, which asked about age, gender, education, and subjective health, for example. The Positive and Negative Affect Schedule (PANAS), the ERQ, and the Big Five Inventory (BFI), which assess affective responding, emotion regulation, and personality, respectively, were administered next. The full session lasted approximately 90 minutes although the questionnaires used for this part of the study only took approximately 40 minutes.

A description of the ERQ (the measure to be validated in a Trinidadian sample) is given first, followed by the PANAS and BFI, which were used to test the concurrent validity of the ERQ with affective responding and personality, respectively.

### Emotion Regulation Questionnaire (ERQ)

The ERQ [3] was developed to evaluate individual differences in the habitual use of two types of emotion regulation strategies: cognitive reappraisal and expressive suppression. The original ERQ consists of 10 questions and two subscales typically emerge in factor analyses. The reappraisal scale assesses antecedent focused strategies with six items. The suppression subscale assesses response focused strategies with four items. Table 1 gives each of the items that are on the ERQ, as well as

descriptive statistics for the items and subscales. Both subscales include questions about regulating positive and negative emotion. Responses are made on a 7-point Likert scale (1 is *strongly disagree*; 7 is *strongly agree*). The assessment of the validity and reliability of the ERQ in a Trinidadian sample are reported in the Results.

### Positive and Negative Affect Schedule (PANAS)

The PANAS [31] is a measure of affective responding by valence [32,33]. The PANAS consists of 20 words and phrases that describe different feelings and emotions. It is composed of two sub-scales with 10 items each. The positive subscale refers to a state of emotional well-being (e.g., excited, enthusiastic) and the negative subscale refers to a state of emotional distress (e.g., upset, ashamed). Responses are made on a 5-point Likert scale (1 is *very slightly or not at all*; 5 is *extremely*). Cronbach's alpha was .85 for the positive subscale and .85 for the negative subscale in the current study. One item on the negative subscale was dropped for the Trinidadian sample.<sup>2</sup>

### Big Five Inventory (BFI)

The BFI [34] is a 44-item scale that assesses personality traits and characteristics using the Big Five trait taxonomy. It is composed of five subscales preceded by the stem "I see myself as someone who...". The subscales include: extraversion (e.g., is outgoing, sociable); agreeableness (e.g., is considerate and kind to almost everyone); conscientiousness (e.g., does a thorough job); neuroticism (e.g., can be moody); and openness to experience (e.g., is original, comes up with new ideas). Responses are made on a 5-point Likert scale (1 is *disagree strongly*; 5 is *agree strongly*). Cronbach's alpha was .74 for extraversion, .71 for agreeableness, .76 for conscientiousness, .80 for neuroticism, and .78 for openness to experience in the current study. The BFI was modified for the Trinidadian sample.<sup>3</sup>

## Results

### Validity and reliability of the ERQ

Confirmatory Factor Analysis (CFA) was conducted using AMOS 21 [35]. CFA was chosen (instead of exploratory factor analyses) to test the validity of the ERQ in Trinidad because the ERQ is a widely used and tested measure of emotion regulation and has been found to be valid in a number of countries including Spain [6], France [5], Australia and the United Kingdom [9]. It has also been found to be internally consistent across lifespan samples, gender and ethnic groups [16,36,37].

The final independent, two-factor model is depicted in Figure 1. The model was over identified, that is, the number of free parameters was less than the number of data points<sup>4</sup>. Thus, the data was suitable for running a CFA. Two factors were specified: cognitive reappraisal and expressive suppression. The variance for each factor was set to 1.0 [38]. Each indicator was allowed to load on a single factor and the factors were not allowed to correlate based on previous research which indicated that the factors were unrelated [3,5,6]. Correlations were run between the two subscales in the current study to confirm independence: they were not related,  $r = -.07, p = ns^5$ .

The parameters were estimated using a maximum likelihood method [38]. The data was normally distributed for both factors: reappraisal skewness  $M = -.52, SE = .18$  and kurtosis  $M = .67, SE = .35$  and suppression skewness  $M = .27, SE = .18$  and kurtosis  $M = -.30, SE = .35^6$ . The model was evaluated using several goodness-of-fit indices including Chi-square (CMIN),

Chi-square/degrees of freedom ratio (CMIN/DF), Goodness-of-Fit Index (GFI), Root-Mean-Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), and Incremental Fit Index (IFI). CMIN and CMIN/DF are indicators of overall model fit. CMIN should be non-significant but is often times significant in large samples [39] and previous CFA papers examining the ERQ have reported significant CMINs [5,6,20]. CMIN/DF values less than three are favorable [40]. GFI and RMSEA are absolute fit indices. GFI values over .90 are acceptable. RMSEA values less than .05 indicate good fit but values up to .08 are considered acceptable [38]. CFI and IFI are based on a comparison between the hypothesized model and the null model which assumes that all items are unrelated with the factors. Values over .90 are adequate but values over .95 are considered to be a better fit [41,42].

The model was a good fit. Though the CMIN was significant, as expected given the sample size,  $\chi^2(35) = 64.84, p < .05$ , the CMIN/DF was 1.85 which is favorable and below the 3.0 criterion. The absolute fit indices demonstrated that the data fit the model well: GFI was .94 and the RMSEA was .07 thus falling below the upper-end of the acceptable .08 level. Both the CFI and IFI was .92, thus they were above the adequate value of .90 and approached the better fit value of .95. Thus, overall the two-factor independence model was considered an acceptable model based on the fit indices, which were also consistent with previous research [5,6,20].

The standardized regression values (i.e., loadings) from each item to the factors are shown in Figure 1. Each item loaded on the two factors, cognitive reappraisal and expressive suppression, as expected. There were six items loading on the cognitive reappraisal, and four items loading on expressive suppression factor. Factor loadings of .30 and over were considered to be minimally significant, and a factor loading of .40 was considered more favorable [43,44]. Stevens (2002) suggests that factor loading rules be based on sample size, where a loading of 0.38 is acceptable for a sample of 200. In the current study, there were two factors and all but one item loaded well on each intended factor. Five of the six items loaded acceptably well on the reappraisal scale at .37 and above, and four items loaded acceptably well on the suppression scale at .43 and above. Only one item fell below .30 (question five on the reappraisal scale loaded at .24. See Table 1 for the specific item.) Thus, analyses were re-run without this item but changes to the model fit and regression weights were negligible, thus, the item was retained<sup>7</sup>. Only one other item (question 1) fell below .40 but approached Stevens' (2002) value of acceptability at .37 with a sample size of 195.

Cronbach's alpha was used to determine the reliability of the subscales. Both subscales were found to be reliable: Cronbach's alpha was .70 for the reappraisal subscale and .70 for the suppression subscale in the current study. Thus, the ERQ appears to be measuring two distinct emotion regulation strategies, and is a reliable measure of emotion regulation in Trinidadian adults. Thus, the items for each subscale were averaged together to assess the concurrent and discriminant validity of the ERQ.

### Concurrent and discriminant validity

To test concurrent and discriminant validity of the ERQ, correlations were run between gender and age, and the reappraisal and suppression subscales, to see if patterns found in previous research [3,13,21,45-47] hold true in a Trinidadian sample. Also, the relation between the ERQ and the PANAS and

the BFI were examined to determine if patterns between reappraisal and suppression, and positive and negative affect [2,5,6] and personality traits [3,16,48,49] in previous research can be replicated in a Trinidadian sample. Though validity of scales is often times assessed with a multi-group CFA, sample size for particular groups was too low to run the analysis (sample sizes of 100 and above are recommended; [50,51]). Further, previous validation studies of the ERQ did not use this method, and chose to run correlations on gender and age. Thus, concurrent and discriminant validity was assessed by correlational analyses and by showing whether patterns that exist in previous work were found here [3,5,6]. Results of the correlational analyses in the current study are presented in Table 2, along with correlation values from other samples, for comparison.

### Cognitive reappraisal

The correlation between gender and reappraisal was non-significant  $r(192) = -.06, p > .05$ . This was an expected finding to show discriminant validity, and has been consistently found in the literature [3,21]. The correlation between age and reappraisal was also non-significant,  $r(191) = .01, p > .05$ . This was surprising because a positive relation between age and reappraisal is often used to demonstrate concurrent validity [16,22]. As expected and demonstrating concurrent validity, reappraisal was significantly related to positive and negative affect. Higher reappraisal scores were related to more positive affect and less negative affect [11]. Reappraisal also demonstrated concurrent validity with neuroticism: the two were negatively related. It was expected that reappraisal would also be positively related to extraversion [3,48] but findings were non-significant. However, reappraisal was positively related to two other positive personality traits: agreeableness and openness to experience (Table 2).

### Expressive suppression

Concurrent validity was demonstrated by relations between gender and suppression. Gender was significantly related to suppression,  $r(192) = -.16, p < .05$ . As expected [3,21], men used suppression more than women. Age was also significantly related to suppression,  $r(191) = .25, p = .001$ , though there was no expectation for age on this subscale. As age increased, suppression also increased. Suppression was not negatively related to positive affect though this was an expected finding to show concurrent validity [3,36]. Suppression was also not related to negative affect. This follows previous validation studies of the ERQ outside of the United States, which have also found non-significant relations between suppression and negative affect (Table 2) [5,6]. Thus, discriminant validity was demonstrated for suppression and negative affect. Suppression demonstrated concurrent validity with extraversion but not with neuroticism. As expected, suppression was negatively related to extraversion and openness to experience. However, suppression was expected to be positively related to neuroticism [3,48] but findings were non-significant. Suppression was also expected to be negatively related to agreeableness, however the relation was positive.

In summary, CFA demonstrated that the subscales of the ERQ in Trinidad are consistent with the valid independence model that is found for the measure in other cultures. Concurrent and discriminant validity was mostly confirmed. The pattern of relations for gender and negative affect demonstrated good concurrent and discriminant validity with the ERQ. The pattern of relations for positive affect and personality mostly

demonstrated concurrent validity with the ERQ. Age was the only variable that did not show good concurrent or discriminant validity with the ERQ – neither subscale followed expected patterns (no positive correlation between reappraisal and age, and no correlation between suppression and age). Thus, the ERQ was considered to be adequately valid in a Trinidadian sample. Finally, the ERQ was also found to be a reliable measure.

## Discussion

The current study tested the psychometric properties of the ERQ in three major ways: by testing the factor structure of the ERQ to determine if the two-factor independence model would be replicated and fit the data from a Trinidadian sample; by testing the reliability of the ERQ; and testing the concurrent and discriminant validity of the ERQ.

### Two independent, reliable emotion regulation factors in Trinidad

Confirmatory factor analysis revealed a two-factor independence model, which fit the Trinidadian sample adequately using a number of measures of best fit [38-40]. The two factors were reappraisal and suppression with six and four items each, respectively. Thus, Gross and John's (2003) CFA model was replicated in a Trinidadian sample though quite different samples were used. A large undergraduate sample was used in the seminal paper, whereas a multi-ethnic lifespan sample of undergraduates and community dwelling, non-White adults were used in Trinidad. Our sample also differs from previous validation studies, which used undergraduate students [8,20] or majority White/Caucasian/European samples [5,9,19]. A two-factor independence model has also been found in a variety of cultures outside of the United States [5,6,8]. Thus, it seems that there are two independent emotion regulation strategies measured by the ERQ, and this measure seems to be valid in a range of cultures worldwide. Only two validation studies of the ERQ are exceptions to this rule, at least to our knowledge – both are studies on community samples in Australia and the United Kingdom [9] and Germany [52]. Both studies settled on a modified version of the ERQ and a modified version of the independence model respectively.

Both subscales in the current study were also reliable. Previous validation studies, including the seminal paper, have all reported similar alpha levels for the reappraisal and suppression subscales as those found in the current study. Generally, alpha levels in previous studies ranged from .70 and above for both subscales [3,5,6,20]. Thus, the reappraisal and suppression subscales were found to be reliable in a Trinidadian sample as well.

Emotion regulation differs by individual difference variables (such as age, gender, and personality; [5,16,21,22]) and by consequence (such as affective responding; [3,6,9]). Thus, the variables with fairly consistent findings in the literature were chosen to demonstrate concurrent and discriminant validity with reappraisal and suppression in a Trinidadian sample. Previous patterns in the literature for gender, affective responding, and personality were mostly replicated and showed concurrent and discriminant validity which is discussed below. Whether the measure is valid across the lifespan is discussed in a separate section since these results were more complicated. Concurrent validity of each subscale is discussed below in more detail.

### Concurrent and discriminant validity of the cognitive reappraisal subscale

Cognitive reappraisal, or the extent to which a person re-evaluates a situation before emotionally responding [14], showed concurrent and discriminant validity in Trinidad since it mostly followed expected patterns in previous literature for gender, affective responding, and personality. For gender, there were no differences between men and women on reappraisal in the Trinidadian sample, thus showing discriminant validity since it is consistent with patterns previously found in the literature [3,21]. Reappraisal and its relation to affective responding also showed concurrent validity in Trinidad – as expected, rethinking an emotional situation was related to more positive and less negative affective responding. Thus, trends in previous literature from other countries [5,11,16] regarding reappraisal and its affective consequences seem to hold in Trinidad. We can therefore conclude that the reappraisal subscale of the ERQ seems to be a valid measure in Trinidad for men and women, and when considering affective consequences of emotion regulation.

The concurrent validity of the cognitive reappraisal subscale with personality, however, depends on the personality trait being examined in the respective culture. The subscale showed good concurrent validity with neuroticism: Trinidadians who are more neurotic were less likely to use reappraisal. This was expected since being able to regulate one's emotions by stepping back from them and re-evaluating them is something that is more common among individuals with positive personality traits [3,5,6]. That said, for extraversion, which is a positive personality trait, the relation was different to what is reported in the literature. Though a positive relation between extraversion and reappraisal was expected based on data from Italy and Spain [5,6] this relation was not found in the current study with a Trinidadian sample. However, other positive personality traits – agreeableness and openness to experience – were positively related to the use of reappraisal. Thus, even though we hypothesized about a relation to extraversion, using reappraisal more often was related to scoring high on other positive personality traits. Therefore, this still demonstrates that the construct of reappraisal is related to positive personality traits though the specific trait may differ depending on culture.

In sum, for reappraisal, gender, positive and negative affective responding, and the neuroticism results demonstrated good concurrent and discriminant validity in our Trinidadian sample. The only variable that did not follow an expected trend was extraversion. However, other positive personality traits like openness and agreeableness did show positive relations to reappraisal thus highlighting that positive personality traits coincide with using reappraisal more often.

#### **Concurrent and discriminant validity of the expressive suppression subscale**

Expressive suppression, or the extent to which an individual masks outward displays of emotion [17] also showed concurrent and discriminant validity, though some unexpected findings also emerged. The literature tends to find a consistent pattern between gender and expressive suppression [3,21] – men are more likely to regulate their emotions by not expressing them than are women. This same result was found with the current Trinidadian sample, thus demonstrating concurrent validity. According to Cabello and colleagues (2013), differences between men and women on suppression are consistently found across cultures because gender norms regarding minimization of negative emotions, such as sadness, tend to be consistent regardless of culture [3,53]. Aside from the consistent gender finding, there were two major groups of findings regarding the

validity of the suppression subscale in Trinidad. First, suppression showed good concurrent validity with negative affect, and extraversion and openness to experience (positive personality traits). Second, suppression did not show concurrent validity with positive affect and neuroticism.

Regarding the relation between suppression and negative affect, no specific hypothesis was made because of mixed findings in the previous literature [3,5,6,9]. However, if the literature is examined more closely the non-significant relation found in the current study between suppression and negative affect actually replicated findings in validation studies conducted in more collectivist cultures in Europe, such as Italy and Spain [5,6]. Although it is not known whether Trinidad is a collectivist culture, there are ethnic groups in Trinidad [54], like Indo-Trinidadians, who tend towards being collectivist. Indo-Trinidadians were introduced into the country through indentureship [55] and are descended from ancestors who were brought from countries like India which is a collectivist culture [56]. Therefore, following from previous studies that have validated the ERQ in collectivist cultures [5,6], the suppression subscale of the ERQ seems to be valid in Trinidad, in particular, in terms of showing discriminant validity with negative affect.

Another finding that demonstrated concurrent validity of the suppression subscale was that Trinidadians who were highly extraverted or highly open to experience did not hide their facial expressions and other outward signs of emotion. This finding follows previous patterns in validation studies worldwide [3,5,6]. Further, one of the key characteristics of an extravert, according to John and Srivastava (1999) is expressiveness. Thus, it is not surprising that there is a negative relation between extraversion and suppression (which entails reducing emotional expressivity). It seems, therefore, that if positive affective consequences (i.e., reduced negative affect) or positive personality traits (i.e., extraversion and openness to experience) are considered then the results are consistent, and good concurrent and discriminant validity seems to exist for the suppression subscale of the ERQ.

However, it seems that the opposite is true when negative affective consequences (i.e., reduced positive affect) and negative personality traits (i.e., neuroticism) are considered. Suppressing one's emotions is typically related to less positive affective responding [3,36]. However, in the current study there was no relation, which begs the question of whether the suppression subscale of the ERQ is valid for Trinidadians when negative affective consequences are considered. Furthermore, Trinidadians who were more neurotic did not use suppression more often even though a positive relation was expected. Though some studies have found no relation between neuroticism and suppression [3], other studies have found that there is a negative relation [5,6]. Further, there was a positive relation between individuals who were agreeable and hiding outward displays of emotion. Again, even though this was contrary to expected findings, it is not difficult to see how an individual who is socially adaptable, likeable, and compliant [34] may use a technique like suppression which hides outward signs of negative emotion in order to remain agreeable. Thus, there seems to be a trend in Trinidad that suppression is not linked to negative affective consequences.

In US and Western samples, suppression has deleterious or negative affective consequences because it is considered an unhealthy emotion regulation strategy: expression of emotions is a normative behavior in the West [3,36]. However, this may

not be true for all cultures, and particularly for those where suppressing emotions may have been a survival strategy historically. Trinidadians in this sample are descendants of African slaves or East Indian indentured laborers through colonization [57-60]. It is possible that learned behaviors on the plantations – for example, to suppress anger or other negative emotions in response to physical or verbal abuse from plantation owners [61] – may have been used, and passed down from generation to generation. This assertion is supported by a number of studies since parents are emotional coaches to their children, which influences their emotion regulation strategies [62-64].

Further, even Gross (2002) stated that suppression, in the right situation, may be adaptive. Thus, even today it might be likely that suppressing emotions in particular contexts and even cultures is still not considered an unhealthy emotion regulation strategy and thus produce little deleterious effects. In fact, the pattern of results overall for affect responding suggests that suppression is unrelated to affective responding. Thus, we believe that this subscale of the ERQ is measuring suppression for Trinidadians, but that affective responding and negative personality traits may not be adequate variables to demonstrate concurrent validity in this sample. This does not preclude future researchers, however, from further exploring these relations, or thinking about specific variables within a culture that might be able to validate the suppression subscale.

#### **Age and emotion regulation: A complicated relationship**

Age and emotion regulation did not relate to each other as expected in the Trinidadian sample. Although the majority of the literature finds that adults reappraise their emotions to a greater extent with increasing age [16,22], this was not found in the Trinidadian sample: there was no relation between age and reappraisal. Thus, at first glance, it may seem that cognitive reappraisal subscale of the ERQ is not valid for individuals at different ages across adulthood. However, if the literature is looked at closely, it seems that the relation between age and reappraisal depends upon the type of lifespan sample one uses. Spaapen and colleagues (2013), for example, also found no relation between age and using cognitive reappraisal as an emotion regulation strategy. Their sample, like ours, was not predominately university students. They had a lifespan, community sample. Our Trinidadian sample also consisted of a number of community-dwelling adults, particularly in the older adulthood range.

The current study also found that suppression increased with age. No studies have found, to our knowledge, that with increasing age, individuals are more likely to hide outward expressions of emotion than those who are younger. Thus, suppression or suppressive-like techniques may have been considered adaptive historically, and this may be particularly true for the older adults in the sample. After all, older adults (individuals ages 50 and over) in this sample have lived through major historical shifts in Trinidad. For example, Trinidad and Tobago became an independent nation in 1962 [65] and a republic in 1976 [66]. On average, older adults in the sample were 68 years old, making them teenagers when these changes occurred. Thus, suppression as an adaptive technique could be more valued by older adults who are therefore more likely to engage in these strategies than younger adults.

#### **Limitations and future directions**

One limitation of the current study that may have influenced

the relations between age and emotion regulation was the size and age distribution of the sample. There were 77, 65, and 50 participants in the young, middle-aged, and older adult age groups, respectively. The minimum recommended sample size per group is 100 participants if multi-group factor analysis is to be conducted [50,51]. To our knowledge, only one study [9] conducted a multi group analysis by age group (CFA results were consistent across age group but with a modified 9-item version of the ERQ). Thus, it is recommended that future studies use a larger sample so that a multi-group analysis can be conducted on age to determine if the factor structure of the ERQ will hold for young, middle aged and older adults. This will help researchers determine whether all three age groups interpret cognitive reappraisal and expressive suppression to mean the same thing (i.e., good fit in a multi-group factor analysis) but that the relations between these emotion regulation strategies and age just vary by culture and the type of sample (i.e., university, community lifespan) that is used.

Another limitation related to sample size is that the validity of the ERQ in the different ethnic groups in Trinidad (i.e., Afro-, Indo-, and Mixed-Trinidadians) could not be examined. Perhaps our speculation about collectivism in a culture (or sub-culture) would prove to be correct if each group was examined separately. For example, findings for negative affect in the current sample followed patterns in more collectivist cultures [5,6]. Thus, if Indo-Trinidadians are examined separately, it may be found that they are the ones driving this finding since this ethnic group may be more collectivist [56]. To our knowledge only one study has examined the factor structure of the ERQ by ethnic group in a US sample [20]. Thus, future validation studies of the ERQ should consider not only the validity of the measure in a culture, assessed as 'nation', but also consider assessing the validity of the ERQ within ethnic subsamples of a society.

Future studies should incorporate variables that measure the cognitive and social consequences of emotion regulation in order to further test the concurrent validity of the ERQ. Affective responding is only one consequence of emotion regulation; and though it is a good variable with which to demonstrate concurrent validity, there are also other major consequences that should be considered. Cognitive and social consequence variables are therefore suggested for future research. In particular, the cognitive and social consequences of expressive suppression need to be further examined especially since this strategy is more likely to produce detrimental effects in social situations [3,18], and carries with it a larger cognitive load [67]. Thus, variables like romantic relationship or peer relationship satisfaction, as well as feelings of inauthenticity can be included to test the concurrent validity of the ERQ with measures of social consequences. Similarly, tests of memory for cognitive load effects can be included as a test of concurrent validity of the ERQ with measures of cognitive consequence in future studies that validate the ERQ in Trinidad.

## Tables

**Table 1:** Descriptive statistics for items and subscales of the ERQ.

Item	M	SD
<i>Cognitive Reappraisal Subscale/ Alpha = .70</i>	5.04	1.03
Q1. When I want to feel more <i>positive</i> emotion (such as joy or amusement), I <i>change what I'm thinking about</i> .	5.05	1.74
Q3. When I want to feel less <i>negative</i> emotion (such as sadness or anger), I <i>change what I'm thinking about</i> .	4.83	1.78
Q5. When I'm faced with a stressful situation, I make myself <i>think about it</i> in a way that helps me stay calm.	5.06	1.70
Q7. When I want to feel more <i>positive</i> emotion, I <i>change the way I'm thinking</i> about the situation.	5.23	1.52
Q8. I control my emotions by <i>changing the way I think</i> about the situation I'm in.	5.06	1.49
Q10. When I want to feel less <i>negative</i> emotion, I <i>change the way I'm thinking</i> about the situation.	5.00	1.53
Total reappraisal	5.04	1.03
<i>Expressive Suppression Subscale/Alpha = .70</i>	3.46	1.30
Q2. I keep my emotions to myself.	3.95	1.77
Q4. When I am feeling <i>positive</i> emotions, I am careful not to express them.	2.83	1.87
Q6. I control my emotions by <i>not expressing them</i> .	3.48	1.82
Q9. When I am feeling <i>negative</i> emotions, I make sure not to express them.	3.60	1.69
Total Suppression	3.46	1.30

**Table 2:** Comparisons between the Trinidadian sample and international samples validating the ERQ in relation to other constructs.

	Reappraisal				Suppression			
	Trinidad (r)	USA (β)	Italy (r)	Spain (r)	Trinidad (r)	USA (β)	Italy (r)	Spain (r)
<i>Affect</i>								
Positive	.21**	.42*	.24**	.23**	-.01	-.33*	-.15**	-.14**
Negative	-.22**	-.51*	-.14**	.00	.05	.39*	.04	.05
<i>Personality</i>								
Neuroticism	-.21**	-.20*	-.23**	-.16**	-.01	.03	-.20**	-.12*
Extraversion	.11	.11*	.14**	.17**	-.31***	-.41*	-.32**	-.36**
Openness	.28***	.15*	.17***	.25**	-.18*	-.18*	-.16**	-.18**
Agreeableness	.31***	.14*	.11*	.20**	.17*	-.11*	-.18**	-.15**
Conscientiousness	.10	.13*	.11*	.07	-.10	-.14*	-.07	.06

Note. \* $p < .05$ , \*\* $p \leq .01$ , \*\*\* $p < .001$  [3,5,6]



Figure

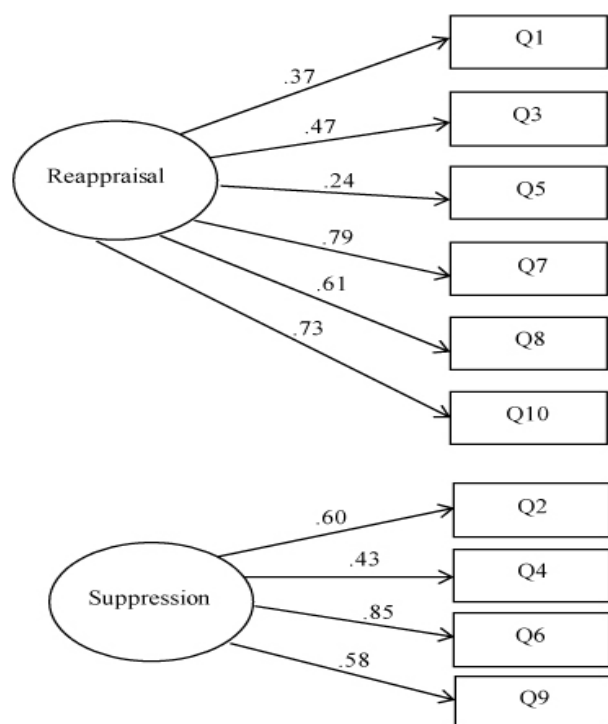


Figure 1: Model showing standardized regression weights.

## Conclusion

In conclusion, the ERQ should be considered a reliable measure of emotion regulation in Trinidad, as it has been in many other countries [3-7,9,20]. There are two distinct emotion regulation strategies being measured by the ERQ when it is used with Trinidadians – cognitive reappraisal and expressive suppression – just as there is in other parts of the world. The ERQ is also a valid measure. In future studies in Trinidad using the ERQ, gender, affective responding, and personality relations should be trustworthy. However, in studies that focus on lifespan samples, more work is needed to determine whether reappraisal and suppression mean the same thing in Trinidad as they do in other cultures. In general, we also suggest that further research needs to be conducted in lifespan samples from various cultures.

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## Footnotes

<sup>1</sup> Participants were not sampled from Tobago due to convenience and financial constraints.

<sup>2</sup> A modified version of the negative subscale of the PANAS for Trinidad was used based on exploratory factor analysis (EFA). See Ali (2014) for details of the dropped item and EFA statistics.

<sup>3</sup> A modified version of the BFI for Trinidad was used based on exploratory factor analysis (EFA). See Ali (2014) for details of dropped items and EFA statistics.

<sup>4</sup> The sample size was 191. Data points = 55, total parameters = 20; fixed parameters = 12; DF = 35

<sup>5</sup> To be thorough, CFA was run on a model allowing the factors to correlate, but the uncorrelated model in Figure 1 provided better fit

<sup>6</sup> Statistics are given in z-scores. None of the values were greater than 1.96, indicating a normal distribution.

<sup>7</sup>  $\chi^2(27) = 58.01, p < .05, CMIN/DF = 2.15, GFI = .94, RMSEA = .09, CFI = .91, IFI = .92$ , regression weights ranged from .38 to .80 for reappraisal and .43 to .85 for suppression. The item was also retained in an effort to keep the subscale intact and with as many items as possible to better represent the construct (Little, Lindenberger, & Nesselroade, 1999; Marsh, Hau, Balla, & Grayson, 1998).

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