

# **Measurement of Emotion Regulation in Children: Issues and Challenges**

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## **ABBREVIATIONS**

ADs: Anxiety Disorders

CER: Cognitive Emotion Regulation

CERQ: Cognitive Emotion Regulation Questionnaire

CERQ-k: Cognitive Emotion Regulation Questionnaire Kids Version

DASS: Depression, Anxiety, and Stress Scales

DERS: Difficulties in Emotion Regulation Strategies

ER: Emotion Regulation

ERC: Emotion Regulation Checklist

## INTRODUCTION

The ability to regulate emotions is pivotal to positive development in childhood. A considerable number of studies have shown that good emotion regulation (ER) skills are significantly linked with a variety of positive developmental tasks in childhood, such as higher levels of social competence (McDowell et al., 2002; Monopoli & Kingston, 2012), high-quality peer relationship (Graziano et al., 2007; Gülay Ogelman & Fetihi, 2019), higher academic achievement (Graziano et al., 2007; Gülay Ogelman & Fetihi, 2019), and greater resilience (Gülay Ogelman & Önder, 2019). Concurrently, some studies suggest an association between poorer ER in children and a range of psychological problems and difficulties, including internalizing and externalizing symptoms in general (Eisenberg, Cumberland, et al., 2001; Kim-Spoon et al., 2013; Kim & Cicchetti, 2010), and anxiety (Loevaas et al., 2018; Rydell et al., 2007), depression and behavioral problems specifically (Silk et al., 2003; Silva & Freire, 2014).

There has been a rise to date in studies investigating children's ER, including ER measurement in children. In the context of this review, author included her research about children's ER in two studies. The first article was a cross-sectional study investigating the relationship of mothers' characteristics (i.e., parental psychopathology and metacognitions) and mothers' parenting practices to children's nine specific CER strategies in a normative sample. A multidimensional measure of ER strategies is the Cognitive Emotion Regulation Questionnaire (CERQ; Garnefski et al., 2001) was used in this study. The study is among the first to examine these associations, because the existing evidence has primarily investigated the relationship between parental factors and a child's ER in general or one specific component of a child's CER in particular. The study included a sample of 153 mothers and their 8–12-year-old children. Correlation and hierarchical regression were used to analyze data. Results showed

that higher levels of anxiety in mothers were found to predict children's higher levels of rumination strategies. Additionally, mothers' lack of cognitive confidence predicted higher levels of catastrophizing in children, and approached significance in predicting children's self-blame. None of the investigated mothers' parenting practices, significantly predicted any of the children's CER strategies; however, mothers' anxious rearing approached significance in predicting children's refocus on planning, and mothers' control and overprotection approached significance in predicting children's positive reappraisal. Our findings extend family system research and demonstrate how maternal factors influenced specific CER in their school-age children.

The second article was a cross-sectional study that examined the influence of fathers' and mothers' cognitions—namely attitudes, beliefs, and understanding about child anxiety—on emotion dysregulation in children (Islamiah et al. 2023). The difficulties in emotion regulation scale short form (DERS-18) was used to assess children's typical levels of emotion dysregulation. Our study was the first to specifically investigate the relationship between parental cognitions about anxiety and ER in clinically anxious children. In total, 47 anxious children (6–17 years old) and their parents were involved in this study. The mothers and fathers completed the self-report questionnaire separately, assessing parental attitudes, beliefs, and understanding about their children's anxiety, while the children completed a self-report questionnaire assessing emotion dysregulation. The results indicated that only fathers' higher levels of unhelpful attitudes, beliefs, and understanding of anxiety were positively and significantly associated with greater ER difficulties in anxious children. Furthermore, fathers' unhelpful cognitions regarding anxiety uniquely predicted their children's ER difficulties. These findings highlight the importance of including fathers in preventive and therapeutic interventions in promoting ER abilities in children with ADs.

Based on her experience in the two studies assessing children's ER, the author found some issues measuring and challenges that important to be addressed. In addition, the author enhances the review by investigates these issues in the literature. Thereafter, the objective of this review to advance understanding of methodologies and ER measurement in children. Some suggestions will be discussed.

## **DEFINITION OF EMOTION REGULATION**

ER research has expanded rapidly in recent years (Hajcak et al., 2010) and become a popular topic in psychological literature (Cole et al., 2004; Gross & Thompson, 2007). One challenge to study ER is the lack of consensus in defining ER. It has been defined in various ways. Some researchers have conceptualized ER in general concept in terms of its outcomes rather than the process, so the quality of the ensuing emotions often characterizes ER. For example, Shields & Cicchetti (1997) defined ER as one's capacity to modulate emotional arousal. Here, ER is operationalized as individuals' differences in adjusting their emotional expression in terms of lability, flexibility and situational responsivity, to adapt to the environment (Shields & Cicchetti, 1997). Individuals might have a wide range of strengths and weaknesses in regulating their emotions. Good capacity in regulating emotions is often called good ER skills; in contrast, the inability to choose the appropriate emotional expression according to the environmental constraints is deemed poor ER skills, or emotion dysregulation.

The majority of researchers, however, have defined ER with greater emphasis on the process itself. Despite operationalizing ER by as general construct, researchers who underscored ER as a process operationalized ER as a discrete construct. In this context, Thomson's definition continues to be widely accepted (Zeman et al., 2006). He conceptualizes ER as "a series of intrinsic and extrinsic processes responsible for monitoring, evaluating and modifying emotional reactions, especially in its temporal elements and intensity for achieving personal goals" (Thompson, 1994, pp. 27–28). Moreover, other researchers define ER as

“behaviors, skills, and strategies, whether conscious or unconscious, automatic or effortful, that allow children to modulate, inhibit, or enhance emotional expressions and experiences” (Calkins & Hill, 2007, p. 229). Gross & Thompson (2007) specifically mentioned ER strategies as one of the core features of ER. He defines ER strategies as a particular process that is engaged in order to achieve one’s goal and the situational demands.

Specific ER strategies have been classified as adaptive or maladaptive based on their immediate impact on emotional states, behavior and cognitions (Aldao et al., 2010). Kraaij and Garnefski (2019) distinguished ER strategies into cognitive and behavior. Both play an important role for individuals in regulating their emotions when they experience stressful events. In addition, according to Garnefski et al. (2001), cognitive and behavior strategies should not be grouped in the same dimension, since thinking and acting are distinct processes that occur at different times.

Cognitive ER (CER), widely called CER strategy, has been defined as conscious, cognitive ways of processing the intake of emotionally stimulating information (Thompson, 1991) or emotions generated during or after having experienced an adverse event (Garnefski & Kraaij, 2018). There are varieties of CER strategies that people can use in regulating emotions, including adaptive and maladaptive strategies. Cognitive reappraisal, however, is a well-studied form of adaptive CER strategy, and it refers to an individual’s attempt to reframe a highly emotional situation to alter its meaning and emotional impact (Gross & John, 2003; Lazarus & Alfert, 1964). The newer studies from Garnefski et al. (2007) developed a multidimensional measure assessing nine specific cognitive strategies. The researchers categorized five of these into adaptive strategies: acceptance, putting into perspective, positive reappraisal, positive refocusing, and refocus on planning. The remaining four strategies fall into the category of maladaptive strategies: self-blame, other-blame, rumination, and

catastrophizing. Numerous studies have demonstrated that adaptive CER is an effective way of modifying emotional responses (see Ochsner et al., 2012, for a review).

In addition, behavioral components also play an important role in regulating emotions. In the context of ER, behavioral strategies are related to some specific actions to reduce emotion-arousing stimuli (Kraaij & Garnefski, 2019). Similar with CER, behavioral ER strategies are categorized into adaptive and maladaptive. The researchers mentioned three strategies as adaptive: actively approaching the stressful situation to deal with the problem, seeking social support, and seeking distraction to divert from negative feelings. Meanwhile, two strategies are classified as less adaptive: withdrawal and ignoring unpleasant situations.

## **CHILD EMOTION REGULATION MEASURES**

### **Difficulties in Emotion Regulation Scale: 18 items (DERS-18)**

The initial version of the Difficulties in Emotion Regulation Scale (DERS) was a 41-item self-report questionnaire which assessed individual difficulties in ER (Gratz & Roemer, 2004). The DERS is a popular measure to assess emotion dysregulation. It has been translated into several languages and adapted into several short forms, for example, DERS-SF (Kaufman et al., 2016), DERS-16 (Bjureberg et al., 2016) and DERS-18 (Victor & Klonsky, 2016). There are four aspects of ER that underpin DERS. The first is awareness and understanding of emotions. The second is acceptance of emotions. The third aspect is the ability to control impulses and behave in the presence of negative emotions, and final aspect is the ability to access ER strategies that are thought to be effective for making the individual feel better.

One example of ER measures is the short version of DERS-18 (Victor & Klonsky, 2016). The DERS-18 demonstrated good internal consistency and strong convergent and concurrent validity with the original DERS. In addition, the DERS-18 exhibited predictive



validity since greater ER difficulties assessed using this measure are associated with another self-reported tool assessing emotional experiences (Victor & Klonsky, 2016). According to Victor and Klonsky (2016), the DERS-18 internal consistency for an overall score was the alpha of .91. Subscales' Alpha reliabilities were .77, .83, .90, .88, .85, and .90, for awareness, clarity, goals, non-acceptance, strategies, and impulse, respectively.

The DERS-18 comprised three items per subscale, for six subscales as follows: 1) lack of awareness of emotional responses (e.g., "I am attentive to my feelings"), 2) lack of clarity of emotional responses (e.g., "I am confused about how I feel"), 3) difficulties engaging in goal-directed behavior when experiencing negative emotional responses (e.g., "When I'm upset, I have difficulty getting work done"), 4) non-acceptance of negative emotional responses (e.g., "when I am upset, I feel ashamed with myself for feeling that way"), 5) limited access to ER strategies perceived as effective (e.g., "when I am upset, I believe that I will remain that way for a long time"), and 6) difficulties controlling impulses when experiencing negative emotions (e.g., "when I am upset, I have difficulty controlling my behaviors"). Items are rated on a 5-point scale, from 1 = almost never to 5 = almost always, with higher scores indicating greater ER difficulties.

### **Cognitive Emotion Regulation Questionnaire: Kids Version (CERQ-k)**

The child version of the CER questionnaire (CERQ-k) is one of the few existing questionnaires assessing the conceptually different CER strategies that children may employ when facing stressful events (Garnefski et al., 2007). CERQ-k is a multidimensional measure assessing nine specific cognitive strategies, including adaptive and maladaptive strategies. Garnefski et al. (2007) categorized five of these into adaptive strategies: acceptance (resigning oneself to and accepting what happened); putting into perspective (diminishing the seriousness of an unpleasant experience); positive reappraisal (reflecting on the positive side of a negative

experience); positive refocusing (consciously focusing on good and pleasant situations rather than on the unpleasant experience); and refocus on planning (contemplating what to do in response to the adversity). The remaining four strategies fall into the category of maladaptive strategies: self-blame (taking responsibility for the negative events that have happened); other-blame (accusing others of what occurred); rumination (repeated thoughts and feelings connected to the negative experience); and catastrophizing (thoughts that overestimate the negative and terrifying aspects of an experience).

The CERQ-k is a 36-item questionnaire divided into nine conceptually unique subscales. Each subscale consists of four items. The scale employs a 5-point Likert scale ranging from 1 (almost never) to 5 (very frequently). Individual subscale scores are generated by adding the subscale scores for each CER strategy (from 4 to 20). Greater scores indicate greater use of the strategy. Garnefski et al. (2007) reported evidence that the CERQ-k has a strong convergent and concurrent validity with the original CERQ. Predictive validity was also confirmed by the positive association between CERQ-k and the reporting symptom of psychopathology. The scale has also shown sufficient to good internal consistency. Cronbach's alphas for the self-blame, acceptance, rumination, positive refocusing, refocus on planning, positive reappraisal, putting into perspective, catastrophizing, and other-blame were .79, .62, .73, .79, .75, .67, .68, .67, and .79, respectively (Garnefski et al., 2007). In our study, internal consistency figures for each CERQ-k subscale were .76 for self-blame, .63 for acceptance, .73 for rumination, .84 for positive refocusing, .70 for refocus on planning, .71 for positive reappraisal, .73 for putting into perspective, .54 for catastrophizing, and .75 for other-blame.

## **METHODS AND MEASUREMENT OF EMOTION REGULATION IN CHILDREN: ISSUES AND CHALLENGES**

In emotion research, selecting methods and measurements appropriately is crucial in evaluating children's ER. Some assumptions underpin the selection of ER measurement. One of these suggested selecting measurements is based on underlying theoretical perspectives. As the author described in the introduction, multiple definitions of ER exist. Consequently, it is paramount for researchers to specify which ER definitions they have chosen in their study to avoid misconceptions about other ER theoretical perspectives. For example, some researchers have examined ER as a global construct. This concept of ER uses general indexes to measure ER, such as higher versus lower ER ability. One measure of global ER that has received extensive attention in the literature is the Emotion Regulation Checklist (ERC; Shields & Cicchetti, 1997). The ERC consists of 24 items and is divided into two subscales. A higher ERC score indicates higher ER competencies. However, some researchers argue that using the general concept of ER does not capture individual patterns of ER (Bridges et al., 2004). Moreover, other researchers have assessed ER as a discrete construct, considering individuals' unique ways of regulating their emotions. A widely used multidimensional measure of ER strategies is the Cognitive Emotion Regulation Questionnaire (CERQ; Garnefski et al., 2001). This evaluates cognitive processes after an individual experiences a stressful event. The CERQ has 36 items with nine dimensions: acceptance, positive refocusing, refocus on planning, positive reappraisal, putting into perspective, catastrophizing, rumination, self-blame, and other-blame. Individual scores are generated by adding the sub dimension scores for each CER strategy. Greater scores indicate greater use of the strategy.

Concerning ER conceptualization, the current review discussed two different scales. One assessed children's ER strategies in a discrete construct, considering the need for more information about the individual uniqueness of how children regulate their emotions

cognitively. The CERQ-k questionnaire (Garnefski et al., 2007) was used to examine children's CER strategies following an adverse event. The scale has shown sufficient internal consistency. Another one examined children's ER difficulties using multidimensional of the DERS short form in a sample of clinically anxious children. Internal consistency for the overall scales was also good.

The author supported Bridges et al. (2004), who suggested using a comprehensively measuring ER scale. The author took benefits from the two scales (CERQ-k and DERS) in better-capturing ER. In the sample of clinical children, assessing ER using DERS depicted ER difficulties in awareness, understanding, and acceptance of emotions and an ability to control emotions. However, this scale provides less information about the ER process, for instance, how children think and behave while or after experiencing a stressful event. Learning ineffective strategies (cognitive and behavioral) used by children with mental disorders would help clinicians design therapeutic intervention programs. Study 1 conducted by the author assessed only CER strategies using CERQ-k in a normative sample. Future studies should assess both cognitive and behavioral ER strategies, especially when examining ER in clinical samples. For example, using both CERQ-k and The Early Emotion Regulation Questionnaire (Perry & Dollar, 2021) or using a recent measure of cognitive and behavioral ER strategies developed by Zhou et al. (2020).

In terms of methodology, there are four approaches that researchers primarily use to assess ER in children: self-report, other-informant report, observations, and neurophysiological assessment. Each of these methods comes with its own set of strengths and weaknesses. First, self-report methodology is beneficial for accessing children's information about their own emotions (Adrian et al., 2011), as well as accessing their motivational changes and action tendencies (Zeman et al., 2006). Self-report ER data can be collected by self-report questionnaires, such as the emotion regulation questionnaire (Gross & John, 2003), or

interview methods that allow researchers to gather ER information from the child through questioning in a structured, semi-structured, or open-ended format. For instance, the child and adolescent meta-emotion interview (Katz & Windecker-Nelson, 2002) assesses children's experiences, thoughts, and feelings about anger and sadness through 16 open-ended questions. According to Adrian et al. (2011), most researchers use self-report methods to measure ER in middle childhood and adolescence. Two sample of ER measures in the current review collected ER data via child self-report using a questionnaire. This method was chosen considering that the author collected the data via online surveys. The children completed online self-report questionnaires at home. In this context, self-report questionnaires offer the greatest pragmatic advantages compared to other measurement techniques, such as observational or physiological techniques. The author can access the children's ER from their own perspectives, feelings, and experiences. However, the author recognized several limitations in measuring ER using the self-report method. First, this method requires the child to have certain cognitive levels to be aware of their emotions. The samples of two studies in the current review consisted of children and adolescents aged 6 to 17 years old. The author argued that the ER self-report questionnaire is best suited to children over 8 years old. Asking children younger than 8 years old to rate their own ER by completing a questionnaire might be too soon. The interview method would benefit these younger children. Other issues using self-report questionnaires include biases, context effects, and poor memory. For instance, in the CERQ-k questionnaire, children are asked to remember one stressful life experience and rate their CER strategies following the stressful situation. Although the instruction is clearly written in the questionnaire, there is still space for children to misinterpret the context, or not remember their last stressful event very well. These particular issues may lead to inaccuracies.

Second, the other-informant method examines children's ER by asking for information from individuals who have interacted with the child daily in a variety of settings, for example,

parents, siblings, grandparents, teachers, and friends (Zeman et al., 2006). The other-informant data, such as the parents' report, is informative and convenient for understanding ER in a home setting. However, older children spend most of their productive time at school. Therefore, a teacher's report could be valuable because it provides an opportunity to understand children's ER in a school setting, which is not accessible for parents (Adrian et al., 2011). Nonetheless, validated measures for other informants have been limited to parents to date, with few existing validated measures that assess the siblings', extended family's, teachers', and friends' perceptions of children's ER (Zeman et al., 2006). The studies in the current review did not use an other-informant method in assessing children's ER. Hence, if the author had used other informants, such as mothers and fathers, the author may have better captured children's ER from different angles. A multi-informant method may yield disparate ER reports in the same children (De Los Reyes & Kazdin, 2004). Indeed, these discrepancies might be useful for a better understanding of child ER.

Third, observation methods are often considered better than self-report in developmental research (Cummings et al., 2000). These methods assess ER through facial expressions, body gestures, or voice tones. Researchers have used observation methods more frequently to measure ER in infancy and toddlers. For instance, Tonyan (2005) naturalistic observation assessed infants' ER based on the interaction between mother and child. The researcher videotaped 30 minutes of unstructured mother-child interactions and then coded them for the ER from distress vocalizations. Nevertheless, this particular method only captures limited components of ER and misses unobservable processes (Adrian et al., 2011). Since the data in the current review was collected via online surveys, observations were not possible. Future studies should consider using observation methods if the researcher intends to assess ER, especially at a younger age population.

Finally, neurophysiological methods acknowledge internal biological mechanisms in ER processing, such as those in the brain and spinal cord. These mechanisms are unconscious and only observable by specific measures such as electroencephalogram and neuroimaging techniques. Research in ER using this technique is scarce. Future research would benefit from investigating neurophysiological methods alongside other methodologies that have been established previously.

A 35-year review of ER assessment in children by Adrian et al. (2011) revealed that most studies in the area relied on one methodology (61.1%), 23.6% used two methods, and 10.8% used three. Only 4.5% used an impressive four methods. Two studies in this review collected ER data via a single method, i.e., child self-report in children aged between 6 and 17 years old. The self-report method used in this review was chosen to follow the practices of most other researchers in the field who assess ER in children and adolescents. However, the single method used in the current review is likely to suffer from limitations. According to Thompson (1994), ER is a multicomponent process. Therefore, Adrian et al.'s (2011) findings indicated the need for ER research using a multimethod approach to evaluate ER in children. Future studies should use more than one method to capture ER comprehensively, for instance, asking the children, parents, and teachers to complete a questionnaire to assess school-age children's ER, or employing neurophysiological methods combined with a parental report questionnaire to assess infants' ER.

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