

Emotion Regulation as a Mechanism of Change in Acceptance- and Mindfulness-based  
Treatments

Kim L. Gratz and Matthew T. Tull

University of Mississippi Medical Center

*Author Note.* Correspondence concerning this article should be addressed to Kim L. Gratz, Ph.D., Department of Psychiatry and Human Behavior, University of Mississippi Medical Center, 2500 North State Street, Jackson, Mississippi 39216, USA. Phone: 601-815-6540; Fax: 601-984-5842; Email: KLGratz@aol.com.

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## Emotion Regulation as a Mechanism of Change in Acceptance- and Mindfulness-based Treatments

Over the past decade, increasing attention has been paid to emotion regulation as a potentially unifying function of diverse symptom presentations, and growing evidence suggests that difficulties in emotion regulation underlie many of the clinically relevant behaviors and psychological difficulties for which clients seek treatment, including deliberate self-harm (e.g., Gratz & Chapman, 2007; Gratz & Roemer, 2008), substance use (e.g., Fox, Axelrod, Paliwal, Sleeper, & Sinha, 2007; Fox, Hong, & Sinha, 2008), binge eating (e.g., Leahey, Crowther, & Irwin, 2008; Whiteside, Chen, Neighbors, Hunter, Lo, & Larimer, 2007), depression and anxiety (Roemer et al., in press; Tull, Stipelman, Salters-Pedneault, & Gratz, 2009; Vujanovic, Zvolensky, & Bernstein, 2008), worry (Salters-Pedneault, Roemer, Tull, Rucker, & Mennin, 2006; Vujanovic et al., 2008), generalized anxiety disorder (Mennin, Heimberg, Turk, & Fresco, 2005; Roemer et al., in press; Salters-Pedneault et al., 2006), posttraumatic stress disorder (McDermott, Tull, Gratz, Daughters, & Lejuez, in press; Tull, Barrett, McMillan, & Roemer, 2007), and borderline personality disorder (Gratz, Rosenthal, Tull, Lejuez, & Gunderson, 2006). In response, treatments for a variety of difficulties are increasingly incorporating a focus on emotion regulation and seeking to promote adaptive emotion regulation skills (Gratz & Gunderson, 2006; Linehan, 1993; Mennin, 2006).

Yet, despite the interest in emotion regulation as a mechanism underlying various forms of psychopathology and important target of treatment, there is no consistent or agreed upon definition of this construct (see Putnam & Silk, 2005), and there remains a great deal of disagreement regarding the definition that is most clinically-relevant. However, clinical applications of the emerging research on the role of emotion dysregulation in various

psychological difficulties require an understanding of the precise conceptualization of emotion regulation that is most applicable to these difficulties. Thus, the following section describes extant approaches to the conceptualization of emotion regulation, and seeks to clarify the conceptualization of emotion regulation that may be most clinically useful (particularly with regard to the development of new interventions and modification of existing interventions).

### *Extant Conceptualizations of Emotion Regulation*

Although numerous conceptual definitions of emotion regulation exist currently, there are two particular areas of disagreement that are most relevant to developing a clinically-useful definition of emotion regulation.

*Control of emotions vs. control of behavior when experiencing emotions.* First, there is a great deal of disagreement as to whether emotion regulation refers to the control of negative emotions or the control of behavior when experiencing negative emotions. Specifically, one approach has been to equate emotion regulation with the control and reduction of negative emotions (e.g., Kopp, 1989; Zeman & Garber, 1996), implying that experiencing negative emotions is a sign of emotion dysregulation. Although the assumption that negative emotions are disruptive, problematic, and/or should be carefully controlled is widespread in psychology (and throughout our society as a whole), recent research is providing evidence that efforts to control negative emotions may not always be effective or healthy. For example, there has been a great deal of research in the past decade indicating that efforts to control, suppress, or avoid unwanted internal experiences (including emotions) may actually have paradoxical effects, increasing the frequency, severity, and accessibility of these experiences (see Hayes, Luoma, Bond, Masuda, & Lillis, 2006; Salters-Pedneault, Tull, & Roemer, 2004). The classic studies in this area focused on thought suppression (i.e., deliberately trying not to think about something), and involved

instructing study participants not to think of a white bear (Wegner, Schneider, Carter, & White, 1987). These studies provided the first experimental evidence that attempts to avoid or suppress internal experiences may actually have paradoxical effects (referred to as ironic processes; Wegner, 1994). More recently, though, researchers have extended this line of inquiry to emotions and found similar results (for a review, see Salters-Pedneault et al., 2004). All in all, these findings suggest that conceptualizations of emotion regulation that equate regulation with the control or avoidance of certain emotions may confound processes that undermine regulation with those that promote emotion regulation.

More consistent with the findings of this research, another approach to emotion regulation emphasizes the functionality of all emotions (see Cole, Michel, & Teti, 1994; Thompson & Calkins, 1996) and suggests that adaptive emotion regulation involves the ability to control one's behaviors (e.g., by inhibiting impulsive behaviors and/or engaging in goal-directed behaviors) when experiencing negative emotions, rather than the ability to directly control one's emotions themselves (see Linehan, 1993; Melnick & Hinshaw, 2000). This approach distinguishes emotion regulation from emotional control and, instead, defines regulation as the control of behavior in the face of emotional distress. According to this approach, although adaptive regulation may involve efforts to modulate the intensity or duration of an emotion (Thompson, 1994; Thompson & Calkins, 1996), these efforts are in the service of reducing the urgency associated with the emotion in order to control one's *behavior* (rather than the emotion itself). In other words, this approach suggests the potential utility of efforts to "take the edge off" an emotion or self-soothe when distressed, provided that the individual is not attempting to get rid of the emotion or escape it altogether. Moreover, when it comes to efforts to modulate the intensity or duration of an emotion, attachment to the outcome of these efforts is thought to have

paradoxical effects (as directly trying to reduce emotional arousal to a particular level or make an emotion end after a certain amount of time is considered to reflect an “emotional control” agenda indicative of emotional avoidance). As such, this functional approach may be considered an acceptance-based approach, conceptualizing both positive and negative emotions as functional and encouraging the awareness, understanding, and acceptance of all emotions.

*Relationship between emotion regulation and emotional vulnerability.* The second area of disagreement within the literature on emotion regulation concerns the relationship between emotion regulation and a temperamental emotional vulnerability. Specifically, some researchers equate emotion regulation with a particular temperament: low emotional intensity/reactivity (e.g., Livesley, Jang, & Vernon, 1998). This approach implies that intense, reactive emotional responses are problematic and inherently dysregulated. Although there is evidence to suggest that individuals who are more emotionally intense and reactive may be at greater risk for emotion dysregulation (Flett, Blankstein, & Obertynski, 1996), this relationship is not direct, and most research indicates that emotional intensity/reactivity in and of itself is not associated with negative psychological outcomes (Gratz, 2006; Larsen & Diener, 1987; Larsen, Diener, & Emmons, 1986).

Alternatively, other researchers define emotion regulation as separate from the nature or quality of the emotional response (Linehan, 1993; Mennin et al., 2005; Thompson & Calkins, 1996), implying that there is a difference between emotion regulation and one’s emotional temperament. According to this conceptualization, emotional intensity/reactivity does not preclude adaptive regulation; one can be emotionally intense or reactive and not dysregulated. Instead, this approach conceptualizes emotion regulation as any adaptive way of responding to one’s emotions, regardless of their intensity or reactivity (thereby distinguishing responses *to*

emotions from the nature/quality of emotions). Providing some support for the utility and practicality of this approach, an ongoing longitudinal study of borderline personality disorder (BPD) has found that BPD symptoms associated with a temperamental emotional vulnerability decrease the least over time, whereas symptoms associated with behavioral dyscontrol (e.g., self-harm) improve the most (Zanarini, Frankenburg, Hennen, & Silk, 2003). These findings suggest that characteristics of an individual's temperament or personality (such as emotional intensity and reactivity) may be both less likely to change and less amenable to treatment. As such, the clinical utility of trying to change these aspects of an individual's personality is unclear. Thus, conceptualizations of emotion regulation that distinguish emotion regulation from emotional temperament may arguably direct attention to clinical difficulties that are amenable to change, versus those that are not. Moreover, given that emotional intensity and emotional reactivity are not pathological in and of themselves, one could argue that there is no reason to try to change them, even if they were in some way amenable to treatment. Instead, it might make more sense to focus attention on behaviors that are both within an individual's control and directly associated with risk for clinical difficulties, such as the way individuals respond to and manage their emotions when they are experiencing distress.

#### *A Clinically-Useful Conceptualization of Emotion Regulation*

Based on the research reviewed above, a clinically useful conceptual definition of emotion regulation may arguably focus on adaptive ways of responding to emotional distress, rather than the control of emotions or dampening of emotional arousal in general. One such conceptualization emphasizes the functionality of emotions and defines emotion regulation as a multidimensional construct involving the: (a) awareness, understanding, and acceptance of emotions; (b) ability to engage in goal-directed behaviors, and inhibit impulsive behaviors, when

experiencing negative emotions; (c) flexible use of situationally-appropriate strategies to modulate the intensity and/or duration of emotional responses, rather than to eliminate emotions entirely; and (d) willingness to experience negative emotions as part of pursuing meaningful activities in life (for further details, see Gratz & Roemer, 2004). Conversely, deficits in any of these areas are considered indicative of emotion regulation difficulties.

Of note, this conceptualization of emotion regulation has overlap with some of the other processes of change examined in this book. For example, emotion regulation involves being accepting of one's internal experience (in particular, emotions), as well as compassionate toward oneself when experiencing emotions. Emotion regulation also has overlap with mindfulness, in its emphasis on observing and describing emotions (without necessarily acting on those emotions), as well as participating in present moment activities even in the context in the distress (i.e., engaging in goal-directed behavior when distressed). Thus, treatments that emphasize mindfulness, acceptance, and self-compassion should in theory also facilitate more adaptive emotion regulation.

Indeed, the acceptance-based nature of this conceptualization of emotion regulation is consistent with theories underlying acceptance- and mindfulness-based approaches to the treatment of psychopathology, suggesting that these types of treatments may be particularly useful for targeting emotion regulation effectively. In particular, given evidence that many individuals who engage in maladaptive behaviors struggle with their emotions (see, e.g., Chapman, Gratz, & Brown, 2006; Whiteside et al., 2007), treatments that focus on teaching individuals ways to avoid or control their emotions may not be useful, and may inadvertently reinforce a non-accepting, judgmental, and unhealthy stance toward emotions. Instead, the fact that such individuals may be caught in a struggle with their emotions suggests that they may

benefit from learning another (more adaptive) way of approaching and responding to their emotions (such as emotional acceptance, willingness, and mindfulness).

*Theorized Effects of Mindfulness and Acceptance-Based Interventions on Emotion Regulation*

As mentioned above, acceptance- and mindfulness-based treatments may be particularly useful for promoting emotion regulation and facilitating the development of more adaptive ways of responding to emotions. For example, the process of observing and describing one's emotions (an element common across many mindfulness- and acceptance-based treatments, including Dialectical Behavior Therapy [DBT], Acceptance and Commitment Therapy [ACT], Mindfulness-Based Cognitive Therapy [MBCT], Mindfulness-Based Stress Reduction [MBSR], and Acceptance-based Behavioral Therapy [ABBT] for generalized anxiety disorder; see Linehan, 1993; Hayes, Strosahl, & Wilson, 1999; Segal, Williams, & Teasdale, 2002; Kabat-Zinn, 2005; and Roemer, Orsillo, & Salters-Pedneault, 2008, respectively) is expected to promote emotional awareness and clarity, as clients are encouraged to observe their emotions as they occur in the moment and to label them objectively. Through this process, clients are increasing contact with these emotions and focusing attention on the different components of their emotional responses (expected to increase emotional awareness). Further, the process of describing emotions is expected to facilitate the ability to identify, label, and differentiate between emotional states.

Moreover, the emphasis on letting go of evaluations such as “good” or “bad”) and taking a nonjudgmental and nonevaluative stance toward these emotions is expected to facilitate emotional acceptance and increase emotional willingness. Specifically, given that the evaluation of emotions as bad or wrong likely both motivates attempts to avoid emotions and leads to the development of secondary emotional responses (e.g., fear or shame; Greenberg & Safran, 1987),



learning to approach emotions in a nonjudgmental fashion is expected to increase the willingness to experience emotions and decrease secondary emotional reactions. Indeed, it is likely this nonevaluative stance (i.e., the description of stimuli as “just is,” rather than as “bad” or “good”) that underlies many of the potential benefits of observing and describing one’s emotions.

Mindfulness training may also promote the decoupling of emotions and behaviors, teaching clients that emotions can be experienced and tolerated without necessarily acting on them. As such, these skills may facilitate the ability to control one’s behaviors in the context of emotional distress (one of the dimensions of emotion regulation as defined here). One factor thought to interfere with the ability to control impulsive behaviors when emotionally distressed is the experience of emotions as inseparable from behaviors, such that the emotion and the behavior that occurs in response to that emotion are experienced as one (e.g., anger and throwing things, or anxiety and taking an anxiolytic). Thus, the process of observing one’s emotions and their associated action urges is thought to facilitate awareness of the separateness of emotions and the behaviors that often accompany them, facilitating the ability to control one’s behaviors when distressed.

Another element of some acceptance-based treatments that is expected to promote a more adaptive approach to emotional experience is the emphasis on the function of emotions. Specifically, several treatments provide psychoeducation on the fact that emotions are evolutionarily adaptive and provide important information about the environment that can be used to guide behavior and inform an appropriate course of action (e.g., Gratz & Gunderson, 2006; Linehan, 1993; Roemer & Orsillo, 2005, 2007). These treatments teach clients that connecting with and acting on the information provided by their emotions in an adaptive way

will facilitate more effective engagement with (and responses to) their environment. This emphasis on the functionality of emotions is expected to increase emotional acceptance.

Finally, the emphasis on emotional willingness (i.e., an active process of being open to emotional experiences as they arise) within several acceptance-based treatments (including DBT, ACT, ABBT for generalized anxiety disorder, and acceptance-based emotion regulation group therapy; see Linehan, 1993; Hayes et al., 1999; Roemer et al., 2008; and Gratz & Gunderson, 2006, respectively) is also expected to promote emotion regulation. In particular, given that emotional nonacceptance and avoidance may amplify emotions and contribute to the experience of emotions as undesirable and negative, practicing emotional acceptance and willingness is expected to increase emotion regulation and reduce emotional suffering (which includes secondary emotional responses and failed attempts at emotional control/avoidance). Further, emotional willingness likely serves as a form of non-reinforced exposure to emotions, increasing tolerance for previously-avoided and feared emotions.

Despite the theoretical links between these processes commonly targeted within acceptance- and mindfulness-based interventions and adaptive emotion regulation (as well as the clear relevance of these treatments to various dimensions of emotion regulation), few studies have examined whether and to what extent these treatments do indeed affect emotion regulation. Likely contributing to the lack of research in this area was the absence (until recently) of comprehensive measures of emotion regulation based on an approach to the conceptualization of this construct that is theoretically consistent with the treatments of interest. Indeed, only by identifying and utilizing measures based on an acceptance-based conceptualization of emotion regulation that emphasizes the functionality of emotions can the potential mediating role of

emotion regulation as a process of change in acceptance- and mindfulness-based treatments be examined.

*An Acceptance-based Measure of Emotion Regulation Difficulties*

One measure that may be useful in this regard is the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004), a comprehensive measure of difficulties in emotion regulation based on the conceptualization of emotion regulation described above. Specifically, the DERS is a 36-item self-report measure that assesses individuals' typical levels of emotion regulation difficulties in general, as well as across a number of specific dimensions of emotion regulation. Individuals are asked to indicate how often the items apply to themselves, with responses ranging from 1 to 5, where 1 is "almost never (0-10%)," 2 is "sometimes (11-35%)," 3 is "about half the time (36-65%)," 4 is "most of the time (66-90%)," and 5 is "almost always (91-100%)." The DERS provides a total score (ranging from 36 to 180) that represents overall difficulties in emotion regulation, as well as six subscale scores: (a) nonacceptance of emotional responses (scores range from 6 to 30; e.g., "When I'm upset, I feel ashamed with myself for feeling that way."); (b) difficulties engaging in goal-directed behaviors when distressed (scores range from 5 to 25; e.g., "When I'm upset, I have difficulty getting work done."); (c) difficulties controlling impulsive behaviors when distressed (scores range from 6 to 30; e.g., "When I'm upset, I lose control over my behaviors."); (d) lack of emotional awareness (scores range from 6 to 30; e.g., "I pay attention to how I feel." [reverse scored]); (e) limited access to emotion regulation strategies perceived as effective (scores range from 8 to 40; e.g., "When I'm upset, I know that I can find a way to eventually feel better." [reverse scored]); and (f) lack of emotional clarity (scores range from 5 to 25; e.g., "I have difficulty making sense out of my feelings."). The

DERS is scored so that the overall score, as well as all subscale scores, reflect greater difficulties in emotion regulation.

In terms of reliability, the overall DERS score as well as the subscale scores have been found to have high internal consistency within both clinical (e.g., Gratz, Tull, Baruch, Bornovalova, & Lejuez, 2008; Fox et al., 2007; McDermott et al., in press) and nonclinical populations (e.g., Gratz & Roemer, 2004; Johnson et al., 2008). In addition, the DERS has demonstrated good test-retest reliability over a period of 4 to 8 weeks ( $\rho_T = .88$ ; Gratz & Roemer, 2004).

In support of the construct validity of this measure, scores on the DERS have been found to be significantly associated with a variety of behaviors thought to serve an emotion-regulating function, including deliberate self-harm (Gratz & Chapman, 2007; Gratz & Roemer, 2008), chronic worry (Salters-Pedneault et al., 2006; Vujanovic et al., 2008), intimate partner abuse perpetration among men (Gratz, Paulson, Jakupcak, & Tull, 2009), binge-eating (Whiteside et al., 2007), and cocaine-dependence (Fox et al., 2007). Further, scores on the DERS have been found to be heightened among individuals with psychiatric disorders thought to be characterized by emotion regulation difficulties, including BPD (vs. non-PD outpatients; Gratz, Rosenthal, et al., 2006), co-occurring BPD and substance dependence (vs. non-BPD substance users; Gratz et al., 2008), probable PTSD (vs. trauma-exposed individuals without PTSD; Tull, Barrett et al., 2007), and panic attacks (vs. non-panickers; Tull & Roemer, 2007). Finally, the DERS demonstrates significant associations with a number of constructs thought to be related to emotion regulation difficulties, including positive associations with negative affect (Cisler, Olatunji, & Lohr, in press; Johnson et al., 2008; Vujanovic et al., 2008), depression and anxiety symptom severity (Roemer et al., in press; Tull et al., 2009; Vujanovic et al., 2008), anxiety

sensitivity (Johnson et al., 2008; McDermott et al., in press; Tull, 2006; Tull et al., 2009; Vujanovic et al., 2008), and experiential avoidance (Gratz & Roemer, 2004; Tull & Gratz, 2007; Tull & Roemer, 2007), and negative associations with emotional expression and processing (Johnson et al., 2008), mindfulness (see Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Roemer et al., in press), and self-compassion (Roemer et al., in press).

The DERS and its subscales have also been found to be associated with behavioral, neurological, and experimental measures of related constructs. For example, the emotional nonacceptance subscale of the DERS has been found to predict performance on two behavioral measures of the willingness to experience emotional distress (Gratz, Bornovalova, Delany-Brumsey, Nick, & Lejuez, 2007), as well as a behavioral measure of the ability to engage in goal-directed behaviors when distressed (Gratz, Rosenthal, et al., 2006). Further, the DERS subscale of difficulties controlling impulsive behaviors when distressed has been found to be negatively associated with activation of the rostral anterior cingulate cortex (an area of the brain thought to be associated with inhibitory control) among cocaine dependent patients (Li, Huang, Bhagwagar, Milivojevic, & Sinha, 2008). Finally, the overall DERS score has been found to be strongly correlated with an experimental measure of emotion regulation among patients with BPD ( $r = -.63$ ; see Gratz, Rosenthal, et al., 2006).

Finally, and of particular relevance to this chapter, the DERS has been found to be sensitive to change over time (i.e., following short-term treatments). For example, Gratz, Lacroce, and Gunderson (2006) found significant and progressive improvements in emotion dysregulation (as assessed with the DERS) following 1 and 3 months of treatment in an integrative, step-down treatment program for borderline personality disorder. Further, Fox et al. (2008) found significant improvements in emotional awareness and clarity over the course of

inpatient treatment for alcohol dependent individuals. Finally, Fox et al. (2007) found that inpatient treatment for cocaine dependent patients resulted in significant improvements in overall emotion dysregulation, as well as the particular dimensions of difficulties engaging in goal-directed behavior when distressed, limited access to emotion regulation strategies perceived as effective, and lack of emotional clarity.

Of note, as the literature on the DERS continues to grow, there is emerging evidence of standard scores on the DERS within different clinical and nonclinical populations. Specifically, evidence suggests that nonclinical samples of college students and community adults average 75-80 on the DERS (Gratz & Roemer, 2004; Salters-Pedneault et al., 2006; Vujanovic et al., 2008), self-harming college students average 85-90 (Gratz & Chapman, 2007; Gratz & Roemer, 2008), treatment-seeking substance users average 85-90 (Gratz et al., 2008; Gratz & Tull, 2009; Fox et al., 2007), individuals with panic average 89-95 (Tull, 2006; Tull et al., 2009), analogue and clinical GAD samples average 95-100 (Roemer et al., in press; Salters-Pedneault et al., 2006), individuals with PTSD symptoms at a severity level consistent with a PTSD diagnosis average 100-105 (McDermott et al., in press; Tull, Barrett, et al., 2007), and borderline personality disorder outpatient samples average 125 (Gratz & Gunderson, 2006; Gratz, Rosenthal, et al., 2006).

Altogether, findings suggest that the DERS may be a useful measure for assessing changes in emotion regulation difficulties as a result of acceptance- and mindfulness-based treatments. Based on an acceptance-based conceptualization of emotion regulation, the DERS has been found to be related in expected ways with the other processes of change examined in this book, evidencing significant positive associations with experiential avoidance and significant negative associations with mindfulness and self-compassion. Further, the DERS has

been found to be associated with various forms of psychopathology and maladaptive behaviors thought either to stem from emotion dysregulation or to serve an emotion-regulating or emotionally-avoidant function. Finally, findings that the DERS is sensitive to change over time suggests that it may have utility in the assessment of mechanisms of change in treatment.

*Evidence for Emotion Regulation as a Mechanism of Change in Acceptance- and Mindfulness-Based Treatments*

Given evidence that emotion regulation difficulties play a central role in numerous forms of psychopathology (Gratz, Rosenthal, et al., 2006; Roemer et al., in press; Tull, Barrett, et al., 2007), and that adaptive emotion regulation is associated with greater emotional adjustment (Berking, Orth, Wupperman, Meier, & Caspar, 2008), treatments that promote adaptive emotion regulation may be expected to decrease psychopathology and increase well-being and adaptive functioning. Indeed, prospective studies have shown that the greater use of adaptive emotion regulation skills (e.g., emotional awareness, emotional acceptance, ability to engage in goal-directed behavior when distressed) predicts lower levels of negative affect and anxiety, as well as higher levels of positive affect two weeks later (Berking et al., 2008).

Although few studies to date have examined changes in emotion regulation processes as a result of acceptance- and mindfulness-based treatments, preliminary evidence suggests that these treatments may promote more adaptive emotion regulation across various patient populations. Specifically, improvements in emotion regulation have been reported following several brief acceptance- and mindfulness-based interventions.

*Changes in emotion regulation following acceptance- and mindfulness-based treatments.*

For example, Leahey et al. (2008) conducted a 10-week mindfulness-based cognitive-behavioral group intervention for binge eating. The overarching goal of this intervention was to reduce the

risk for negative health-related outcomes following bariatric surgery by increasing awareness of eating triggers and eating patterns (including the identification of internal experiences that precede binge eating), promoting mindful eating and mindfulness of emotions, and teaching adaptive emotion regulation skills. Findings of a small-scale trial among seven bariatric surgery patients indicate improvements in both binge eating and emotion regulation from pre- to post-treatment. Specifically, in addition to decreasing binge eating from clinical to non-clinical levels, this intervention resulted in meaningful improvements in all dimensions of emotion regulation difficulties assessed in the DERS, with the average overall DERS score within this sample decreasing from 99 to 85 over the course of the treatment.

Tull, Schulzinger, Schmidt, Zvolensky, and Lejuez (2007) also found that participation in a brief acceptance- and mindfulness-based behavioral intervention is associated with reductions in emotion regulation difficulties. Specifically, these researchers examined the effects of a 6-week adjunctive acceptance- and mindfulness-based behavioral intervention for heightened anxiety sensitivity among heroin dependent patients in residential substance abuse treatment. This brief intervention combines psychoeducation about anxiety, anxiety sensitivity, and heroin use as a method of experiential avoidance, with interoceptive exposure exercises and skills-training focused on heightening emotional acceptance, tolerance, and nonevaluative awareness (in order to facilitate willingness to experience anxiety and associated bodily sensations). In a preliminary case study of a long-term heroin user in residential substance abuse treatment, Tull and colleagues (2007) examined the impact of this treatment on anxiety sensitivity, heroin cravings, and emotion regulation difficulties. Findings indicate reductions in all three outcomes from pre- to post-treatment. Of particular relevance to this chapter, the patient reported a decrease in emotion regulation difficulties on the DERS from 88 (consistent with the average



score reported in other substance using samples; Fox et al., 2007) to 70 (somewhat lower than the average score found among nonclinical samples; Gratz & Roemer, 2004).

Finally, providing further evidence for the utility of acceptance- and mindfulness-based treatments in promoting adaptive emotion regulation, research indicates clinically-significant improvements in emotion regulation following completion of a 14-week, acceptance-based emotion regulation group therapy for women with self-harm and borderline personality disorder. Developed specifically to treat self-harm by directly targeting the function of this behavior, this adjunctive group therapy teaches self-harming women with BPD more adaptive ways of responding to their emotions (Gratz & Gunderson, 2006), systematically targeting each of the proposed dimensions of emotion regulation described above. In the preliminary trial of the efficacy of this group therapy, female outpatients with BPD and recent, recurrent self-harm were randomly assigned to receive this group in addition to their current outpatient therapy (group therapy + treatment as usual [TAU]), or to continue with their current outpatient therapy alone for 14 weeks (TAU). These two conditions were then compared on outcome measures of emotion dysregulation, emotional avoidance, self-harm frequency, BPD symptom severity, and severity of depression, anxiety, and stress symptoms (see Gratz & Gunderson, 2006). As expected, results indicated significant between-group differences (with large effect sizes) on all outcome measures at post-treatment, with the group therapy + TAU condition evidencing significant improvements (with large effect sizes) on all measures. Further, the vast majority of participants in the group therapy + TAU condition this condition (i.e., 83%) reached normative levels of functioning on the outcomes specifically targeted by the group: emotion dysregulation and experiential avoidance.

Evidence that adaptive emotion regulation increases following acceptance- and mindfulness-based treatments (Gratz & Gunderson, 2006; Leahey et al., 2008; Tull, Schulzinger, et al., 2007) suggests that problems stemming from emotion regulation difficulties may decrease as a result of these treatments and, conversely, aspects of functioning thought to be related to or facilitated by adaptive emotion regulation may increase. However, more direct support for emotion regulation as a mechanism of change in acceptance- and mindfulness-based treatments would be provided by findings that changes in emotion regulation mediate changes in psychiatric symptoms and adaptive functioning from pre- to post-treatment.

*Emotion regulation as a mediator of changes in symptoms following acceptance- and mindfulness-based treatments.* Although little research has specifically examined the mediating role of changes in emotion regulation in symptom improvement following acceptance- and mindfulness-based treatments, preliminary data on the acceptance-based emotion regulation group therapy described above (see Gratz & Gunderson, 2006) provide suggestive support for this possibility. Specifically, we examined whether changes in emotion dysregulation and emotional avoidance mediated changes in self-harm frequency following completion of the emotion regulation group therapy. Mediation was examined using a cross product test, which directly tests the significance of the difference between the direct and indirect (i.e., mediated) effects. In particular, the mediational analyses reported below used the nonparametric method of bootstrapping (which does not assume normal distribution of the cross product), with parameter estimates based on 3,000 bootstrap samples specifically. Results of these mediational analyses indicate that changes in self-harm were mediated by changes in emotion dysregulation and emotional avoidance in total ( $p < .05$ ). Further, individual mediators of changes in self-harm at post-treatment included emotional avoidance ( $p < .05$ ) and the particular emotion dysregulation

dimensions of lack of access to effective emotion regulation strategies ( $p < .05$ ) and difficulties controlling impulsive behaviors when distressed ( $p < .07$ ).

Thus, although preliminary in nature and based on a small sample size, these findings provide initial support for the mediating role of changes in emotion regulation in symptom improvement following acceptance-based treatments.

### *Conclusions*

Clinicians and researchers alike are increasingly acknowledging the potential benefits of incorporating acceptance- and mindfulness-based approaches into treatments for a variety of clinical disorders and maladaptive behaviors. As such, the past two decades have seen the development of innovative mindfulness- and acceptance-based treatments, including DBT (Linehan, 1993), ACT (Hayes et al., 1999), MBCT (Segal et al., 2002), MBSR (Kabat-Zinn, 2005), and ABBT for generalized anxiety disorder (Roemer et al., 2008), among others. Further, research is beginning to provide convincing evidence for the utility of these interventions across a wide range of difficulties, including borderline personality disorder (Lynch, Trost, Salsman, & Linehan, 2007), depression (Kenny & Williams, 2007; Teasdale et al., 2002), generalized anxiety disorder (Roemer et al., 2008), panic disorder (Levitt & Karekla, 2005), posttraumatic stress disorder (Orsillo & Batten, 2005), obsessive-compulsive disorder (Singh, Wahler, Winton, & Adkins, 2004), psychosis (Gaudiano & Herbert, 2006), substance use (Alterman, Koppenhaver, Mulholland, Ladden, & Baime, 2004; Witkiewitz, Marlatt, & Walker, 2005), generalized social anxiety disorder (Dalrymple & Herbert, 2007; Koszycki, Bengler, Shlik, & Bradwejn, 2007), and bipolar disorder (Williams et al., 2008).

Although limited, the theoretical and empirical literature reviewed above suggests that one process through which acceptance- and mindfulness-based interventions may bring about

behavioral change and symptom reduction is emotion regulation. Indeed, evidence suggests that a number of brief acceptance- and mindfulness-based treatments lead to improvements in emotion regulation difficulties, consistent with clinical literature on the central elements of these treatments and their theorized effects. Further, preliminary data on one acceptance-based treatment suggests that changes in maladaptive behavior as a result of the treatment were mediated by changes in emotion dysregulation and avoidance (Gratz & Gunderson, 2006). These findings build upon the rapidly growing body of literature demonstrating that emotion regulation is a clinically-relevant construct that may play a central role in the development and maintenance of diverse forms of psychopathology, and highlight the importance of targeting emotion regulation difficulties within acceptance- and mindfulness-based interventions. Yet, despite the growing evidence for emotion regulation as a clinically-relevant underlying etiological mechanism and treatment target, the research in this area is in its earliest stages and much remains to be explored.

In particular, although findings indicate that emotion regulation difficulties in general are associated with a variety of clinical difficulties, further research is needed to explore the specific dimensions of emotion regulation most relevant to various forms of psychopathology. Indeed, evidence for the unique role of different emotion regulation difficulties in specific clinical disorders and maladaptive behaviors would have important implications for the development of more targeted (and ultimately effective) interventions. Although research in this area is still in its infancy, preliminary findings provide evidence for the differential relevance of particular dimensions of emotion regulation difficulties to specific forms of psychopathology. For example, Salters-Pedneault et al. (2006) found that all dimensions of emotion regulation difficulties (with the exception of lack of emotional awareness) were significantly elevated

among individuals with (vs. without) analogue GAD when controlling for negative affect. On the contrary, only the specific dimensions of difficulties controlling impulsive behaviors when distressed, limited access to effective emotion regulation strategies, and lack of emotional clarity have been found to differentiate between trauma-exposed individuals with and without analogue PTSD when controlling for negative affect (Tull, Barrett, et al., 2007).

Further, research suggests that the relevance of specific dimensions of emotion regulation difficulties to deliberate self-harm may differ as a function of the individual's psychiatric difficulties (particularly, BPD and substance dependence). Specifically, whereas emotional nonacceptance is associated with self-harm among inpatients with substance dependence (Gratz & Tull, 2009) and college students without BPD pathology (Gratz, Breetz, & Tull, 2009), it is not associated with self-harm among individuals with analogue BPD (Gratz, Breetz, et al., 2009). Conversely, findings indicate that difficulties controlling impulsive behaviors when experiencing distress may be particularly relevant to self-harm among individuals with BPD pathology (Gratz, Breetz, et al., 2009), and difficulties engaging in goal-directed behaviors when distressed may be relevant to self-harm among substance users (Gratz & Tull, 2009). The specific dimension of lack of access to effective emotion regulation strategies, on the other hand, appears to be relevant to self-harm in general (regardless of the individual's BPD or substance dependence status; Gratz, Breetz, et al., 2009; Gratz & Tull, 2009). Further research examining the unique role of specific emotion regulation dimensions in the development and maintenance of psychopathology has the potential to inform the development of targeted interventions for a variety of clinical presentations.

Finally, it will be important for research to continue to examine the extent to which conceptualizations of emotion regulation overlap with the related constructs of mindfulness,

acceptance, willingness, and experiential avoidance. Only by elucidating the distinct and overlapping dimensions of these constructs will we be able to establish the unique role of each in the pathogenesis of psychopathology and (conversely) the promotion of emotional health. In support of this line of inquiry, Roemer et al. (in press) found that despite a strong association between emotion regulation and mindfulness, each explained a substantial amount of unique variance in generalized anxiety disorder symptom severity. Continued clarification of the conceptualization of these related constructs may aid in the refinement of existing measures, as well as the development of new methods for assessing emotion regulation, willingness, acceptance, and mindfulness in both clinical and basic research. Further, an improved understanding of the conceptualization and assessment of these various constructs may facilitate the refinement of existing treatment protocols by increasing our ability to dismantle acceptance- and mindfulness-based treatments and identify their active components.

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