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Evaluation of the psychometric properties of the Emotion Regulation scale

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Evaluation of the psychometric properties of the Emotion Regulation Scale

Bebhinn Timmins

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JAMES MADISON UNIVERSITY

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Abstract

Attention Deficit Hyperactivity Disorder (ADHD) is the most common childhood disorder effecting 3-7% of school aged children and accounting for 30-50% of mental health referrals. Recent research in the area of emotional regulation has found that youth with ADHD have more difficulty regulating emotion than youth without ADHD. This is unfortunate, as emotional dysregulation has been linked to psychopathology, poor social functioning, substance abuse and suicide. Given this information, it is extremely important that measurement of emotion regulation is adequate because without good measurement it is impossible to improve our understanding of how emotional regulation is developed, maintained and how it can be treated. Therefore, it is important that we have an ability to assess emotional regulation within the ADHD population. Currently, some measures do exist to evaluate emotional regulation. However, none have been validated for use with the ADHD population. Disagreement among researchers in the working definition of the theoretical construct and lack of emotion regulation measures has stifled progress in this field. One test that has been developed that may serve as a useful measure for research focused on intervention development is the Emotional Regulation Scale.

The current study explores the psychometric properties of the Emotional Regulation Scale within a sample of youth with ADHD. Results provide preliminary reliability and validity evidence in support of the instrument. In addition, the social subscale of the scale seems to play a particularly important role with this population. Implications of these findings and recommendations for future research in this area of study are included.

Introduction

Attention Deficit Hyperactivity Disorder (ADHD) is the most common childhood disorder effecting 3-7% of school aged children and accounting for 30-50% of mental health referrals. Recent research in the area of emotional regulation has found that youth with ADHD have more difficulty regulating emotion than youth without ADHD. This is unfortunate, as emotional dysregulation has been linked to psychopathology, poor social functioning, substance abuse and suicide. Given this information, research is warranted in the area of intervention development. In order to proceed with this research it is extremely important that measurement of emotion regulation is adequate because without good measurement it is impossible to improve our understanding of how emotional regulation is developed, maintained and how it can be treated. Currently, some measures do exist to evaluate emotional regulation. However, none that focuses on skill set and none that have been validated for use with the ADHD population. Disagreement among researchers in the working definition of emotion regulation and lack of emotion regulation measures has stifled progress in this field, but one test that has been developed that may serve as a useful measure for research is the Emotional Regulation Scale.

Emotion Regulation is Important to Functioning Well

Emotion regulation (ER) is a capacity that developmental literature reports to be acquired over the first years of life along with motor skills, attention and cognition. Like other such skills it is then influenced by extrinsic factors such as caregiver response to emotional expression. During infancy, emotional regulation plays a pivotal role in a child's ability to engage in adaptive social behavior. However, when these skills are not

acquired or properly developed, impairment in multiple domains of functioning may result.

Research on emotional regulation in the general population has suggested that it is imperative to healthy psychosocial functioning in adulthood. Researchers seeking to determine factors that contributed to healthy psychosocial functioning of adults conducted a longitudinal study assessing multiple constructs (Pulkkinen, Nygren, & Kokko, 2002). The study used performance on a frustrating task to measure emotional regulation. During the task, constructive (*Tries to act reasonable even in annoying situations, thinks that if one negotiates everything will be better and sides with smaller and weaker opponents*) and compliant (*is peaceable and patient, dislikes squabbling company and leaves it for something else and never quarrels with others*) behaviors were considered indicative of emotion regulation. Structural equation modeling was used to test the fit of a developmental model and indicated that emotional control at age 8, was related to healthy psychosocial functioning at age 36, such that the better one can regulate their emotions at age 8, the more likely one is to have healthy psychosocial functioning at 36. This finding indicates the predictive validity of emotional regulation to a healthy lifestyle in adulthood using a task performance measure of emotion regulation.

The importance of ER in healthy development is also apparent when we speak of its relationship to various psychological disorders. Emotional regulation, although not always labeled this way, plays a role in several psychological disorders. The Diagnostic and Statistical Manual (American Psychiatric Association, 2004) lists emotional regulation among symptom lists across disorders, but labeled differently in child, adolescent and adult disorders. Anxiety disorders are characterized by unrealistic,

persistent worries and fears, marked feelings of tension and an inability to relax. Elevated, expansive, depressed or irritable mood, inappropriate guilt, worry, pain or anxiety are criteria cited as symptoms of affective disorders in adults and personality disorders require irritability, rage, exaggerated affect, inappropriate anger, affective instability and rapidly shifting and shallow emotions for a diagnosis. These symptom lists use many terms to describe emotion dysregulation that may manifest itself differently in individuals making it difficult to consistently assess as part of a diagnostic evaluation. However, as previously noted, recent theory on emotional regulation indicates that emotional regulation plays a role in the definition, development and maintenance of childhood psychopathology.

One area of the field where research is particularly developed is the relationship between emotional regulation and social functioning of children. Data provides support for the link between the ability to regulate emotion and positive social development (Cole, Michel & Teti, 1994). When emotional regulation skills are deficient, the negative effects on social functioning can be easily observed and studies suggest that social outcomes are worse for children who are emotionally dysregulated.

Eisenberg and colleagues (1993), who have studied this area extensively, implemented a variety of indices of emotional regulation during their studies including adults' report of children's attention regulation (attentional shifting and focusing), temperamental impulsivity and inhibition control, global self control, and coping during peer conflicts as well as biological indices of ER such as vagal tone over the course of several studies to determine their relationship with measures of social functioning. After doing so, they found that these indicators of ER are significantly related to social

functioning, such that individuals who are emotionally dysregulated have poorer social functioning skills and are less likely to be viewed as socially desirable by their peers (Eisenberg et. al, 1993).

As these children get older, impairment is exacerbated. In adolescence, emotional reactivity is generally higher than other stages of life, making this group susceptible to anxiety, depression and suicide. Hare and colleagues (2008) used functional magnetic resonance imaging to measure what is considered to be the biological substrate of emotional regulation in limbic regions. The study determined that as a result of both heightened amygdala reactivity and their inability to regulate emotion during a task that required an opposite response to an affective signal, (i.e. approach fearful expressions that are associated with threat) adolescents were less able to control their emotions relative to children or adults. Researchers reasoned that when an adolescent who is unable to regulate emotion well is faced with a high level of emotion and does not have the social problem solving skills to cope with such emotion, they are put at risk for poor outcomes such as substance abuse (Hare et. al., 2008).

In addition to the negative impact of emotion dysregulation on social functioning, manifestations of emotion dysregulation such as depressed mood (Galaif, Chou, Sussman & Dent, 1998; Windle & Windle, 2001) and anger (McCreary & Sadava, 2000; Swaim et al, 1989) are also related to substance abuse. Using the Early Adolescent Temperament Questionnaire to (Capaldi & Rothbart, 1992) to measure both negative emotions and inhibitory control, one such study found that inhibitory control moderated the relationship between specific negative emotions and alcohol use. Data suggested that when children had good inhibitory control, anger was not associated with alcohol use initiation.

However, increased levels of anger were related to alcohol use when inhibitory control was low or moderate (Pardini, Lochman & Wells, 2004). Further, neurobehavioral disinhibition, a construct comprised of affect, behavior and cognition and indexed by measures of executive cognitive functioning, emotional regulation and behavior control, was as significant predictor of substance use disorders. In this longitudinal study examining risk factors of substance abuse, neurobehavioral disinhibition was more highly related to substance abuse than the frequency of substance consumption (Tarter et. al, 2003). Clearly, an inability to regulate emotion can lead to poor outcomes and highlights the importance of a reliable means of measurement of ER for the purposes of assessment and intervention when ER is determined to be a problem.

Definition of Emotion Regulation

A definition of emotional regulation or lack thereof has hindered progress in research examining the construct and its function within clinical populations including ADHD. Although regulation of emotion is an inherent part of human behavior, its precise definition has been very difficult to capture, so difficult, that researchers are currently operating under multiple conceptualizations of the same phenomenon. In order to advance our understanding of emotional regulation, there is a need to define the term, as the definition of any construct is crucial to its study, prediction, prevention, and treatment. The lack of a standard and accepted definition of emotional regulation is a factor that has contributed to the shortage of comprehensive measures of emotional regulation. Several definitions of emotional regulation have been proposed by various researchers:

Extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their intensive and temporal features, to achieve one's goals. (Thompson, 1994, pp.27-28)

The intra- and extraorganismic factors by which emotional arousal is redirected, controlled, modulated and modified to enable an individual to function adaptively in emotionally arousing situations. (Cinchetti, Ganiban & Barnett, 1991, p15).

Emotion regulation during the early years is developmental process that represents the deployment of intrinsic and extrinsic processes-at whatever maturity level the young child is at- to (1) manage arousal states for affective biological and social adaptations and (2) achieve individual goals. (Kopp & Neufeld, 2003, p. 360)

Clearly, there is some disagreement as to which components of emotional regulation should be included in the operational definition. The magnitude of this theoretical debate although warranted, far exceeds the limitations of this paper. However, we can focus on areas of overlap, which typically includes a reference to three features of emotional regulation, including the length of time one experiences an emotion, the intensity with which one experiences an emotion and the response that occurs following the experience of the emotion. The latter is of critical importance for clinical purposes as for clinicians, it is imperative not to determine a definition that would warrant some level of accord, but to examine proposed definitions of emotion regulation that might inform intervention development. Gross (1998) suggests that within ER, a focus on

response modulation is perhaps an area that warrants focus for clinical research, as it may be easier to modulate the expression of emotion than the experience of emotion. Thus, a measure that focuses on the strategies for coping with intense emotions may prove particularly valuable to clinical research.

Relationship Between ADHD and Emotion Regulation

One group that might benefit most ardently from ER intervention is youth with ADHD, one of the most common childhood disorders. Diagnosed in 2-9% of school aged children, ADHD is four times more common in boys than girls and accounts for 30-50% of referrals to mental health services. Its core symptoms are hyperactivity, impulsivity and inattention. Improvement in these core symptoms may come with age, an observation that likely contributed to the belief that children would “grow out” of the disorder. However, consequential impairment that manifests itself in a host of social, academic and behavioral problems in childhood not only continue into adolescence and adulthood, but tend to get worse. In addition 25%-75% of adolescents with ADHD qualify for DSM diagnosis of a comorbid disruptive behavior disorder causing additional complexity in their treatment. Another common characteristic of youth with ADHD is emotional dysregulation, described by researchers and clinicians as emotionally labile and inflexible to situational demands (Landau & Milich, 1998).

The most regarded and established theory of ADHD comes from Barkley (1997, 1998). His theory of executive functioning deficits in children and adolescents with ADHD suggests that a primary inhibitory deficit leads to four core secondary problems, one of which is a deficit of self regulation of affect, motivation and arousal. He defines self regulation of emotion as the ability to separate and modify the original affective

charge of an event resulting in a response that is deliberate, conscious and reasoned. Behavioral inhibition allows an individual to first inhibit his or her initial or primal response/emotion; second to stop any ongoing incorrect response/emotion and third, use this small delay in responding to develop a socially appropriate response/emotion. The inability to delay and modify this initial emotional response (i.e. to regulate the emotional response) to an event leads to a response that is often more emotive and less socially acceptable than those responses that have undergone self regulation. Barkley suggests that this problem is especially pronounced in the hyperactive-impulsive type of ADHD.

In recent years many studies have been conducted to investigate Barkley's theory and the role of emotional regulation in ADHD (Jensen & Rosen, 2004; Williams et al. 2008; Becker, Doane & Wexler, 1993; Berlin, Bohlin, Nyberg, & Janols, 2004; Melnick, & Hinshaw, 2000; Walcott & Landau, 2004). The results of these studies support two conclusions. First, youth with ADHD experience emotional dysregulation at a proportionately higher rate than those youth without ADHD. Second, measurement of emotional regulation in these studies has been vastly inconsistent, as currently, there exists no standardized instrument for the measurement of this construct. These discrepancies in the measurement of emotional regulation make drawing definitive conclusions regarding their implications extremely difficult.

Among these studies is one by Jensen and Rosen (2004) who examined Barkley's conclusion, that children with ADHD experience problems with emotion dysregulation at a higher rate than children who do not exhibit ADHD symptoms. The study compared youth between the ages of 6 and 15 (M=9.25yrs) with ADHD (combined and primarily hyperactive/impulsive type) to children without ADHD on measures of emotional

intensity and emotional reactions to both immediate and future events. Thirty children with ADHD and 30 children without ADHD participated in this study. Their emotional intensity was measured by the Emotional Intensity Scale (Braten & Rosen 2000), consisting of a 32 item parent report of perception of their child's emotional state during imagined scenarios. Twenty one items measure negative emotions and 11 items measure positive emotion. The score on each item (1-5) is summed to calculate subscale scores. Subscale scores are summed to find the total score which can range from 35-165.

Emotional reactions to external contingencies were measured by the External Contingencies Scale, a 20 item parent report of perceptions of the strength of their child's emotions in relation to 10 imagined rewards (rewards subscale), and 10 undesirable consequences (undesirable consequences subscale). The External Contingencies Scale was reported as reliable with a coefficient alpha of .91 reported for the total score and .90 and .87 for the positive and negative subscales. Inter item correlations ranged from .39-.79 ($p < .01$). Coefficient alpha of .9 was reported for the total score and alphas of .83 and .87 respectively were reported for the positive and negative subscales of the Emotional Intensity Scale (Braaten and Rosen 2000). Items are scored individually (1-5) and summed to create subscale and total scores. The Emotional Reactions to Immediate and Future Events Scale, a 36 item scale developed for the purpose of this study was used to measure parents' perception of their child's reaction to imagined emotional events at three different times; immediately, later that day and within a week. Each of the three time periods was assessed with the same questions, 12 items, 6 positive and 6 negative.

Multivariate analysis of covariance (MANCOVA) examining the effect of group on the positive and negative subscales of both the Intensity Scale and the External

Contingency Scale established several findings. The first was an effect of group. Examination of the univariate statistics revealed that the main effect was the result of significant group differences on the negative subscale of the Intensity Scale and the negative subscale of the External Contingency Scale. The ADHD group was more emotionally reactive to negative events than the group without ADHD, but were less emotionally reactive with regard to negative external contingencies. Further, a main effect for group was found on the three time periods of the Immediate and Future Emotions scale, indicating that the ADHD group was more emotionally reactive than the group without ADHD at all three time periods.

Although findings indicated that the group of children with ADHD had trouble regulating their emotions, perhaps more notable is the pattern of responding and where these differences manifested themselves within the groups. The finding indicating greater reactivity to negative events is consistent with suggestions that negative emotions are more often in need of regulation than positive ones. The inadequate reaction to negative consequences, indicating that individuals with ADHD are less likely to emotionally respond when they are punished for inappropriate behavior, may have clinical implications for treatment of ADHD. This conclusion has not been established previously and defies clinical wisdom, thus warranting further investigation. However, both findings have significant implications for the measurement of emotional regulation within this population, suggesting that emotionality within ADHD must be assessed with a method that accounts for event type (positive or negative) and consequences. Furthermore, this study leaves open the question of the strategies used by these youth to manage their intense emotions. These strategies may become potential targets for effective

interventions and understanding why there is a difference would likely have even greater impact than knowing that there is a difference.

Group differences between youth with and without ADHD on measures of ER have been established across two environments, home and school, as demonstrated by McIntosh and Cole-Love (1996). In this study, both teacher and parent ratings were used to assess the same group differences as those examined by Jensen and Rosen (2004). Parents' and teachers' ratings of emotional regulation were consistent, and indicated that the behavior of children with ADHD is significantly worse than children without ADHD in the domains of adaptability and emotional intensity. This is an important finding as it replicates the results of the Jensen and Rosen (2004) study and demonstrates that ER is consistent across environments.

Berlin, Bohlin, Nyberg and Janols (2004), also tested Barkley's theory, and compared a hyperactive-impulsive subgroup of boys with ADHD and a group of boys without ADHD. They sought not only to examine group differences, but also to determine how well, in terms of sensitivity and specificity; measures of executive functioning could classify children as ADHD or control. Among the executive functions they examined was self regulation, which they measured in two parts to tap into what they called sub-functions: regulation of arousal and emotional regulation. The child's regulation of arousal was measured by use of a continuous performance task (CPT) adapted from a previous study (Corkum & Siegal, 1993) where the child was instructed to respond only to a minority of 100 stimuli that were presented. Due to the monotonous nature of the task it was considered a challenge to the child's ability to adjust arousal to an optimal level for performing the task and therefore, omission errors on the task were

used as a measure of regulation and arousal. A parent rating scale was implemented to measure emotional regulation. It consisted of 9 items that tapped into negative emotions, as they reasoned negative emotions are more often those in need of regulation than positive emotions (example: “When my child becomes angry he has difficulty calming down on his own).

MANOVA and follow up ANOVA analyses revealed that boys with ADHD were significantly different than controls on the two measures of self regulation. In fact, the mean score of boys with ADHD on the emotional regulation measure, was twice that of controls ($p=.001$) indicating considerable impairment of emotional regulation in the boys with ADHD. Findings suggest that one of the primary deficits of ADHD is highly related to regulatory processes, specifically with regard to emotional regulation, but several issues with the methodology of this study lead to criticism and warrant further investigation.

The reliability of the parent rating scale measuring emotional regulation in this study was reported to be good with Cronbach’s alpha equal to .94, but construct validity remained questionable. It is possible that the complexity of the construct and the inability for researchers to come to a definitive conclusion regarding a working definition of the construct, calls the rating into question. Also of concern is the risk of redundancy in the measures for several reasons. The first concern is the overlap in content of measures used assess emotion regulation and to classify participants as having ADHD. The CPT is often used to assess sustained attention, a core symptom of ADHD, but in this case was used to measure ER. In addition, there appear to be many reasons including motivation to complete the task, attention span and cognitive ability that would confound a child’s

performance on the CPT, warranting questions of validity. Further study of the measure is necessary to determine the effectiveness for its use in evaluating ER.

Contrary to the criticisms faced by the previous study, another conducted by Walcott and Landau (2004) reported findings consistent with those of Berlin et. al. (2004). The study compared emotional regulation within 6-11 year old boys with ADHD (combined or hyperactive/impulsive type only) and without ADHD. Subjects were assessed using a frustrating and competitive task. Each subject was told he would win a prize if he constructed a lego model faster than a boy in the next room who he could see and hear on a monitor. What the participant witnessed was actually a video tape of a boy completing the lego model and making statements about the ease of the task and how easily he would win the prize. Each lego model was missing pieces, making the puzzle unsolvable. Thus, the competitor on the video always won. Half of the boys in each group were instructed to hide their feelings if they became upset. Emotion regulation was measured by coding video tapes of the child completing the frustrating task. Behaviors such as slamming fists, whining loudly and crying were coded as moderate emotional expression. Frowning or grimacing, gestures of disappointment, grunts or verbal acknowledgement of frustration were coded as moderate emotional regulation, whereas an absence of these behaviors (regulation of emotion) was coded as no emotional expression. Inter rater reliability was calculated for global ratings using coefficient alpha for 20% of subjects. Adequate reliability was found for emotional intensity ($\alpha=.92$) and effectiveness at regulation ($\alpha=.68$). Intraclass correlation coefficients were also calculated with satisfactory levels of consistency between observers for Task oriented ($r=.92$), Negative Behavior ($r=.86$), no emotional expression ($r=.84$) and mild emotional

expression ($r=.74$). Moderate expression ($r=.44$) and “shuts down” (.39) were excluded from analyses by the authors as a result of low reliability.

When the four groups were compared (ADHD, controls, ADHD instructed to hide feelings and controls instructed to hide feelings), analyses revealed significant group differences on two fronts. Boys with ADHD displayed greater disinhibition and were less effective in emotion regulation than comparison boys, but further the ADHD group instructed to hide their emotion were also unsuccessful leading to group differences between them and their non ADHD counterparts.

Melnick and Hinshaw (2000) provided further insight into the comparison of subgroups of ADHD on measures of emotional regulation. However, the subgroups in this case were a highly aggressive and low aggressive group of boys with ADHD. These subgroups and a control group without ADHD were compared on measures of emotional regulation, accommodation and intense venting. The measure used in this study was similar Walcott and Landau (2004), in that the child was offered a prize for the successful completion of a Lego model. Again, the child was unaware that two essential pieces of the model were removed in an effort to induce frustration, but in this case the participant's parents were allowed to help the child, but not complete the task for him. Interactions were video taped and coded for seven behaviors. These behaviors were as follows: (1)Mild emotional ventilation: where the child displays through facial vocal or gestural medium or verbally acknowledges frustration, (2) Intense emotional ventilation, where the child strongly displays emotion by slamming fists or whining loudly, (3) Problem solves, by stating or demonstrating a plan to build the model within the existing conditions or has an alternative idea about how to achieve the goal of completing task

instructions, (4) Seeks help, where the child requests information or looks to the parent for help, (5) Accommodates, by cognitively reinterpreting the situation to find a tenable way or sees a “bright side”, (6) Negatively responds/focuses on the negative, makes statements or expressions focusing on the negative, threatening, or uncontrollable aspects of the task, or (7) Sits down, by temporarily immobilizing and backing down from the task demands.

Comparison of groups on this measure indicated that highly aggressive boys with ADHD displayed overresponsive emotionality and differed significantly to both low aggressive boys with ADHD and boys without ADHD. Measures of peer desirability were also assessed during the course of the study and revealed that not surprisingly, the highly aggressive subgroup were less preferred socially. Furthermore, this study found that the specific strategies that these boys engaged to self regulate their emotion during a frustrating task accounted for 35% of the variance in outcome measures. These strategies included problem solving, seeking help, accommodating, or shutting down. Again, this demonstrates the importance of emotion regulation in successful social functioning.

A standardized measure was implemented by Barry, Barry, Garland and Lyman, (2004) to investigate the differences in emotional regulation between children with ADHD and controls. However, a lack of measures of emotional regulation led the authors to use the Behavior Assessment System for Children (BASC) coupled with a measure of adaptability as a means to measure ER. The authors found that children with ADHD scored significantly higher than their non ADHD counterparts on a variety of behavioral and emotional measures such as parent ratings of aggression, conduct

problems, anxiety, depression, somatization and atypicality (measured by the BASC) and significantly lower than controls on the measure of adaptability.

Although the BASC is supported in the literature as being psychometrically sound, it is a standardized instrument designed to assess the behavior of children in a variety of areas including internalizing and externalizing behaviors, not the measurement of emotional regulation. Theory suggests that scores on this measure should correlate with that of a measure of emotional regulation, because these behaviors would occur more frequently in those who are unable to regulate emotion, but significant variance between BASC and ER scores may still exist. The authors also used a measure of adaptability to contribute to their assessment of ER. Researchers generally regard the ability to adapt to be one component of and positively related to the ability to regulate emotion, but these scales are unlikely to sufficiently measure the construct of ER.

It is unfortunate that definitional and methodological issues in the measurement of emotional regulation have hindered the advancement of research in the field. After all limitations are considered it seems likely that a relationship exists between deficits in emotional regulation and the difficulties experienced in multiple areas of functioning by individuals with ADHD. Questions as to subtype differences, the effect of attention on emotion regulation and the role of emotional regulation in the treatment of ADHD represent just a few areas in need of further investigation. Furthermore, a measure that focused on successful and unsuccessful strategies for managing ER may offer additional insight by identifying those techniques most deficient in youth with ADHD and providing a target for intervention development. However, the ability to examine these areas relies entirely on our ability to reliably assess the construct of emotional regulation. If a

psychometrically sound instrument was developed specifically for the measurement of emotional regulation and could be easily implemented, multiple questions that remain at the conclusion of these studies could be addressed.

Given these questions and the pervasive and impairing nature of emotional dysregulation within the ADHD population, it is essential that researchers have access to appropriate and psychometrically sound assessment methods to further the examination of the construct and to determine how ER functions within this disorder specifically as well as how it may be prevented and treated. This does not currently exist for two reasons. The first is that researchers are operating under multiple definitions of the same construct and the second is that although several instruments have been developed and studied to measure emotional regulation, none of these instruments have been studied sufficiently to serve as a “gold standard”.

Measurement of Emotion Regulation

Zeman, Klimes-Dougan, Cassano and Adrian (2007) reviewed the existing measurement issues in emotion research with children and adolescents. The authors supported a multi method approach to the assessment of ER. Specifically, they discussed self report, other report, observational and neuroscientific methodology, each of which comprise the basic types of assessment used to measure emotional regulation. Some published examples of these measures are reported in Table 1.

Self report. Self report is presented as the best method available to assess emotion, as the individual experiencing emotion is able to “monitor, assess and integrate information about their emotions, and therefore, self report measures should not be thought of as second rate proxies for better measures” (Larsen & Prizmic-Larsen, 2006,

p.343). Interviews, open ended questionnaires and projective tests such as the Rorschach Inkblot have been implemented in multiple studies. However, the format of a structured rating scale is favored by Zeman et. al (2007), as a questionnaire using a likert scale of 3-9 points provides the most efficient, systematic approach to measuring the frequency and intensity of emotional behavior.

Other report. The importance of the social component of emotion regulation makes other report by someone familiar with the child, typically a parent, an integral part of the multimethod approach to assessment of ER. Rating scales and structured interviews have been used most frequently in this category of assessment, each of which tends to focus on the maladaptive expression of emotion, which is as important to capture as adaptive expression of emotion. This area of research is far from establishing norms for the maladaptive expression of emotion across various psychological disorders, but parent reports of emotion regulation can be utilized to aid in the process of establishing these norms, which is vital to our understanding of how emotional regulation functions within a variety of populations. Therefore, it is extremely important to use parent report as a means of assessment when studying ER.

Parent report of emotional and behavioral problems is also particularly important when working with youth with ADHD, as research indicates that this group may not be able to appropriately evaluate their own behavior, such that they minimize their problems (Fischer, Barkley, Fletcher & Smallish, 1993).

Observation. Observational methods are an informative means of evaluation. In research on ER most observation is implemented during a performance task. Considered by many researchers to lack generalizability, performance tasks have also been criticized

because of the effect of cognitive ability, fatigue and motivation may affect the reliability of the scores the task produces. Task oriented performance measures are also time consuming, taxing resources that do not allow access to the motivation behind the behavior. On the other hand, performance tasks are less prone to rater bias. Given that the reliability and validity of self and parent ratings of ER has not been studied, the observational method may provide insight not captured elsewhere.

Neuroscience. Neuroscience although a promising field, faces significant challenges and is therefore the least utilized assessment method of ER in research and clinical settings. Although the physiological component of emotion is well established, the neurophysiological systems that are involved are complex and the methods by which these systems are examined such as electroencephalography and PET scans are invasive (some requiring sedation), can be performed only by a highly qualified professional, generate results that with little application to daily behavior, and are extremely costly. The bulk of research in this area has been done on animals and what we do know from human research comes primarily from adults. Given the developmental changes that occur with emotion processing it seems unlikely that we can generalize this research to children and adolescents without further evaluation.

Reliability analysis, in the form of coefficient alpha, for some published examples of the four categorizations of measures is summarized in Table 1. The current study examined one particular measure of ER- The Emotional Regulation Scale (ERS; Kovacs, M., 2005), see appendix 1. The ERS includes a self and parent report of two components of emotional regulation: the frequency with which strategies in the given domain are used regardless of whether the strategies are positive/adaptive or negative/maladaptive and the

degree to which the individual uses positive/adaptive and avoids negative/maladaptive strategies to regulate and control emotional experience. This emphasis on the use of strategies has an advantage over other measures of having potentially valuable implications for intervention development targeting ER. If certain strategies or a specific balance of positive and negative strategies are identified as facilitating optimal functioning in youth with ADHD, then children may be taught to employ and avoid the identified techniques. The purpose of the current study is to explore the psychometric properties of the Emotional Regulation Scale in an effort to determine its appropriateness for use in exploring research questions regarding emotional regulation with the ADHD population.

Benson and Hagdvet (1996) and Benson (1998) outline steps in development of a strong program of validation that serves as a framework for the examination of the psychometric properties of a measure. The framework is based on three stages: Substantive stage, structural stage and external stage. The substantive stage is based on the premise that theory guides the assessment of a construct and focuses on the content of a measure on the item level. It calls for the generation of theoretical and empirical definitions based on previous research and observation. The structural stage involves the examination of item and subscale intercorrelations. This often includes exploratory or confirmatory factor analysis. The third and final stage of Benson's framework is the external stage. Focusing on criterion related evidence based on correlations between the measure being examined and other related measures, this stage involves gathering the evidence needed to theorize models that can be tested using structural equation modeling; the highest level of analysis according to these researchers.

The program of validation set forth by Benson and Hagdvet requires several studies to address all of the relevant questions. This study addresses the questions relevant primarily to the external stage of their developmental process by examining the reliability and validity of the ERS.

Given the current state of affairs within ER theory and measurement, Gross's process model for emotion regulation, which focuses on response modulation, presents the most potential for progress within this area of research. The structure of the ERS lends itself to measure responses to emotion and allows us to examine the role of ER within ADHD within the context of Gross' model. Further, should the ERS be determined to be an appropriate measure, it may be used to inform intervention development.

Current Study

Is the ERS reliable? The current study will determine whether the internal consistency of this administration of the ERS is acceptable and competes with that of other measures of ER currently employed in research.

Is the ERS valid? Validity, construct and predictive, will also be examined in the current study. Both theory and previous research have suggested that certain relationships exist between ER and other constructs. These relationships include that between ER and psychopathology, social skills, problem behaviors and ADHD subtype. The study seeks to determine whether those relationships are replicated when measuring ER via the ERS.

Method

Participants

Sixty three subjects ranging in age from 11-14 ($M= 12.22$, $SD= .80$) years participated in this study. The vast majority (94%) of them were Caucasian, with Hispanic, African American and Other making up only 6% of the sample. This was reflective of the rural population of the area in which the study was conducted (96.9% Caucasian, 1.4% African American, 3.3% Hispanic and 1.3 % Other) (US Census Bureau, 2004).

Participants were recruited for a study investigating the effects of a set of school based interventions and medication treatment called the Challenging Horizons Program (CHP). Parents referred their children to the study based on recruitment information requesting children with problems related to impulsivity, hyperactivity or inattention. Parents were screened on the telephone to determine if their children had a previous diagnosis of ADHD or scored a 6 or higher out of 9 on either the hyperactivity or the inattention subscales of the Disruptive Behavior Disorders Scale (Pelham, Evans, Gnagy & Greensdale, 1992). Evaluations at the Alvin V. Baird Attention and Learning Disabilities Center at James Madison University were scheduled for participants who passed either portion of the screen. After receiving an explanation of the research procedures and signing informed consent and assent forms, the evaluations were completed. Inclusion criteria for the study required that participants (a) meet Diagnostic and Statistical Manual of Mental Disorders (4th ed.' Text rev.; DSM-IV-TR; American Psychiatric Association, 2000) diagnostic criteria for one of the subtypes of ADHD; (b) have an IQ greater than or equal to 80 on the Kaufman Brief Intelligence Test (Kaufman

and Kaufman, 1990); and (c) Exclusion criteria included a diagnosis of bipolar disorder or schizophrenia and an IQ of below 80. Participants received a stipend for their time.

Procedure

Diagnostic criteria were assessed during the initial visit for participants recruited for a study of CHP. The complete assessment consisted of 6-8 hours of questionnaires, computer assessments and clinical interviews given to both the child and parent by a trained graduate or undergraduate psychology student to assess a variety of areas including social, emotional and behavioral functioning, ADHD symptoms, achievement and IQ. Specific assessment instruments used for diagnostic purposes included the Diagnostic Interview Schedule for Children (DISC-IV; Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000), parent version of the Disruptive Behavior Disorders Rating Scale (DBD; Pelham et. al. 1992), parent and teacher version of the Impairment Rating Scale (IRS; Evans, Allen, Moore, & Strauss, 2005), Kaufman Brief Intelligence Test (Kaufman & Kaufman, 1990), Wechsler Individual Achievement Tests-II (Wechsler, 1991), and Social Skills Rating System (Gresham & Elliott, 1990).

All participants met DSM-IV criteria for one subtype of ADHD based on the parent's answers to the structured diagnostic interview (DISC-IV), parent DBD, and the parent and teacher versions of the IRS rating scales. The DBD is a symptom rating scale completed by parents or teachers and includes the 18 symptoms of ADHD that are rated as "not at all", "just a little", "pretty much", or "very much" to indicate the degree with which the symptoms are observed by the rater. The parent version of the IRS is a rating scale assessing functioning across a variety of domains including relationships with peers, siblings, and parents as well as academic functioning, self-esteem, family impact,

and overall severity. The teacher version is similar, but asks about functioning including relationships with peers and teachers, academic and classroom functioning, and overall severity. Raters on both versions indicate the degree to which they believe functioning in these domains is not a problem and does not need treatment to an extreme problem that does need treatment. Raters place marks on a blank line between these extremes and the relative position of the mark on the line results in a score between zero (no problem) and six (extreme problem). Participants met criteria for ADHD if the parent responses to the DISC-IV were consistent with the DSM-IV criteria. If a parent reported a symptom on the DBD as present “pretty much” or “very much” but did not endorse it on the DISC-IV, it was considered present. Impairment across setting was considered present if reported on the DISC-IV and indicated on the parent and teacher versions of the IRS by ratings in at least one area of functioning of three or greater on parent or teacher versions. When teacher ratings were not available, as was the case for three participants, only parent report was considered. These procedures are consistent with best practices in diagnosing children and adolescents with ADHD (Pelham, Fabiano, & Massetti, 2005).

Measures

Behavior Assessment System for Children (BASC)

Although a teacher version is available, the parent and child versions of the BASC (Reynolds & Kamphaus, 1992) were used for the purpose of this study. The parent report consisted of 126 items that describe various child behaviors. The rater is asked to circle N if the behavior never occurs, S if the behavior sometimes occurs, O if the behavior often occurs or A if the behavior almost occurs. The instrument includes several subscales; however, for the purpose of this study only the Externalizing Problems subscale, which

tapped into aggression, hyperactivity and conduct problems and Internalizing Problems subscale, which consists of anxiety depression and somatization, were used. The child report consists of 186 items that many young people use to describe themselves. The rater is asked to circle T if they agree with the statement and F if they disagree with the statement. This instrument also includes several subscales such as clinical maladjustment, internalizing behaviors, externalizing behaviors, aggression and depression. The clinical maladjustment scale assesses anxiety, atypicality, locus of control, social stress and somatization. Internal consistency for the measure is reported to be in the mid .70s and above for individual subscales and in the mid 80s or better on composite scores. Test retest reliability of .70 is reported for individual subscales and .70s for the composite scores. Inter rater reliability of .67 is also reported (Reynolds & Kamphaus, 1992).

The Social Skills Rating System (SSRS)

The Social Skills Rating System is designed to assess the social and behavioral functioning of students in grades K-12, with differing versions available for preschool, elementary school and secondary school levels. Administered to both the participants and their parents, it consists of questions scored in a three point Likert scale in two areas: frequency of the behavior and importance of the behavior to the respondent. Participants took approximately 10 to 20 minutes to complete this instrument. Test-retest reliability for the SSRS is reported in the ranges of .65 to .93, with subscale reliabilities ranging at .48 to .88. Coefficient alpha is reported in the ranges of .81 to .85 (Gresham & Elliott, 1990).

The Reynolds Adolescent Depression Scale (RADS)

This instrument is a brief 30 item scale that evaluates the current level of an adolescent's depressive symptomology in four dimensions including dysphoric mood, anhedonia/negative affect, somatic complaints and negative self evaluation. The mean on measures of internal consistency for this instrument was .86 both for males and females. Several studies have also investigated test retest reliabilities and have all reported coefficients of approximately .80 (Reynolds, 2002).

The Diagnostic Interview Scale for Children (DISC-IV)

This instrument is a structured interview conducted by a trained graduate student with the parent in order to evaluate children according DSM-IV diagnostic criteria. Psychometric properties are good with reliabilities reported as greater than .70 for ADHD scale, .45-.67 for depressive disorders .44-.53 for anxiety disorders .70 or greater for ODD. All subscales of this instrument were utilized for diagnostic purposes. However, the Oppositional Defiant Disorder and Major Depressive Disorder scales were the only two subscales pertinent to the current study.

The Emotional Regulation Scale Parent and Youth Versions (ERS-See Appendix 1)

This instrument was published by Multi Health Systems Inc. to assess emotional regulation (defined as the ability to inhibit, subdue, minimize, maintain, accentuate, or prolong a particular emotion) in four different domains; behavioral, cognitive, physiological and social-interpersonal. Subscale scores are derived for each of these four domains. The biological domain is defined by MHS as arousability, vagal tone and neurotransmitters such as serotonin, dopamine system pathways, while the Social-Interpersonal domain is defined as physical contact, physical-emotional protection, positive attachment, comfort support or their opposites; and finally, the Cognitive domain

is defined as self talk, rumination, reformulation, generating alternative explanations, problem solving, denial and distraction. Two scores are calculated for each of the four domains, a frequency score and a skill score. The frequency score reflects the frequency with which strategies in a given domain are used regardless of whether strategies are positive/adaptive or negative /maladaptive. The skill score consists of a positive and a negative score which reflects the degree to which the individual uses positive/adaptive strategies and avoids negative strategies to regulate and control emotion experience. The measure consists of 68 items and has both parent and child versions. Psychometric properties for this instrument have not been reported to date.

Results

1. Is the Emotional Regulation Scale Reliable?

The reliability of ERS was be examined by calculating Cronbach's alpha for the current administration of the ERS. Cronbach's alpha was used to examine the reliability for several reasons. It is the most widely used method of estimating reliability in a single test administration and has been most widely reported as a measure of reliability in previous studies examining measures of emotional regulation. Cronbach's alpha is also most appropriate to use when examining a unidimensional construct. Although four subscale scores are obtained from the Emotional Regulation Scale, a theoretical factor structure for the construct of emotional regulation has not been tested and supported in the literature.

Internal consistency was examined for both the parent and youth versions of the ERS. Cronbach's alpha was determined to be acceptable by Nunnally's (1978) standard,

which suggests a cutoff of $\alpha=.70$. Child report of the measure was higher with $\alpha=.90$, while $\alpha=.84$ for parent report.

2. Is the Emotional Regulation Scale Valid?

In an effort to examine the validity of the ERS, the second analysis examined the relationship between the ERS and measures of psychopathology. This was achieved by calculating and the Pearson product-moment correlation coefficient between parent reports ERS and six measures of psychopathology: the internalizing, externalizing, anxiety, depression and locus of control subscales of the BASC and dysphoric mood and anhedonia subscales of the RADS. The total score on the ERS was examined in addition to the positive and negative subscale scores.

Preliminary analyses were performed to ensure that the assumptions of normality and linearity were not violated. The Pearson correlations were not statistically significant between positive subscale scores on the ERS and the six measures of psychopathology. Table 3 summarizes the results. Because power may be limited due to small sample size, effects sizes were also examined. Although the relationships between positive skills on the ERS and measures of psychopathology were not statistically significant, the relationship between the negative subscale score on the ERS and measures of psychopathology was strong. A strong positive correlation was found between the Negative subscale score of the ERS and Internalizing ($r=.531$; $p<.01$), Externalizing ($r=.578$; $p<.01$) and Depression ($r=.538$, $p<.05$) subscales of the BASC.

Neither positive nor negative subscales of the ERS correlated with Locus of Control subscale of the BASC or the Anhedonia or Dysphoric Mood Subscales of the RADS. The Total scores of the ERS correlated moderately and negatively with the BASC

Internalizing ($r=-.269$, $p<.05$) and Externalizing ($r=-.335$, $p<.05$) subscales. The relationship between the Total ERS score and the BASC Anxiety subscale was also moderate, but was positive ($r=.369$, $p<.01$).

An analysis of the relationship between the ERS and measures of social skills, aggression and Problem Behaviors were also examined to gather validity evidence.

Table 3 summarizes the results of Pearson correlations between the positive and negative subscale and total ERS scores and parent report on the SSRS as well as parent report of, Aggression and Problem Behaviors measured by the BASC. Similar to the results of the previous analyses, the positive subscale of the ERS did not correlate with social, aggression or problem behavior scores. The negative subscale of the ERS was moderately and negatively correlated with social skills ($r=-.356$, $p<.01$), with negative ER strategies indicating poor social skills. High scores on the negative subscale of the ERS were strongly and positively correlated with problem behaviors ($r=.669$, $p<.01$) and aggression ($r=.559$, $p<.01$). Total scores on the ERS were moderately and positively correlated with social skills ($r=.365$, $p<.01$), but negatively correlated with problem behavior ($r=-.467$, $p<.01$) and aggression ($r=-.342$, $p<.01$).

As the ERS data used in the current study was provided by MHS (the company responsible for publishing the measure) as part of an agreement between them and the ALDC, total scores on the measure were provided for each subject, but not scores by item. This circumstance, in addition to the sample size, did not allow me to assess reliability by means of confirmatory factor analysis. However, the utility of the scores obtained by the four subscales of the ERS was a topic of interest. Therefore, stepwise multiple regression analysis was conducted to determine the unique contribution of each

ERS subscale to the explanation of variance within 1.Social skills (parent report on SSRS), 2.Agression (parent report on aggression subscale on BASC) and 3.Problem behavior score (parent report of problem behaviors on BASC).

Multiple regression analysis was also used to determine the predictive utility of the Emotional Regulation Scale to determine social skills, aggression and problem behavior scores. Also of interest was the unique contribution, if any, of each of the subscales of the ERS on the prediction of social, aggression or problem behavior. In order to examine these questions, four subscale scores for the parent version of the ERS were used to predict scores on the SSRS and aggression and problem behavior scores on the BASC.

For each regression analysis, scatter plots were examined to determine that assumptions of normality, linearity and homoscedasticity were met (see appendix A). The variance inflation factor (VIF) were below 10 and tolerance above .10 for each of the four subscale scores entered in each of the three analyses. Correlations were also examined to ensure multicollinearity, correlations of .80 or higher, did not affect the results.

The test of the overall model predicting social skills on the SSRS using the four subscales of the ERS determined that the combination of the 4 subscales of the ERS predicted a significant amount of variance 19%, in social functioning scores, $R^2=.190$, $F(4, 54) = 3.170$, $p<.05$. However, when examined, none of the four subscales alone predicted a significant amount of variance in social skills scores.

The test of the overall model determined that the of the four subscale scores on the ERS together predicted a significant amount, 32.4% of variance in problem behaviors $R^2=.324$, $F(4, 54) = 6.470$, $p<.001$. and 20.9% in aggression $R^2=.209$, $F(4, 54) = 3.572$,

$p < .05$. Examination of the squared semipartial determined that the scores on the social skills subscale of the ERS contributed uniquely to the variance in both problem behaviors scores ($b = -1.801$, $p = .003$) and aggression scores ($b = -.572$, $p = .005$). Scores on the social subscale of the ERS explained an additional 12% ($sr^2 = .120$) of the variance in problem behaviors above and beyond the cognitive, behavioral and physical subscales of the ERS.

Further, the social subscale of the ERS explained 12.6% ($sr^2 = .126$) of variance in problem behaviors above and beyond the cognitive, behavioral and physical subscales on the same measure. The behavioral, physical and cognitive subscales were not found to contribute unique variance to the prediction of problem behaviors or aggression.

Discussion

The current study sought to begin the process of examining the psychometric properties of the Emotion Regulation Scale as a means of assessing emotion regulation. Overall, results of the study are promising, suggesting that the scores derived from the ERS during the current administration were reliable and valid.

Although calculations of coefficient alpha for self report were slightly higher than parent report on the ERS, both scores easily surpassed Nunnally's recommendation of $\alpha \geq .70$ indicating acceptable internal consistency. Further, these values were comparable, if not superior, to reports of the reliability of other emotion regulation measures established in previous studies. Table 1. reports alphas for several commonly used reports of emotional regulation. Values vary from $\alpha=.68-.93$ across self report, other report, and observational methods of assessment. $\alpha=.90$ for self report on the ERS surpasses $\alpha=.80$ on the Negative Mood Regulation Scale and is comparable to $\alpha=.93$ reported for the Difficulties in Emotion Regulation Scales. A value of $\alpha=.84$ calculated for the parent report of the ERS is within range of values reported for the Emotional Control Questionnaire ($\alpha=.81$), the Emotion Regulation Checklist ($\alpha=.89$) and the Emotional Intensity Scale ($\alpha=.90$).

The results of validity analyses are more complex in their implications. Although guidelines for what constitutes an acceptable correlation between measures of emotional regulation and other constructs do not exist, both theory and previous research suggest that the associations between the ERS and measures of psychopathology, social skills and problem behaviors should be apparent.

The results of the current study suggests that it is not the extent to which one uses positive/adaptive strategies to regulate emotion but one's ability to avoid negative/maladaptive strategies that is related to one's psychopathological, social, aggression or problem behaviors. The correlational analysis did not determine that this relationship is causal, but did indicate that emotion regulation as measured by the ERS may play a role in psychosocial functioning. Further, both the non relationship between the positive subscale of the ERS and the significant relationship between the negative subscale of the ERS have implications for how we measure and target ER. An inability of youth with ADHD to successfully implement positive strategies to deal with emotion regulation could be attributed to this finding, but it could also indicate that further examination of the items corresponding to the positive skills subscales is needed. An item analysis, if conducted, could call these results into question should it reveal that items do not load on the factors they are written to measure. If the analysis revealed that items were loading on the appropriate factors, this could indicate that youth with ADHD are unable to implement positive emotional regulation strategies; indicating the need for further examination as to the reason for this inability and possible interventions to correct this problem.

The positive correlation between the negative skills score and internalizing and externalizing symptom subscales of the BASC makes sense theoretically, as one might surmise that the use of ineffective strategies to regulate emotions would manifest in internalizing behavior such as anxiety or depression or externalizing behavior such as disruptive or conduct problems. This finding also calls the validity of the positive

subscale into question. Researchers may be just as effective in measuring emotion regulation by solely using the negative subscale.

Neither positive nor negative subscales of the ERS correlated with Locus of Control subscale of the BASC. Although hypotheses were not made regarding these relationships prior to analyses, results are logical if one considers locus of control a construct that pertains to control of external events rather than emotion regulation, which pertains to internal control. This finding may be further investigated to determine if the results may contribute to discriminant validity evidence for the ERS.

Most notably within the findings of the current study are the clinical implications for youth with ADHD. The results of the current study suggested a relationship between emotional regulation and psychopathology, social skills and problem behaviors, indicating at least the need to assess emotion regulation within this population. Should the nature of this relationship be determined causal or influential, the information may inform our inclination and ability to integrate emotional regulation interventions into psychosocial treatment programs if warranted.

Within the examination of interventions, questions also arise specific to the four types of emotional regulation - physical, behavioral, cognitive and social, and any respective strategies that may be used to target them. The social subscale proved to be most informative to the prediction of social, problem and aggression behaviors. Not only could this information be useful to the refinement of the measure, but the results of the study indicate that the items make up the social subscale of the ERS could be used to strategize intervention targeting ER. This could also lead to studies exploring the development, feasibility and fidelity of such strategies.

Limitations and Future Research

The factor structure of ER is not yet defined within the literature. Therefore, the subscale scores of the ERS are called into question. An exploratory factor analysis would be beneficial to our understanding of the components of the construct and justify the use and interpretation of subscale scores in addition to the total score on the ERS.

Unfortunately, using a recommendation of 5-10 subjects per item, a sample size of 340-680 subjects is needed to perform this analysis. The sample for the current study was much smaller, making it impossible to examine the factor structure of this scale. Further, subscale scores were provided by MHS for each subject in the study, but scoring instructions including the items corresponding to each subscale were not, limiting the ability to examine the internal consistency of each of the subscales and the relationships between each subscale score and the total score of the ERS. Furthermore, I was unable to specify implications of some of the findings pertaining to specific subscales such as the social scale. The items that contributed to this factor score might provide specific indications of targets for intervention development. The results of the multiple regression analysis that determined the social subscale of the ERS was the only subscales that contributed unique variance above and beyond the cognitive, behavioral and physical to the prediction of scores on constructs thought to be related to ER make the need for a CFA that much more apparent. Thus, the factor structure of the ERS remains an opportunity for further research.

The debate over informants and the validity of their report of symptomology of disruptive behavior disorders is well documented, Mitsis et al. (2000). The current study utilized parent report of emotion regulation and other measures for analyses, which was

deemed appropriate given evidence suggesting that youth with ADHD demonstrate a positive illusory bias, meaning that they overestimate their competence (Owens, Goldfine, Evangelista, Hoza, & Kaizer, 2007). Although parent report is important, especially in this case, further study of the implications of self report and teacher report is perhaps equally important. Development of a teacher version of the ERS could be valuable to the understanding of emotion regulation and how it functions within the ADHD.

In addition, future research on the reliability and validity of the ERS are warranted. The current study provides a small contribution to a body of evidence that is needed to validate or fail to validate the scores produced by the ERS. In order to achieve this, several studies are required using a variety of approaches, samples and populations over time. Obvious changes in emotional regulation occur as adolescents become adults, however our understanding of emotion regulation and its development specifically within ADHD is less clear and in need of further study to determine if the ERS is an appropriate tool to use in both child and adult populations.

The evidence provided in this study supports the use of the ERS for emotion regulation research, but it does little to narrow the many definitions that currently occupy the field of emotion regulation theory. An operational definition is desperately needed as well as a nomological network that may help us understand the construct of emotion regulation and how it functions. Many questions remain, and although the ERS may be a tool that will help answer some of these questions, it is imperative that we remain focused on the topic to make significant progress in this field of research.

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Methods	Format	Examples of Instruments	Coefficient α
Self Report	Questionnaire	Difficulties in Emotion Regulation Scale (DERS) (Gratz & Roemer, 2004)	$\alpha = .93$
		Negative Mood Regulation Scale (NMR)(Catanzaro & Mearns, 1990)	$\alpha = .80$
Parent Report		Emotion Regulation Checklist (ERC)Child-Shields & Cicchetti (1997)	$\alpha = .89$
		Emotion Control Questionnaire (Roger & Najarian, 1989)	$\alpha = .81$
		Emotional Intensity Scale (Braten & Rosen, 2000)	$\alpha = .9$
Observation		Frustrating Lego Task (emotional intensity, effectiveness at regulation) (Walcott & Landau, 2004)	$\alpha = .9; .68$
		Lego model completion (Melnick & Hinshaw, 2000)	$\alpha = .87$
Neuroscience		Neuroimaging (Davidson & Fox, 1989) Electroencephalography (Lewis, Lamm, Segalowitz, Stieben & Zelazo, 2006) Electrocardiogram (Gottman et. al., 1996)	

Table 2.
 Summary of Stepwise Multiple Regression Analysis for 4 ERS subscales predicting Social Skills,
 Problem Behavior and Aggression

Variable	β	sr^2	<i>B</i>	Sig
Social Skills				
Behavioral	0.26	0.07	0.10	0.82
Cognitive	0.53	0.14	0.17	0.08
Social	0.96	0.22	0.25	0.00
Physical	-2.13	-0.17	-0.16	0.08
Problem Behaviors				
Behavioral	0.11	0.03	0.04	0.82
Cognitive	-0.95	-0.24	-0.27	0.08
Social	-1.80	-0.39	-0.43	0.00
Physical	2.91	0.24	0.20	0.08
Aggression				
Behavioral	0.06	0.05	0.07	0.70
Cognitive	-0.14	-0.11	-0.13	0.43
Social	-0.57	-0.37	-0.44	0.01
Physical	0.47	0.12	0.11	0.40

Table 3. Correlations between ERS and Measures of Psychopathology

Methods	BASC Internalizing	BASC Externalizing	BASC Anxiety	BASC Depression	BASC Locus of Control	RADS Dysphoric Mood	RADS Anhedonia
ERS Positive Subscale	0.068	0.019	-0.047	0.049	0.12	-0.06	-0.065
ERS Negative Subscale	0.531*	0.578*	0.233	0.538*	0.194	0.165	0.078
ERS Total Score	-0.269	-0.335	0.369	0.288	-0.027	-0.145	-0.096

Note: * $p < .001$