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Emotion Regulation and Psychopathology

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Emotion disturbances are very common in psychopathology, and research over the last several decades has more clearly specified the nature of these disturbances. However, the extent to which these emotion disturbances can be cast as emotion regulation problems remains less clear. One major impediment to clarifying this issue has been the definitional ambiguity surrounding the concept of emotion regulation, and this is an urgent need for the field to address. We argue that advances in basic research on emotion regulation nevertheless hold much promise toward uncovering how emotion regulation difficulties may (or may not) characterize different types of disorders. We adopt the process model of emotion regulation developed by Gross and colleagues (e.g., Gross, 1998, 2001) to examine how emotion regulatory processes may play a part in psychopathology, reviewing the evidence for emotion regulation difficulties in a number of disorders (major depression, bipolar disorder, schizophrenia, anxiety disorders, borderline personality disorders, and frontotemporal lobar dementia). We conclude with a discussion of the implications for assessment and treatment, and the limits and potential for emotion regulation research in psychopathology.

"The distraction of our mind is result of our blind surrender to our desires, our incapacity to control or moderate our passions.

—Savages, 1772, as quoted in Foucault, 1965, p. 77.

Emotions play a central role in human life. They help us to respond to problems and challenges in our environment; they help us to organize our thoughts and actions, both explicitly and implicitly; and they guide our behavior. Perhaps because our emotions exert such widespread influence, we spend a good deal of time trying to influence or regulate how we feel and how we present our emotions to others. Given their centrality, it is not surprising that emotion disturbances figure prominently in many different forms of psychopathology. By one analysis, as many as 85% of psychological disorders include disturbances in emotional processing of some kind (Thoits, 1985), whether they be "excesses" in emotion; "deficits" in emotion, or the lack of coherence among emotional components. Indeed, as illustrated in Table 14.1, many of the disorders found in the current *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text revision; DSM-IV-TR; American Psychiatric Association, 2000) include one or more symptoms reflecting an emotion disturbance. Research designed to uncover the nature of emotion disturbances in different psychological disorders has flourished in the last 15 years (for reviews, see Berenbaum, Raghavan, Le, Vernon, & Gomez, in press; Keltner & Kring, 1998; Kring, 2001). At the same time, research in the emerging field of emotion regulation has also burgeoned, with an emphasis on understanding the basic properties associated with the regulation of the experience and expression of emotion (e.g., Cicchetti, Ackerman, & Izard, 1995; Gross, 1998; Thompson, 1994). As the aforementioned quote illustrates, the notion that unregulated emotions lead to madness has a firm place in history. Moreover, contemporary writings on emotion and psychopathology often cast emotion disturbances as problems in regulation. Unfortunately, the framing of emotion disturbances in psychopathology as problems in emotion regulation has often been done with limited empirical support. The central goal of this chapter is to critically consider the extent to which the emotion disturbances in psychopathology can be construed as problems in emotion regulation. To do so, we first discuss current definitions of emotion and emotion regulation and the ways in which these two constructs may (or may not) be distinguishable. Second, we consider the concept of emotion dysregulation and the ways in which dysregulation can be distinguished from regulation. Next, we review the evidence for emotion regulation problems in different types of psychological disorders, focusing our attention primarily on disorders that affect adults (for consideration of emotion regulation problems and developmental psychopathology, see Calkins & Howse, this volume). Finally, we conclude with a consideration of the implications that emotion regulation problems in psychopathology have for assessment and treatment, with an eye toward future research.

TABLE 14.1

Emotion-Related Symptoms in *Diagnostic and Statistical Manual of Mental Disorders*, 4th ed., Text Revision Disorders of Adulthood

Disorder	Emotion-Related Symptom
Schizophrenia, Schizoaffective, Schizophreniform Disorder	Affective flattening, anhedonia
Major depressive episode	Depressed mood; anhedonia
Manic episode	Elevated, expansive, or irritable mood
Dysthymia	Depressed mood
Hypomanic episode	Elevated, expansive, or irritable mood
Panic Disorder	Intense fear or discomfort
Agoraphobia	Anxiety
Specific phobia	Marked and persistent fear, anxious anticipation
Social phobia	Marked and persistent fear, anxious anticipation
Obsessive-Compulsive Disorder	Marked anxiety or distress
Posttraumatic Stress Disorder	Irritability, anger, physiological reactivity, distress, anhedonia, restricted range of affect
Acute Stress Disorder	Symptoms of anxiety or increased arousal
Generalized Anxiety Disorder	Excessive anxiety and worry, irritability
Hypochondriasis	Preoccupation with fears of having disease
Anorexia Nervosa	Fear of gaining weight
Sleep Terror Disorder	Intense fear and signs of autonomic arousal
Pathological Gambling	Irritability, dysphoric mood
Adjustment Disorder	Marked distress
Paranoid Personality Disorder	Quick to react angrily
Schizoid Personality Disorder	Emotional coldness, detachment, flattened affectivity
Schizotypal Personality Disorder	Inappropriate or constricted affect, excessive social anxiety
Antisocial Personality Disorder	Lack of remorse, irritability
Borderline Personality Disorder	Affective instability due to marked reactivity of mood, inappropriate intense anger, or difficulty controlling anger
Histrionic Personality Disorder	Rapidly shifting and shallow expressions of emotions
Narcissistic Personality Disorder	Lacks empathy
Avoidant Personality Disorder	Fear of criticism, disapproval, or rejection
Dependent Personality Disorder	Fear of being unable to care for self, being left alone
Alcohol intoxication	Mood lability
Alcohol withdrawal	Anxiety
Amphetamine intoxication	Euphoria or affective blunting; anxiety, tension, anger
Amphetamine withdrawal	Dysphoric mood
Caffeine intoxication	Nervousness, excitement
Cannabis intoxication	Euphoria, anxiety
Cocaine intoxication	Euphoria or affective blunting; anxiety, tension, anger
Cocaine withdrawal	Dysphoric mood
Hallucinogen intoxication	Anxiety or depression
Inhalant intoxication	Belligerence, euphoria

TABLE 14.1 (cont.)

Disorder	Emotion-Related Symptom
Nicotine withdrawal	Dysphoric or depressed mood; irritability, frustration, anger, anxiety
Opioid intoxication	Euphoria followed by dysphoria
Opioid withdrawal	Dysphoric mood
Phencyclidine intoxication	Belligerence
Sedative (etc.) intoxication	Mood lability
Sedative (etc.) withdrawal	Anxiety

DEFINING EMOTION

Drawing from over a century of theory and research, there is fairly good consensus that emotions are adaptive and serve important functions. We concur with a host of theorists who define emotions as complex systems that developed through the course of human evolutionary history to prepare an organism to act in response to environmental stimuli and challenges. Furthermore, emotions are comprised of a number of components, including (but not limited to) expressive, feeling or experiential, and physiological, that are typically coordinated within the individual. Indeed, the coordination of these components, under most circumstances, serves a number of important intrapersonal and interpersonal functions (e.g., Ekman, 1994; Frijda, 1986; Keltner & Kring, 1998; Lang, Bradley, & Cuthbert, 1990; Levenson, 1992).

In addition to the term *emotion*, a number of other terms are used in the emotion literature. Although the terms *affect* and *emotion* have been used interchangeably, a number of theorists and researchers have distinguished between the terms, both conceptually and empirically. Generally speaking, the term *affect* is most often used in reference to feeling states, whereas emotions comprise multiple components (only one of which is a feeling state) and are hypothesized to occur in response to some object, person, or situation, whether real or imagined (e.g., Feldman Barrett & Russell, 1999). Russell and Feldman Barrett (1999; see also, Feldman Barrett & Russell, 1999) argued that affect, or as they described, *core affect*, reflects feeling states that are ever-present and are just one of many constituents of what they refer to as *prototypical emotion episodes*. Prototypical emotion episodes are hypothesized to occur in response to some event, whether internal or external, and are comprised of cognitive, behavioral, feeling, and physiological components. In their analysis, moods are core affects that endure for a longer period of time. Using the framework of Russell and Feldman Barrett (1999), much of the research on emotion disturbance in psychopathology has been concerned with the various components of prototypical emotional episodes, one of which is (core) affect, although some research has been concerned with just one component, namely the experience of feeling states or core affects.

Although the theorizing of Feldman, Barrett, and Russell (1999) has contributed a good deal toward disambiguating various emotion constructs, not all studies and measures used in various studies follow this rubric. Thus, integrating findings about emotion disturbances in psychopathology is hindered by a lack of clarity in definition and use of terminology. Nevertheless, in our review, we explicitly note the component of emotion each measure refers to if it is not already obvious.

DEFINING EMOTION REGULATION

Although there is fairly good consensus in the field as to what constitutes emotion, there is less agreement on what constitutes emotion regulation. Perhaps owing to the relatively recent research emphasis on emotion regulation, a number of key definitional issues have yet to be fully resolved. Despite the definitional ambiguity surrounding the concept of emotion regulation, there is often an explicit assumption that different psychological disorders, particularly those affecting children, are rife with problems in emotion regulation. This assumption may come, in part, from historical notions that out-of-control emotions or passions led to madness, as illustrated by the quote by Sauvages (1772, as quoted in Foucault, 1965) presented at the beginning of the chapter. Furthermore, different types of psychotherapy emphasize gaining or regaining control over one's emotions as a pathway to mental health (e.g., Greenberg & Safran, 1987). Emphasizing emotion regulation in treatment implicitly suggests that loss of control over one's emotions may have contributed to the development of the problem, much the same way that pharmacotherapy targeted toward particular neurotransmitter systems implies that problems in these neurotransmitter systems contributed to the development of the disorder.

In our view, however, these assumptions are premature. Indeed, until greater conceptual clarity surrounding the concept of emotion regulation is achieved, progress toward understanding emotion regulation problems in psychopathology will be stalled. Here, we briefly outline some of the key definitional problems associated with the concept of emotion regulation.

The Scope of Emotion Regulation

Although a number of definitions of emotion regulation have been offered, they differ in a number of ways, including what types of regulatory processes are involved, what types and components of emotion are regulated, whether the regulatory processes are internal or external (or both), and whether regulatory processes are implicit or explicit (or both). One of the most recent and influential definitions of emotion regulation has been offered by Gross (1998), who defined the construct as "... the processes by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions" (p. 275). This definition locates emotion regulation within the individual, and impor-

tantly, it emphasizes that multiple components of emotion (expression, experience) can be regulated. Gross argued that regulatory processes can be explicit or implicit, and his empirical work has demonstrated that regulatory processes can occur before an emotion is generated as well as after it comes "online." For example, taking a different route to the office to bypass a confrontational coworker is a means of regulating feelings of anger before they occur; suppressing laughter in church is a way of regulating ongoing feelings of amusement. Furthermore, Gross proposed that emotion regulatory processes vary on a continuum of conscious, effortful regulatory processes to those that are less effortful, outside of conscious awareness, or automatic. Contributing to the influence of Gross's conceptual work on emotion regulation is the program of empirical research that has been conducted in the past several years to support the processes outlined by his definition (see Gross, 2001, for a review).

Other definitions include the notion that external influences, particularly other people, also figure into the regulation of emotion (e.g., Calkins, 1994; Eisenberg & Fabes, 1992; Thompson, 1994). According to Thompson (1994), "Emotion regulation consists of the extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their intensive and temporal features, to accomplish one's goals" (pp. 27–28). According to Thompson, an important regulatory process is located with interactions with and influences from other people. For example, a wife's anger at her husband's behavior is soothed by her husband's attempts to offer reparations for his transgression. Parents often exert regulatory efforts toward their children's emotions, by, for example, reframing a particular situation ("the shirt from Grandma is not so bad; you can wear it for Halloween!"). Still other definitions emphasize that emotion regulatory processes also necessarily regulate other cognitive processes, such as attention (e.g., Cole, Michel, & Teti, 1994).

The role of context is differentially emphasized in definitions of emotion regulation. To be sure, situational and contextual demands on regulatory processes are great. Moreover, momentary changes in context may require different regulatory efforts. For example, when celebrating a victory among teammates, shouts of jubilation are context-appropriate; however, if the opposing team enters the room, thus altering the context, a more dampened display would be appropriate. The emphasis on context is more explicitly acknowledged in those definitions generated from the developmental tradition, emphasizing how children do and do not regulate their emotions (e.g., Cole et al., 1994; Thompson, 1994). Indeed, ineffective emotion regulation among children is often inferred on the basis of context-inappropriate nonverbal behavior. Among adults, contextual influences are still great, but they are difficult to ascertain and distinguish from regulatory processes that have likely become more automatic or effortless across time and multiple exposures to a particular context or situation. For example, children are notoriously bad at suppressing laughter in an inappropriate context (e.g., class-

room, church), whereas adults, presumably with more practice, are much better able to squelch inappropriate giggles.

Distinguishing Emotion From Emotion Regulation

Perhaps one of the more vexing issues facing the field of emotion regulation is distinguishing emotion that is and is not regulated. Davidson (2000) offered, "... regulatory processes are an intrinsic part of the landscape of emotion, and rarely does an emotion get generated in the absence of associated regulatory processes" (p. 372). Similarly, Cole et al. (1994) suggested, "... emotion is inherently regulatory and regulated, two processes that are subsumed under the term emotion regulation" (p. 74). By these accounts, then, emotion does not need to be distinguished from emotion regulation because (nearly) all emotion is regulated (see also Frijda, 1986). Although the conceptual and empirical challenges associated with distinguishing emotion and emotion regulation are great, suggesting that all emotion is regulated emotion seems akin to saying that all behavior is unconsciously motivated—it is an assertion that is essentially untestable.

Furthermore, recasting problems of emotion as problems in emotion regulation has the potential to oversimplify the nature of emotion-related problems, minimize the role of individual differences in emotional experience and expression, and implicitly attribute a problem where none may actually exist. For example, if an individual experiences strong negative emotions, is this a problem in regulation insofar as the individual can't down-regulate these strong feelings? By contrast, might this be a person who simply feels things more strongly and thus does not have a regulatory problem at all? It is likely that both types of individuals exist in the world, and that the emotion-related outcomes associated with these two individuals would be quite different. To illustrate with a different example: If a child displays anger when a favorite toy is taken away, is this a problem in emotion regulation or is it a child who more readily displays his or her feelings when angry? In other words, is this a highly expressive child? A child who failed to express anger in this scenario could be viewed as an effective emotion regulator, to the extent that an anger display was considered inappropriate to the context. However, the child might be a relatively unexpressive child who does not readily show his or her feelings. Or, the child may not actually feel anger in this situation, and thus the lack of anger expression would match the feeling state.

Equating differences in amount or intensity of facial expression with an emotion regulatory process can minimize the important role of individual differences in emotional expression and experience (Gross, John, & Richards, 2000). Furthermore, regulation of an emotion assumes that the emotion has somehow changed course (Gross, 1998). Yet, this assumption requires knowing the trajectory of that emotion in its unregulated form, and this is unfortunately not often included in studies presuming to assess emotion regulation.

Distinguishing between emotion and emotion regulation has important implications for understanding emotion-related disturbances in psychopathology. For example, in mania, it would seem important to distinguish whether the abundance of positive emotion (and irritability) is a problem in down-regulating excess emotion, matching emotion to context, or simply an excess of emotion that is experienced with control processes intact. To further illustrate, children with Attention Deficit and Hyperactivity Disorder (ADHD) are often ascribed with deficits in emotion regulation. A common paradigm with these children is the disappointing prize scenario whereby children are shown a group of desirable (e.g., candy) and undesirable (e.g., baby toy) prizes. Children are then presented a desirable and undesirable prize in the presence of an experimenter, and their nonverbal behavior is recorded and later coded. In a study of children with ADHD, ineffective emotion regulation was inferred when children displayed negative nonverbal behavior in the disappointing condition (e.g., Maedgen & Carlson, 2000). Presumably, showing frustration or anger in the presence of an experimenter was considered inappropriate to context and therefore ineffective emotion regulation. However, it is not entirely clear how this nonverbal behavior can be construed as a problem in emotion regulation. Indeed, measuring only one component of emotion, nonverbal behavior, does not allow for unambiguous conclusions about emotion versus emotion regulation. Why is a child who displays frustration considered to have a problem in emotion regulation compared to a child who feels no frustration at all? The answer to this question cannot be ascertained without looking at the relationship between experience and expression.¹ To be sure, assessing emotional experience among children is not as straightforward as it is among adults. Nevertheless, inferences about emotion regulation are difficult to make when only one component of emotion is assessed.

Rather than inferring a problem in emotion regulation, findings from basic research on emotion regulation can be used to help clarify the nature of an observed emotion disturbance in different psychological disorders. For example, of the more replicable findings in schizophrenia is that patients are markedly less expressive than individuals without schizophrenia (e.g., Berenbaum & Oltmanns, 1992; Kring & Earnst, 1999; Kring, Kerr, Smith, & Neale, 1993; Kring & Neale, 1996). Recent research on emotion regulation provides important clues as to whether schizophrenia patients' diminished expressive behavior reflects a disturbance in emotion or an emotion regulation strategy that may be employed too often. Work by Gross and colleagues (e.g., Gross & Levenson, 1993, 1997) has demonstrated that one form of emotion regulation, suppressing the expression of an ongoing feeling, is linked to increases in autonomic nervous system (ANS) activity. In schizophrenia, finding that patients' diminished expressivity is associated with heightened ANS activity would suggest that patients are employing an emotion regulation strategy (suppression). By contrast, finding that their diminished expressive display is not linked to such an ANS increase would suggest a problem in emotion expression. The evidence to date favors the latter scenario: schizophrenia

patients' diminished expressive behavior is not reliably associated with increases in ANS activity (Kring et al., 2003; Kring & Neale, 1996). These brief examples illustrate both the promise and difficulties associated with distinguishing emotion from emotion regulation. One further definitional issue to be considered is the distinction between emotion dysregulation and emotion regulation.

Defining Emotion Dysregulation

Trying to distinguish emotion regulation from dysregulation is a bit like trying to distinguish normal from abnormal or disorder from nondisorder. It seems likely that emotion dysregulation involves both a deficiency in regulatory processes as well as maladaptive implementation of otherwise intact processes.

Cicchetti et al. (1995) distinguished emotion dysregulation from problems in emotion regulation. According to these authors, emotion dysregulation involves the inappropriate or maladaptive application of emotion regulatory processes that are nevertheless present and available for appropriate use. By contrast, problems in emotion regulation reflect the absence of, or deficits in, regulatory processes. To illustrate with a simple example, an individual who is able to suppress an emotional display but does so toward maladaptive ends (e.g., to lie) would be considered to be exhibiting emotion dysregulation. An individual who has failed to learn to suppress an emotional display would be exhibiting a problem in emotion regulation. By this account, emotion dysregulation emphasizes functional impairments or maladaptive outcomes associated with the implementation of emotion regulatory processes; problems in emotion regulation reflect a more fundamental disturbance in the building blocks of emotion regulatory processes. Although this may not necessarily be the way nature has carved the emotion regulatory joints, it is nonetheless a useful rubric for considering emotion regulation in psychopathology. Furthermore, this approach suggests that basic emotion regulatory processes must be understood before either dysregulation or problems in emotion regulation can be fully understood. Thus, research from basic emotion that attempts to unpack the nature of emotion regulatory processes will be wholly informative with respect to understanding the role of emotion regulation (or dysregulation) in psychopathology. Moreover, distinguishing whether regulatory processes are deficient or employed during inopportune moments or situations has enormous implications for treatment. Working to develop a regulatory strategy would require a different intervention than would working to match situations with regulatory strategies already at one's disposal.

Adopting a somewhat different approach, Keenan (2000) articulated a number of important considerations for definitions of emotion dysregulation. First, she noted that many component behaviors used to define emotion regulation, particularly among children (e.g., crying, increases in heart rate), are typical behaviors. Emotion dysregulation, according to Keenan, reflects a repeated pattern of these behaviors across time and in extreme form. By this account, emotion regulation

and dysregulation form a type of continuum, ranging from regulatory processes and behaviors implemented in appropriate contexts to these same processes used ineffectively and out of context. Indeed, context plays a central role in distinguishing regulation and dysregulation according to this view. Furthermore, outcomes associated with regulatory processes are also emphasized in Keenan's conceptualization, particularly the level of impairment associated with the implementation of any given regulatory process. Not surprisingly, impairments in functioning are central to several conceptualizations of emotion dysregulation (e.g., Cole et al., 1994; Gross & Munoz, 1995; Thompson, 1994), much the same way that impairment in functioning figures into definitions of mental disorder (e.g., DSM-IV-TR; Wakefield, 1992). Finally, Keenan emphasized the importance of considering multiple regulatory components (behavior, experience, physiology, social) and that emotion dysregulation likely involves disruptions to more than one component. Keenan's account consisted of three considerations: (a) Emotion dysregulation consists of behaviors and processes that are part of the "normal" spectrum, but they are exhibited frequently, out of context, or in extreme form; (b) emotion dysregulation is associated with an impairment in functioning; and (c) emotion dysregulation involves disturbances in multiple regulatory components. The first consideration again requires knowledge of basic emotion regulatory processes to help determine when they are out of context and when they are too frequent or extreme.

EMOTION REGULATION AND PSYCHOPATHOLOGY?

What type of evidence is available for examining whether emotion regulatory processes are disturbed or absent in different psychological disorders? There is a rich accumulation of clinical case descriptions of various disorders that provides hints at regulatory problems. Furthermore, some of the diagnostic criteria explicitly refer to emotion regulation difficulties. For example, the criteria "difficulty controlling anger" in Borderline Personality Disorder; "efforts to avoid feelings" in Posttraumatic Stress Disorder (PTSD); "difficulty controlling worry" in Generalized Anxiety Disorder; and "rapidly shifting expressions of emotion" in Histrionic Personality Disorder, all suggest difficulties in regulating emotions. Although this descriptive information sets the stage for further empirical investigation, these descriptions alone do not provide overwhelming evidence for emotion regulation problems in different psychological disorders.

Based on our earlier discussion of emotion dysregulation, it would seem that to establish whether emotion dysregulation is a part of various psychological disorders, we must (a) delineate some of the basic processes comprising emotion regulation, and (b) demonstrate that the use of (or failure to use) emotion regulatory processes is associated with an impairment in functioning. Although we know that most psychological disorders are associated with impaired functioning, empirical

work that links these impairments to emotion regulatory problems as opposed to other deficits associated with a particular disorder remains to be conducted.

What are the basic processes associated with emotion regulation? At the broadest level, emotion regulation involves processes that not only serve to regulate emotion, but also serve other important self-regulatory functions. For example, psychological processes, such as attention, working memory, decision making, social skill, and emotion knowledge, to name but a few, all likely figure in the successful regulation of emotion (e.g., Cicchetti et al., 1995; Cole et al., 1994; Davidson, 2000; Derryberry & Reed, 1996; Feldman Barrett & Gross, 2001; Gross, 1998, 2001). Furthermore, neurobiological structures and pathways, including neurotransmitters, neuroendocrine systems, and cortical and subcortical structures, also figure prominently in emotion and emotion regulation (e.g., Davidson, 2000; Gross, 1998; LeDoux, 1996; Panksepp, 1998). To consider the role of these multiple levels is well beyond the scope of this chapter. Furthermore, that these different psychological processes and neurobiological systems are involved in emotion regulation as well as other important self-regulatory, emotional, behavioral, and cognitive functions makes uncovering their specific contribution to emotion regulation undeniably challenging.

Berenbaum et al. (2003) has proposed a taxonomy of emotional disturbances in psychopathology, which includes what they call *emotional intensity/regulation disturbances*. Emotional intensity/regulation disturbances are defined as excesses or deficits in both positive and negative emotions. For example, mania characterized by excesses in both positive (joy, euphoria) and negative (irritability) emotions would be construed as an emotional intensity/regulation disturbance. Unfortunately, this conceptualization does not articulate the regulatory processes that are either missing, gone awry, or linked to maladaptive outcomes. What is needed to more firmly establish a link between emotion regulatory problems and psychological disorders is an empirical strategy that articulates hypotheses specific to emotion regulatory processes.

To begin to examine how emotion regulatory processes may figure into different psychological disorders, we have adopted Gross's (1998) process model of emotion regulation. This model articulates a number of emotion regulatory processes or strategies which are situated along the temporal unfolding of an emotion. Gross has distinguished regulatory processes that occur before an emotion is generated (labeled *antecedent-focused*) from those processes that occur after an emotion is generated (labeled *response-focused*). Table 14.2 presents the antecedent-focused and response-focused processes or strategies outlined by Gross.

This model holds great promise for examining the role of emotion regulation in psychopathology in at least three ways. First, work by Gross and colleagues has begun to uncover the mechanisms and outcomes of two forms of emotion regulation, one antecedent-focused (reappraisal) and one response-focused (suppression; for a review, see Butler & Gross, this volume). To briefly summarize, reappraising, a form of cognitive change, is associated with decreases in expres-

TABLE 14.2

Antecedent- and Response-Focused Emotion Regulation Strategies

	<i>Strategy</i>	<i>Description</i>
Antecedent-Focused strategies (before an emotion is generated)	Situation Selection	Choosing among situations
	Situation Modification	Changing aspects of the situation, once in it
	Attention Deployment	Focusing attention on a particular aspect of a situation
	Cognitive Change	Altering the meaning associated with the aspect of the situation
Response-Focused strategies (after an emotion is generated)	Response Modulation	Altering the expression, experience, or physiology of an emotional response

Note. Adapted from Gross's (1998) process model of emotion regulation.

ive behavior, emotional experience, but no detrimental physiological consequences. By contrast, suppression is associated with decreases in expressive behavior, no changes in emotional experience, heightened physiological responding, impaired memory, and interference with social interactions. These findings can help to illuminate whether emotion disturbances in psychopathology may be construed as problems in emotion regulation. In addition, the laboratory work by Gross and colleagues has laid the methodological foundation for future studies that will illuminate the precursors and outcomes of different emotion regulatory processes in both disordered and nondisordered populations. Second, indirect evidence from other areas of psychopathology research can be used to support the possibility that emotion regulatory processes, such as situation selection or attention deployment, may be disrupted in various psychological disorders. For example, one of the more replicable findings in the anxiety literature is the finding that anxious individuals tend to focus their attention on anxiety or threat-related information (e.g., Mathews & MacLeod, 1994). Third, some of the observed emotion disturbances in psychopathology may be construed as an additional response-focused emotion regulation strategy not currently included in Gross's (1998) model. For example, the failure to inhibit an ongoing emotion has been hypothesized to be a central deficit in depression (e.g., Tomarken & Keener, 1998). The failure to stop or down-regulate an emotion is likely a response modulation problem. Of course, the empirical work needed to constrain hypotheses about other antecedent-focused and response modulation problems in psychopathology remains to be done.

In the next section, we draw on the promise of this model to examine how emotion regulation difficulties may characterize a number of different psychological

disorders. Unfortunately, given the state of the field, most of the ideas about emotion regulation and psychopathology we outline have yet to be empirically verified. Thus, much of what we present is a framework for future research. However, we believe that adopting this process model approach has tremendous potential for testing hypotheses about how emotion regulation is (or is not) linked to different psychological disorders.

EMOTION REGULATION AND SPECIFIC PSYCHOLOGICAL DISORDERS

To consider the question of how emotion regulation (or dysregulation) figures into all of the DSM-IV-TR disorders with emotional symptoms (cf. Table 14.1) would be worthy of an entire book. Here, we focus on a subset of those disorders, particularly those that have accumulated evidence of specific emotion-related disturbances.

Major Depressive Disorder

Prolonged sad or depressed mood and loss of interest or pleasure (anhedonia) are two emotional features associated with major depressive disorder. Anxiety and guilt are also commonly part of the emotional landscape of this disorder (Mineka, Watson, & Clark, 1998). Moreover, depression has been broadly characterized by low levels of positive affect and heightened levels of negative affect (e.g., Watson, Clark, & Carey, 1988). Persons with low levels of positive affect are likely to experience emotions such as sadness and to be interpersonally disengaged. By contrast, persons with high levels of negative affect are likely to frequently experience emotions such as anxiety, guilt, and anger.

Recent empirical work has linked this pattern of heightened negative affect and low levels of positive affect to asymmetrical patterns of electrocortical activation in frontal cortex. Resting left frontal hypoactivation has been observed in both currently depressed (e.g., Henriques & Davidson, 1991) and previously but not currently depressed individuals (Henriques & Davidson, 1990). In contrast, greater relative left anterior hyperactivation has been observed in individuals reporting high levels of positive affectivity and thus presumably not prone to major depressive disorder (Tomarken, Davidson, Wheeler, & Doss, 1992). Researchers have proposed that stable, resting left frontal hypoactivation is a diathesis for depression that is linked to a number of emotion-related deficits (e.g., Davidson, 1992; Davidson & Tomarken, 1989; Henriques & Davidson, 1990; Tomarken & Keener, 1998). A number of these emotion-related deficits can be construed as antecedent- and response-focused emotion regulatory deficits, such as the relative incapacity to respond to positive emotional stimuli (antecedent-focused), the prolonged maintenance of negative affect (response-focused), and deficits in the capacity to

use positive events to shift into positive emotional states (antecedent-focused). What is needed are investigations that examine emotional responding in depression as well as the capacity to implement antecedent- and response-focused emotion regulatory strategies. Findings from studies that have assessed multiple components of emotional response suggest that depressed patients exhibit dampened expressive behavior to positive stimuli, and in some cases, dampened experience to both positive and negative emotional stimuli (e.g., Berenbaum & Oltmanns, 1992; Rottenberg, Gross, Wilhelm, Najmi, & Gotlib, 2002; Rottenberg, Kasch, Gross, & Gotlib, 2002; Sloan, Strauss, & Wisner, 2001; Ulrich & Harms, 1985; Waxer, 1974). Extension of these findings into studies of specific emotion regulation processes is still needed.

Accumulated evidence indicates that depression is also linked with a number of cognitive biases in the processing of emotional stimuli, including a memory bias for mood-congruent information (e.g., Bradley, Mogg, & Williams, 1995), attentional biases toward mood-congruent information (e.g., MacLeod & Mathews, 1991), and self-focused rumination (e.g., Nolen-Hoeksema & Morrow, 1993), to name but a few. Furthermore, these cognitive and attentional biases and distortions have been hypothesized to contribute to the maintenance of depressed mood (e.g., Tomarken & Keener, 1998). To the extent that these processes are also antecedent-focused emotion regulatory strategies, it may be the case that individuals with depression have difficulty regulating negative emotions once they have already begun. Although the extant empirical work remains to be done, we can hypothesize that depressed individuals may have difficulties in situation selection, attention deployment, and cognitive change, all antecedent-focused regulatory strategies.

Bipolar Disorder

One of the features that distinguish bipolar disorder from major depressive disorder is the presence of at least one manic episode. Indeed, an episode of depression is not even required for the diagnosis, and as many as a third of bipolar patients report only manic episodes (e.g., Kessler et al., 1997). Although an episode of mania can involve high levels of positive emotions such as euphoria, it can also involve high levels of irritability. Furthermore, manic episodes can also include symptoms of depression (Johnson & Kizer, *in press*). Perhaps not surprisingly, bipolar patients appear to have more intense positive emotional experiences than unipolar patients (e.g., Bagby et al., 1996). However, bipolar patients who experience depression demonstrate increased levels of negative affect, similar to patients with unipolar depression (Lozano & Johnson, 2001).

Although research is beginning to characterize the nature of disturbances in emotional experience in Bipolar Disorder, there is still much to be learned about expressive behavior and physiological reactivity. Furthermore, there has yet to be

a direct study of emotion regulation among bipolar patients. As discussed earlier, additional research is needed to ascertain whether the prolonged and intense positive and negative emotional experience of bipolar patients reflects an inability to down-regulate their emotional responses (i.e., a response-focused emotion regulation problem). A laboratory investigation that sought to test whether bipolar patients could influence their feelings, expressive behavior, and physiological arousal when presented with emotional stimuli, would go a long way toward discovering potential emotion regulation problems.

Indirect evidence suggests that emotion regulatory processes may aid in recovery. In a prospective study of bipolar patients, Johnson and colleagues (Johnson, Winett, Meyer, Greenhouse, & Miller, 1999) found that social support predicted a more rapid recovery, as well as a decrease in depressive symptoms, but not manic symptoms. To the extent that social support serves as an external regulator of emotion, this finding suggests that social support may be an effective external emotion regulator that works toward decreasing the prolonged sad or depressed mood in depression episodes, whether part of Major Depressive Disorder or Bipolar Disorder.

Schizophrenia

As noted earlier, accumulated evidence indicates that schizophrenia patients are markedly less expressive than individuals without schizophrenia. This diminished expressive behavior is not accompanied, however, by a corresponding decrement in experienced emotion (e.g., Berenbaum & Oltmanns, 1992; Kring & Earnst, 1999; Kring et al., 1993; Kring & Neale, 1996). Moreover, although one study has found that schizophrenia patients exhibit heightened ANS reactivity in response to emotional stimuli, this increase is not specific to emotional stimuli (Kring & Neale, 1996), and this more generalized heightened reactivity is seen only among a subgroup of schizophrenia patients (Kring et al., 2003). As noted earlier, one form of response-focused emotion regulation, suppression of expressive behavior, is associated with greater ANS reactivity. Thus, the accumulated findings to date on diminished expressivity in schizophrenia do not suggest that schizophrenia patients are down-regulating (suppressing) their emotions. However, might it be the case that schizophrenia patients have a deficit in up-regulation? That is, might their diminished expressive behavior be a failure (or inability) to summon the expressive component of emotion in a manner commensurate with other emotion components? This possibility remains to be tested empirically. A study could be fashioned that asks patients to magnify their display of feelings in an effort to see if patients can indeed produce outwardly observable displays of experienced emotion. An inability to do so would suggest a problem in emotion regulation insofar as matching expression with experience is construed as a form of response-focused emotion regulation. To date, there is no evidence to suggest that schizophrenia patients have a deficit or lack of antecedent-focused regulatory

strategies, however, this lack of evidence stems largely from a lack of research into this area. Additional studies that examined whether schizophrenia patients are able to reappraise, one form of cognitive-change proposed by Gross's (1998) model that has been investigated among nondisordered individuals, would be a good place to begin.

Feldman Barrett and Gross (2001) have argued that knowledge and awareness of one's emotions are a necessary prerequisite to effective emotion regulation. However, simply having knowledge about emotion is not sufficient. Rather, greater accessibility of that emotion knowledge is believed to promote effective emotion regulation. Individuals who describe their feelings in a more differentiated manner (e.g., sad, confused, elated) rather than more globally (e.g., good, bad) have greater accessibility to and awareness of emotion knowledge and use this knowledge in a more specific way. This ability to differentiate among emotional states is believed to provide individuals with information about when the regulation of emotion may be necessary. Feldman Barrett, Gross, and colleagues hypothesized and later empirically confirmed that greater emotion awareness and differentiation is linked with emotion regulation capability, particularly for negative emotions (Feldman Barrett, Gross, Christensen, & Benvenuto, 2001). In the schizophrenia literature, recent evidence indicates that schizophrenia patients do not appear to differ from individuals without schizophrenia in terms of their emotion knowledge. However, schizophrenia patients appear to differentiate less among emotional states, and thus may be less effective at emotion regulation (Kring et al., *in press*).

Anxiety Disorders

Although the anxiety disorders are a heterogeneous group of disorders, most, if not all of them involve heightened negative affect more generally and fear, anxiety, and disgust more specifically (e.g., Chorpita & Barlow, 1998; Clark & Watson, 1991; Watson et al., 1995; Zinbarg & Barlow, 1996). One common clinical feature that many of the anxiety disorders share is recognition that the anxiety, worry, or fear is excessive, as well as a relative inability to modify or stop these feelings. Furthermore, among individuals with anxiety disorders, the presence of negative emotions is not dysfunctional *per se*. For example, the fear response that characterizes a panic attack is an otherwise normal or functionally adaptive response that occurs at an inappropriate time (Barlow, 2001). That the clinical features common to a number of anxiety disorders indicate difficulties in the modification and timing of anxiety-related emotions suggests that a problem in emotion regulation may be centrally relevant.

Indirect evidence supports the proposition that individuals with anxiety disorders may have problems with antecedent-focused emotion regulation. For example, a number of studies have found that panic disorder patients misperceive harmless events or objects in the environment as threatening (Barlow, 2001; Clark,

1988; McNally, 1990). In addition, cumulative evidence suggests that anxious patients are more likely to attend to threatening stimuli and make biased judgments about the likelihood of negative outcomes as well as the covariation between these outcomes and feared stimuli (Mathews & MacLeod, 1994; Mineka & Sutton, 1992; Tomarken, Mineka, & Cook, 1989; Tomarken, Sutton, & Mineka, 1995). These findings suggest that anxious patients may have difficulties in situation selection, attention deployment, and cognitive change, although empirical work is needed to test out these notions.

One of the clinical characteristics associated with PTSD is emotional numbing, which refers to patients' general restriction of feelings, particularly when reminded of or reexposed to trauma.² Recent empirical work by Litz and colleagues has demonstrated that PTSD patients do not have an overall dampening of feelings when cued with prior trauma. Rather, PTSD patients exhibit a dampening of positive expressive behavior in response to positive stimuli (e.g., Litz, Orsillo, Kaloupek, & Weathers, 2000). Litz and colleagues have suggested that this dampening of positive facial expressions reflects automatic emotional suppression, perhaps as a means of coping with the trauma reexposure (Litz & Gray, 2002; Litz et al., 2000). Borrowing from the findings of Gross and Levenson (1997), suppression in response to positive stimuli would be expected to be accompanied by an increase in ANS reactivity. Findings from Litz et al. (2000) indicated that PTSD patients had greater heart rate reactivity to all stimuli, regardless of whether they were exposed to prior trauma. Thus, it remains unclear whether PTSD patients are actually suppressing in this context. Evidence from a self-report study suggests, however, that PTSD patients do indeed suppress their emotional reactions. Combat veterans with PTSD reported that they were more likely to deliberately keep their feelings hidden from others than combat veterans without PTSD (Roemer, Litz, Orsillo, & Wagner, 2001). Additional research that asks PTSD patients to suppress their outward expressions in response to emotional stimuli and assesses expressive behavior, experience, and ANS reactivity would be informative.

Importantly, these findings point to the importance of considering context when developing hypotheses about emotion regulation and psychopathology. Indeed, Litz and Gray (2002) have argued that exposing combat veterans to combat-related images differentially impacts emotional responding by heightening attention to threat and thereby raising the threshold required to emotionally respond to positive stimuli. Thus, emotion regulatory problems are likely to be apparent when cues to trauma are readily available.

Borderline Personality Disorder

Many of the clinical characteristics associated with Borderline Personality Disorder (BPD) can be viewed as quintessential emotion regulation problems. Clinically, these emotion regulation problems have been described in various ways, including an oversensitivity to emotional events, an instability in affective

response, excessive fluctuations in mood and emotional response, and a failure to return to "baseline" following an emotional event (e.g., Farchaus-Stein, 1996; Levine, Marziali, & Hood, 1997; Linehan, 1987; Lumsden, 1993; Snyder & Pitt, 1985). As noted earlier and in Table 14.1, several of the DSM-IV-TR criteria for BPD involve emotion, and suggest difficulty with response-focused emotion regulation. Recent research has found that BPD patients report chronic and intense feelings of a number of negative emotions, including anger, hostility, depression, loneliness, and anxiety (e.g., Coid, 1993; Farchaus-Stein, 1996; Gunderson, Carter, & Strauss, 1975; Gunderson & Phillips, 1991; Kruegelbach, McCormick, Schultz, & Grueneich, 1993; Snyder & Pitt, 1985; Soloff, 1981; Soloff & Ulrich, 1981). Furthermore, a daily diary study found that not only do BPD patients report greater negative emotion than individuals without BPD, they also exhibit greater variability in their daily negative emotion (Farchaus-Stein, 1996). Thus, not only do patients with BPD report experiencing more negative emotion than controls, their negative emotions are also much more variable (see also Cowdry, Gardner, O'Leary, Liebenluft, & Rubinow, 1991). Theorists have suggested that BPD patients exhibit a number of emotion-related maladaptive behaviors, such as suicidal gestures, aggression, avoidance, overreacting, and other impulsive acts in an attempt to regulate these strong negative emotions (e.g., Linehan, 1987; Paris, 1992; Shearin & Linehan, 1994).

A recent and comprehensive study on emotion disturbances in BPD found that compared to nonpatients, BPD patients were less aware of their own and others' emotions, had fewer empathetic responses, reported more intense negative but not positive emotions, and performed more poorly on a test of facial emotion perception (Levine et al., 1997). That BPD patients are less aware of their own emotions suggests that they will regulate their emotions less often, because as noted earlier, emotional awareness is an important prerequisite for regulation of emotion (cf. Feldman Barrett et al., 2001). Interventions that aim to increase emotional awareness among BPD patients may therefore hold great promise toward increasing emotion regulation capabilities.

Frontotemporal Lobar Dementia

Frontotemporal lobar dementia (FTLD) is characterized by a decline in social conduct, impaired regulation of behavior, emotional blunting, low motivation, and loss of insight (Neary et al., 1998). The neuronal deterioration of FTLD occurs predominantly in the amygdala, anterior temporal lobes, and prefrontal cortex (Miller, Ikonte, Ponton, & Levy, 1997). In perhaps one of the most comprehensive examinations of emotion in FTLD, Levenson and colleagues have embarked on an ambitious program of research whereby they are testing emotional reactivity and emotion regulation capabilities in FTLD patients and a comparable sample of individuals without FTLD. Although preliminary, findings to date indicate that FTLD patients exhibit comparable facial expression, experience, and physiology in re-

sponse to emotionally evocative material. However, when asked to suppress their outward reactions to these stimuli, FTLD patients have difficulty in doing so (Werner et al., 2003). Furthermore, when control participants are told that a loud "gun-shot like" noise will occur in 10 sec, they "brace" themselves both physiologically and psychologically. This bracing is manifested by a reduction in somatic activity and limited facial movement. These efforts could be construed as an antecedent-focused emotion regulatory process, insofar as these individuals are likely deploying their attention elsewhere and focusing inward to prepare for the impending loud noise. By contrast, FTLD patients do not appear to exhibit such antecedent-focused emotion regulation in the face of an unwarned noxious stimulus (Levenson, 2001). Thus, FTLD patients may have a deficit in both response-focused and antecedent-focused emotion regulation yet no deficit in emotional reactivity. These findings point to the importance of distinguishing emotion from emotion regulation.

IMPLICATIONS FOR ASSESSMENT AND TREATMENT

Although it might seem a bit premature to discuss implications because the empirical findings on emotion regulation difficulties in psychological disorders are so few in number, we chose to do so because we believe the implications are enormous. Broadly speaking, greater dissemination of laboratory-based findings on emotion and psychopathology to clinicians is needed. Empirical evidence has disconfirmed some commonly held clinical notions, thus changing the way assessment and treatment may be approached. For example, the term *flat affect* implies that all of emotion is dampened, and this was presumed by many to be the case in schizophrenia. However, laboratory findings that schizophrenia patients experience strong emotions despite their lack of outward display (see Kring, 1999, for a review), coupled with findings that schizophrenia patients do not have a marked deficit in the ways in which they represent their emotions (Kring, Feldman, Barrett, & Gard, 2003), suggest a shift in treatment and assessment goals is needed. In other words, interventions aimed at increasing patients' awareness of their emotions are likely misdirected. Rather, interventions targeted toward increasing expressive behavior, as is often done in psychosocial interventions emphasizing social skills, will likely be more fruitful. Indeed, an important component of social skills interventions for schizophrenic patients is the development of nonverbal and emotion-related behaviors (e.g., Liberman, DeRisi, & Mueser, 1989; Mueser & Sayers, 1992).

Similarly, the concept of emotional numbing in PTSD was associated with the belief that patients experienced widespread deficits in experienced emotion. Laboratory research suggests that emotional numbing is much more context and valence specific, such that PTSD patients exhibit a diminution of positive expressive behavior after being exposed to or primed with prior trauma cues (Litz et al., 2000). Thus, interventions targeted toward increasing positive expressive behav-

ior will likely be more advantageous than interventions that seek to increase patients' feelings more generally.

Findings specific to emotion regulation in psychological disorders suggest a number of important assessment and treatment implications. First, creating assessment instruments to measure antecedent-focused and response-focused regulation strategies would be a tremendous asset for clinicians. For example, we have speculated that individuals with depression and anxiety may have difficulties with situation selection, attention deployment, and cognitive change. The development and validation of a self-report measure that assesses the use of these different processes across varied contexts would be an important tool that can be used to test these notions.

In the absence of a measure to tap emotion regulatory processes, simply asking patients about their regulatory efforts as part of a routine assessment can provide a tremendous amount of clinically useful information. Roemer et al. (2001) found that combat veterans with PTSD reported more frequent and intense bouts of withholding their emotional displays than combat veterans without PTSD. This finding indicates that PTSD patients are actively employing regulatory efforts, and that they are aware that they do so. Asking these questions of other patient populations may yield information indicating an inability or unawareness of emotion regulatory efforts.

More generally, including a weekly assessment of emotion experience or expression in the context of therapy, and then charting these reports, can also provide clinically useful information (e.g., Persons, Davidson, & Tompkins, 2001). This can provide a closer look at the variability of emotion so prominent in BPD. It could also serve to increase awareness of emotion and failed regulatory attempts during a given week. These weekly reports are not only useful with respect to assessment, but they could also serve as valuable points of intervention.

CONCLUSIONS AND DIRECTIONS

Emotion disturbances are very common in psychopathology, and research over the last several decades has more clearly specified the nature of these disturbances (for reviews, see Berenbaum et al., in press; Keltner & Kring, 1998; Kring, 2001; Kring & Bachorowski, 1999). However, the extent to which emotion regulation problems play a role in various disorders is less well understood. Advances in basic research on emotion regulation hold promise for illuminating how emotion regulation difficulties may or may not characterize different types of psychopathology. Yet, before this promise can be fully realized, we believe that a number of conceptual and empirical issues must first be addressed. For example, resolving the definitional ambiguity surrounding the concept of emotion regulation will help to constrain hypotheses and theories about how and when emotion regulatory processes may go awry.

We have suggested that adopting the process model of Gross (1998) is a fruitful way to begin to delineate emotion regulatory deficits in psychopathology. This model can guide interpretation of existing findings on emotion disturbance as well as suggest new directions and methods for addressing emotion regulation in psychopathology. Findings on emotion regulation disturbances in psychopathology can in turn contribute toward bolstering the model. Indeed, evidence of emotion disturbances in various disorders suggests a form of response-focused emotion regulation not currently captured in the model. For example, the prolonged maintenance of emotional states characterizes mood disorders and suggests a difficulty in "shutting off" a response once it has been initiated.

There are a number of important directions for future research. First, basic research to further delineate the mechanisms and outcomes of emotion regulatory processes among nondisordered individuals needs to be done. We are just beginning to understand the characteristics of two forms of emotion regulation: suppression and reappraisal (Gross, 2002). It will be important to investigate the consequences of other forms of antecedent- and response-focused emotion regulatory strategies. These findings can then aid our understanding of how emotion dysregulation may figure into various psychological disorders. It will also be important to further characterize the adaptive value of different emotion regulatory strategies. For example, under what conditions is it adaptive to suppress?

An additionally important direction is to consider contextual variables in emotion regulatory models. For example, the role of gender has not been fully investigated with respect to emotion regulation. Findings among adults suggest that men and women do not differ in their emotion regulation efforts (e.g., Gross & Levenson, 1993, 1997). However, gender differences are the rule more often than the exception within psychopathology. Might it be the case that some of the gender differences in psychopathology can be accounted for by differences in emotion regulation? In its current form, Gross's (1998) model does not account for emotion regulatory strategies being appropriate in some contexts, and not in others. Expanding the model across and within different contexts is a necessary next step for the study of emotion regulation among disordered and nondisordered individuals.

Indeed, although we believe that Gross's (1995) emotion regulation model represents a good place to begin to examine emotion regulation strategies in depression, the model is not without shortcomings. For example, the model does not account for the role of other people as emotion regulators. Yet, understanding the interaction between, for example, depressed and anxious persons with other people will undeniably be important for understanding emotion regulation in these disorders.

Recent studies on emotion and psychopathology have incorporated methods developed and validated in the basic emotion literature. For instance, findings from studies of depression, schizophrenia, and PTSD that have included measures of multiple emotion components have advanced our understanding of emotion dis-

turbances in these disorders well beyond what studies incorporating only one component of emotion have done (e.g., Kring & Earnst, 1999; Litz et al., 2000; Rottenberg et al., 2002). In the same way, incorporating the methods for studying emotion regulation will be fruitful.

Moreover, a combination of both laboratory and naturalistic research will likely yield the most complete picture of emotion regulation disturbances in psychopathology. For example, laboratory findings of diminished positive expressive behavior among PTSD patients have been confirmed in studies assessing patients' use of regulatory strategies in daily life (e.g., Litz et al., 2000; Roemer et al., 2001). Combining these approaches with more traditional clinical interviews will undoubtedly illuminate a richer account of how emotion regulation does or does not play a role in various forms of psychopathology.

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ENDNOTES

¹In the Maedgen & Carlson (2000) study, children were asked to report how they felt in the nondisappointing and disappointing conditions; however, these data were not included in the report.

²Emotional numbing suffers from a similar definitional ambiguity that plagues emotion regulation research. For a discussion of the issues associated with emotional numbing and PTSD, see Litz & Gray (2002).

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