

Emotion Regulation: Taking Stock and Moving Forward

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The field of emotion regulation has now come of age. However, enthusiasm for the topic continues to outstrip conceptual clarity. In this article, I review the state of the field. I do this by asking—and attempting to succinctly answer—10 fundamental questions concerning emotion regulation, ranging from what emotion regulation is, to why it matters, to how we can change it. I conclude by considering some of the challenges that confront this rapidly growing field.

Keywords: emotion, emotion regulation, self-regulation, affective science

Our emotions are often our best allies, helping us to respond energetically and effectively to the opportunities and difficulties we encounter (Lazarus, 1991). There are times, however, when our emotions are our worst enemies, leading us to think and behave in ways that are downright destructive (Parrott, 2001). Cultivating emotions that are helpful—and managing emotions that are harmful—is one of the central concerns of the field of emotion regulation.

Fifteen years ago, the nascent field of emotion regulation was more of a promissory note than a tangible reality (Gross, 1998). Since this time, what was a trickle of empirical and theoretical work on emotion regulation has become a flood (Gross, 2007, *in press*). In this article, I take stock of the field and consider how it might be moved forward. I do this by asking—and briefly answering—10 fundamental questions about emotion regulation. Given space constraints, my answers will of necessity be illustrative rather than exhaustive.

Question 1: What's New Here?

Two millennia ago, the Stoic philosopher Epictetus recommended that people control their emotions by controlling their thoughts (Epictetus, 2004). More recently—but still a long time ago—Freud directed attention to how people defend against anxiety-inducing impulses (Freud, 1926/1959), and Lazarus conducted a series of laboratory studies designed to assess the relative effectiveness of these defensive operations (Lazarus, 1966; Lazarus & Alfert, 1964).

Given this age-old interest in emotion regulation, one might well wonder: “What—if anything—is really new here?” I think at least three things are new. One thing that is new is the level of interest in this topic. Until the early 1990s, there were relatively few articles each year on emotion regulation. Now there are thousands of new articles each year (Figure 1), and emotion regulation is one

of the fastest growing areas within psychology (Koole, 2009). The exponential increase in research on emotion regulation has transformed the field, generating new questions and novel applications.

A second thing that is new is the frameworks, techniques, and methods that are being applied to examine a wide range of emotion regulatory processes. These include process-oriented information processing frameworks; statistical techniques, such as mediational analysis; and methods, such as experience sampling, functional MRI, electroencephography, and deep brain stimulation. These new approaches have made it possible to begin to discern and manipulate the specific psychological and biological mechanisms that enable us to influence our emotions as they unfold over time.

A third thing that is new is the diversity in the populations that are being studied. These range from nonhuman animals to humans, and, among humans, from the very young to the very old, from the Western to the distinctly non-Western in cultural orientation, and from the healthy to the mentally or physically ill. This expanded range of view has made it possible to begin to explore ontogenetic and phylogenetic continuities and discontinuities in emotion regulation abilities, to examine the influence of culture on emotion regulation use, and to test the causal role of emotion regulation processes in determining important psychological and physical health outcomes.

Question 2: What Exactly Is Emotion Regulation?

Enthusiasm for the topic of emotion regulation currently coexists with a great deal of confusion about what emotion regulation is (and isn't; Lewis, Zinbarg, & Durbin, 2010). From my perspective, emotion regulation requires the activation of a goal to up- or down-regulate either the magnitude or duration of the emotional response (Gross, Sheppes, & Urry, 2011). This goal may be activated in oneself or in someone else. *Intrinsic emotion regulation* refers to the first case (Romeo's emotions are regulated by Romeo); *extrinsic emotion regulation* refers to the second case (Romeo's emotions are regulated by Juliette; Gross & Thompson, 2007). Much of the research to date has focused on intrinsic emotion regulation, but there is growing interest in extrinsic or interpersonal emotion regulation (Coan & Maresh, *in press*; Shaver & Mikulincer, *in press*; Zaki & Williams, *in press*). This new work promises to illuminate the role of emotion regulation in interpersonal interactions, and to fashion much-needed bridges to devel-

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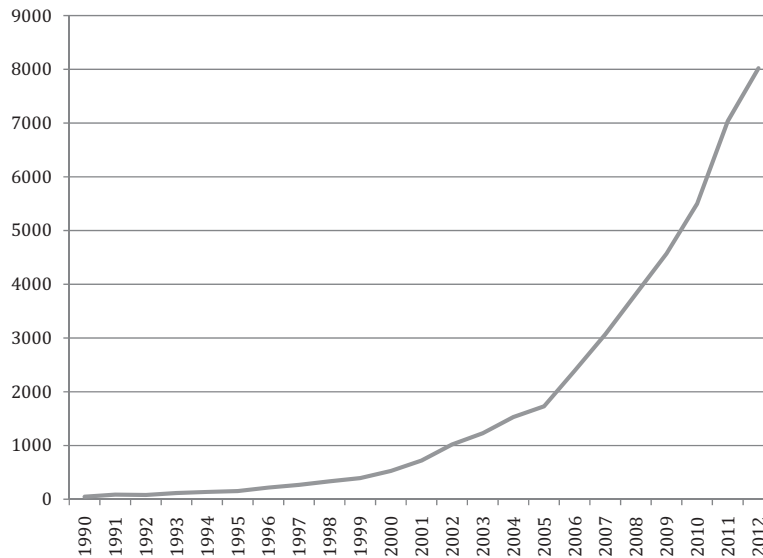


Figure 1. Number of publications containing the exact phrase “emotion regulation” in GOOGLE SCHOLAR from 1990–2012. Note that this is *not* a cumulative plot—each point represents the citation count for that single year.

opmental psychology, where a concern with extrinsic emotion regulation has long been dominant.

Once a goal to regulate emotion has been activated, many different processes may be recruited. These vary in whether they are explicit or implicit. Prototypic instances of emotion regulation are explicit, such as when we try hard to look calm even though we are very anxious before a talk, or when we try to soothe an upset child who is on the verge of melting down. However, emotion regulatory activity can also be implicit, and take place without conscious awareness. One example is quickly turning one’s attention away from potentially upsetting material. I find it useful to think of a continuum of emotion regulation possibilities that range from explicit, conscious, effortful, and controlled regulation to implicit, unconscious, effortless, and automatic regulation (Gyurak, Gross, & Etkin, 2011; Mauss, Bunge, & Gross, 2007).

Question 3: How Do People Regulate Their Emotions?

People try to decrease negative emotions, such as anger, sadness, and anxiety (Gross, Richards, & John, 2006). They also try to increase positive emotions, such as love, interest, and joy (Quoidbach, Berry, Hansenne, & Mikolajczak, 2010). Less frequently, people try to *increase* negative emotions (e.g., anger when collecting debts; Sutton, 1991), or *decrease* positive emotions (e.g., amusement during a serious meeting; Gruber, Mauss, & Tamir, 2011).

Whatever their goals, people do lots of different things to regulate their emotions (Parkinson & Totterdell, 1999). One challenge has been making sense of this array of regulatory activities. One framework that I have found useful is the process model of emotion regulation (Gross, 1998). This information-processing model treats each step in the emotion-generative process as a potential target for regulation. Figure 2 depicts the process model,

highlighting five points at which individuals can regulate their emotions (Gross & Thompson, 2007).

Each of these five points represents a family of emotion regulation processes: situation selection, situation modification, attentional deployment, cognitive change, and response modulation. Movement from left to right in Figure 2 represents movement through time within a given emotion-generative cycle. The idea that emotion regulation often alters the context that gave rise to the emotion in the first place is indicated by the feedback arrow in Figure 2.

Question 4: Who Cares How People Regulate Their Emotions?

According to the process model, different forms of emotion regulation should have different consequences. This is because they influence the emotion-generative process at different stages in the “assembly” of an emotion. One illustration of how this idea has been tested is the contrast between suppression (from the response modulation family) and reappraisal (from the cognitive change

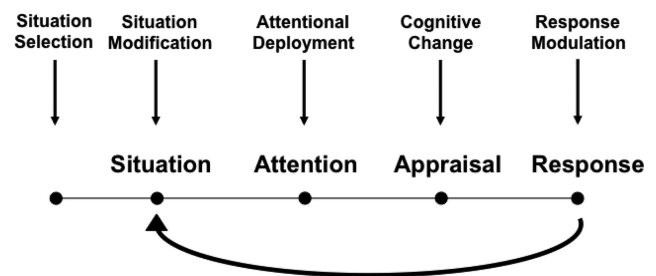


Figure 2. The process model of emotion regulation (Gross & Thompson, 2007).

family). This contrast is interesting because although both suppression and reappraisal are commonly employed to down-regulate emotion, suppression is a behaviorally oriented form of emotion regulation in which a person decreases emotion-expressive behavior while emotionally aroused, whereas reappraisal is a cognitively oriented form of emotion regulation in which a person tries to think about a situation in a way that alters the emotional response (for a broader review, see Webb, Miles, & Sheeran, 2012).

Affectively, suppression leads to decreased positive but not negative emotion experience, increased sympathetic nervous system responses, and greater activation in emotion-generative brain regions such as the amygdala. By contrast, reappraisal leads to decreased levels of negative emotion experience and increased positive emotion experience, has no impact on or even decreases sympathetic nervous system responses, and leads to lesser activation in emotion-generative brain regions such as the amygdala and ventral striatum (Gross & Thompson, 2007). *Cognitively*, suppression leads to worse memory. By contrast, reappraisal either has no impact on subsequent memory, or actually improves it, and can enhance exam performance (Jamieson, Mendes, Blackstock, & Schmader, 2010; Richards & Gross, 2000). *Socially*, suppression leads to less liking from partners, and to an increase in partners' blood pressure levels. Reappraisal, by contrast, has no detectable adverse consequences for social affiliation in the laboratory (Butler et al., 2003). The take-home message here is that we should care how people regulate emotions because different forms of emotion regulation may have quite different consequences (a theme to which I will return below, when I consider emotion regulation and mental and physical health).

Question 5: How Does Emotion Regulation Vary Over the Life Span?

Emotion regulation varies considerably across the life span. One organizing principle seems to be that individuals' growing (or diminishing) capacities are employed as best the individual can to successfully regulate emotions (Opitz, Gross, & Urry, 2012).

In infancy, extrinsic emotion regulation is initially dominant, with caregivers playing a major role. Even in the first few months of life, however, infants are capable of using gaze aversion to self-soothe when they are distressed (Crockenberg & Leerkes, 2004). In early to middle childhood, advances in linguistic, cognitive, and motor abilities enable additional emotion regulation capabilities, including an ability to modify thoughts that are giving rise to undesired emotional states (Eisenberg, Hofer, Sulik, & Spinrad, in press). Adolescence represents another period of change in emotion regulation (Riediger & Klipker, in press). From the physical changes associated with puberty, to the social and academic changes associated with the transition to middle school, adolescents' inner and outer worlds are typically in considerably greater turmoil than they were in childhood. This turmoil poses new emotion regulation challenges at a time when some forms of extrinsic emotion regulation (from the parents) may be unwelcome. At the same time, luckily, the maturation of prefrontal regions enables important new cognitive forms of emotion regulation (Casey et al., 2010; McRae et al., 2012).

Changes in emotion regulation are also evident in later adulthood (Urry & Gross, 2010). Such changes are often invoked to

explain the relatively high levels of well-being that often are seen in older age (Carstensen, Gross, & Fung, 1998). Evidence consistent with this view is found in older adults' tendency to attend to positive (vs. negative) features of the environment to a greater degree than younger adults (Isaacowitz, 2012; Mather & Carstensen, 2005), as well as their self-reports of greater use of cognitive reappraisal (John & Gross, 2004).

Question 6: Do Individual Differences in Emotion Regulation Matter?

Studying individual differences in specific emotion regulation patterns has allowed researchers to examine whether longer-term patterns of regulation use are associated with important outcomes. Consider individual differences in suppression and reappraisal (measured using scales that are uncorrelated). *Affectively*, people who use suppression frequently (vs. infrequently) experience less positive emotion and more negative emotion, including painful feelings of inauthenticity, as well as depressive symptoms. By contrast, people who use reappraisal frequently (vs. infrequently) experience and express more positive emotion and less negative emotion, including depressive symptoms (Gross & John, 2003; Nezlek & Kuppens, 2008). Reappraisers' reports of less negative emotion are corroborated by functional imaging studies in which they show lesser activation in emotion-related regions such as the amygdala while viewing negative pictures (Drabant, McRae, Manuck, Hariri, & Gross, 2009). *Cognitively*, individuals who use suppression frequently (vs. infrequently) have worse memory for emotional interactions. By contrast, individuals who use reappraisal frequently (vs. infrequently) have comparable or even enhanced memory (Richards & Gross, 2000). *Socially*, individuals who use suppression frequently (vs. infrequently) avoid close relationships and have less positive relations with others; this dovetails with peers' reports that suppressors have relationships that are less emotionally close. By contrast, individuals who use reappraisal frequently (vs. infrequently) are more likely to have positive relations with others, reports that match their peers' reports of greater closeness and liking (English, John, Srivastava & Gross, 2012; Gross & John, 2003).

Question 7: How Can We Explain Emotion Regulation Failure and Emotion Misregulation?

People often fail to regulate their emotions and—even when they do regulate, their regulatory efforts sometimes backfire, making things worse, not better. How can we explain such instances of emotion regulation failure and emotion misregulation?

To regulate emotion, one must accurately track ongoing (or anticipated) emotional responses either explicitly or implicitly. Failures at this stage may arise from simple tracking failures. Even if emotions are accurately tracked, however, one might still fail to activate a goal to regulate emotion, or make a mistake in the selection of the emotion regulatory goal.

Once an emotion regulatory goal has been activated, many different strategies may be selected to achieve that goal, some of which may be more appropriate to that particular context than others. What determines which of the many possible strategies is selected? Context-specific factors appear to play a role, such as the intensity of emotion that needs regulating. For example, people

prefer reappraisal to distraction when emotion intensity is low, but prefer distraction to reappraisal when emotion intensity is high because at high intensity levels, reappraisal is often no longer effective (Sheppes, Scheibe, Suri, & Gross, 2011). Other factors are more stable across situations. For example, people with incremental beliefs about emotion see emotions as the kinds of things that can be changed. People with entity beliefs about emotion see emotions as relatively immutable. Not surprisingly, individuals who have incremental beliefs are more adept at emotion regulation than those who have entity beliefs (Tamir, John, Srivastava, & Gross, 2007).

Even after activating a potentially appropriate strategy, success is by no means assured. This is because successful execution requires that the goal to regulate a particular emotion in a particular way (a) be shielded from other competing goals, and (b) be maintained and then flexibly adjusted if circumstances change (for the importance of flexibility, see Bonanno, Papa, Lalande, Westphal, & Coifman, 2004). This analysis suggests that there are so many paths to emotion regulation failure and misregulation, it's a wonder people ever are able to successfully regulate their emotions at all (see Webb, Gall, Miles, Gollwitzer, & Sheeran, 2012).

Question 8: What Is the Link Between Emotion Regulation and Psychopathology?

Many mental disorders are thought to involve to involve emotion dysregulation, that is, emotion regulation failure or emotion misregulation that results in problematic emotional states (Gross & Munoz, 1995; Jazaieri, Urry, & Gross, 2012). Some disorders—such as the anxiety disorders, the mood disorders, or borderline personality disorder—are *defined* by dysregulated emotional states (American Psychiatric Association, 2000). Others—such as attention-deficit/hyperactivity disorder, schizophrenia, or autism—typically include, but do not require, emotion dysregulation (Kimhy et al., in press; Mazefsky, Pelphrey, & Dahl, 2012; Nigg, 2000).

Consider social anxiety disorder. This disorder is characterized by an intense fear of social situations, and, in particular, a dread of being evaluated by others. This fear of being evaluated is thought to arise from a combination of dysfunctional patterns of construing social situations (Rapee & Heimberg, 1997), distorted self-beliefs (e.g., the belief that others would not like you if they really knew you; Moscovitch, Orr, Rowa, Reimer, & Antony, 2009), and maladaptive patterns of emotion regulation (e.g., difficulties with using cognitive reappraisal to down-regulate negative emotions; Goldin, Manber-Ball, Werner, Heimberg, & Gross, 2009).

Framing social anxiety disorder from an emotion regulation perspective highlights potential mechanisms underlying psychosocial interventions, such as cognitive-behavioral therapy. For example, one study showed that patients who received cognitive-behavioral therapy (vs. those randomized to a waitlist group) showed increased reappraisal self-efficacy, defined as the belief that could use reappraisal to regulate their emotions when needed. It is important to note that these changes in cognitive reappraisal self-efficacy mediated the effects of therapy on clinical improvement (Goldin et al., in press).

Question 9: Can Emotion Regulation Affect Physical Health?

Mounting evidence suggests that our emotional responses can influence our physical health. Particular attention has been paid to the role that anger, anxiety, and depression play in the context of cardiovascular disease. The core finding here is that heightened levels of negative emotion predict worse cardiovascular disease (Suls & Bunde, 2005). This finding has led researchers to speculate that emotion regulation might be implicated in cardiovascular outcomes.

In one test of this hypothesis, researchers examined the association between C-reactive protein (a marker of inflammation that predicts cardiovascular disease) and one generally more adaptive form of emotion regulation (cognitive reappraisal) as well as one generally less adaptive form of emotion regulation (expressive suppression). They found that reappraisal was associated with lower levels of C-reactivity protein, whereas suppression was associated with higher levels of C-reactivity protein (Appleton, Buka, Loucks, Gilman, & Kubzansky, in press). These findings are consistent with a prospective study in which over a thousand participants were followed for over 13 years. In this study, researchers found that an index of successful emotion regulation (defined using items from the Minnesota Multiphasic Personality Inventory [MMPI]) predicted decreased subsequent risk of heart attacks and coronary heart disease, even when controlling for traditional coronary risk factors (Kubzansky, Park, Peterson, Vokonas, & Sparrow, 2011). Although by no means definitive, these intriguing findings suggest that emotion regulation may influence cardiovascular health outcomes, and there is growing interest in the role of emotion regulation processes in a wide array of other physical health outcomes as well (DeSteno, Gross, & Kubzansky, in press).

Question 10: How Can Emotion Regulation Make the World a Better Place?

Interventions designed to alter patterns of emotion regulation typically target individuals who are suffering from—or who are at particular risk for—mental or physical disorders. However, interventions can also target nonclinical populations such as school-age children, executives, or helping professionals. One example targets negative emotions in the context of seemingly intractable global conflicts (Halperin, in press; Halperin, Russell, Trzesniewski, Gross, & Dweck, 2011).

To assess the role of emotion regulation in one such conflict, namely the ongoing Israeli-Palestinian conflict, a nationwide survey of Jewish-Israeli adults was conducted during the Gaza war between Israelis and Palestinians. This survey assessed both reappraisal use and attitudes toward providing humanitarian aid to Palestinian citizens. Findings indicated that Israelis who regulated their negative emotions during the war by using reappraisal were more supportive of providing humanitarian aid than Israelis who did not use reappraisal (Halperin & Gross, 2011). Building on this foundation, a second study randomized Israeli participants either to a reappraisal training condition or to a control condition just before the Palestinian UN bid in 2011. Findings indicated that a week after the training, participants who had been trained to use reappraisal showed greater support for conciliatory policies and less

support for aggressive policies toward Palestinians. These effects were still evident five months following training, and at each time point, negative emotion mediated the effects of reappraisal on conflict-related attitudes (Halperin, Porat, Tamir, & Gross, in press). More recent research has extended these findings to other global conflicts, such as the ongoing conflict in Cyprus (Halperin, Crisp, et al., in press), and there is a pressing need to examine whether interventions such as these result in lasting improvements.

Challenges and Opportunities

The enduring interest in emotion regulation across the centuries—coupled with the extraordinary growth of interest in emotion regulation over the past 15 years—augurs well for the future of this field. Emotions are consequential, and people care a great deal about how they and others regulate these emotions. However, I think the field now faces several challenges.

One family of challenges is theoretical. Many have found it useful to employ information processing models—like the process model—to specify how emotions are generated and regulated. Much remains to be done, however, to more fully specify these models. This is because the closer one looks, the harder it is to draw a sharp line between emotion and emotion regulation (Gross et al., 2011), leading some commentators to argue that the two sets of processes are so intertwined that no clear distinction can be made between the two (Kappas, 2011; Mesquita & Frijda, 2011). One challenge for the future is clarifying the circumstances under which it is helpful to invoke the notion of emotion regulation (as opposed to emotion alone), as people's perspectives on this issue vary according to their approaches to emotion (Gross & Barrett, 2011) and their particular scientific goals (Gross et al., 2011).

A second family of challenges is empirical. Our initial attempts to examine the explicit and implicit processes that enable intrinsic and extrinsic emotion regulation clearly represent the first few steps in a much longer journey. Only a few of the many regulatory processes that people regularly engage have been subjected to scientific scrutiny, and we still know far too little about how these regulatory processes develop, what effects they have on negative and positive emotions, and how maladaptive forms of emotion regulation can be changed. We are beginning to probe the neural correlates of different types of emotion regulation, but it is not yet clear how the neural systems that support emotion regulation participate in other forms of self-regulation (Ochsner & Gross, in press). Much also remains to be done to clarify boundary conditions. When, for example, are ostensibly “unhelpful” forms of emotion regulation actually helpful? And when are ostensibly “helpful” forms of emotion regulation actually unhelpful? Adverse social consequences of suppression are not evident in individuals with bicultural European/Asian values (Butler, Lee & Gross, 2007; Soto, Perez, Kim, Lee, & Minnick, 2011), and if emotional intensity is already high when reappraisal is engaged, it no longer seems to have the experiential or physiological benefits seen in other contexts (Sheppes, Catran, & Meiran, 2009).

A third family of challenges is sociological. In this review, I have focused on a small subset of the psychological research that has been done on emotion regulation, but many other disciplines are also interested in emotion regulatory processes. One crucial challenge is linking psychological research on emotion regulation with related work from fields such as psychiatry (e.g., Etkin,

Egner, Peraza, Kandel, & Hirsch, 2006), philosophy (e.g., Gendler, 2008), sociology (Hochschild, 1983), business (Côté, 2005), and neuroeconomics (Rangel, Camerer, & Montague, 2008). Clearly, a more complete understanding of the causes and consequences of emotion regulation will be facilitated via cross-fertilization among affective scientists across disciplines, and new vehicles (e.g., grants, societies) are needed to facilitate this cross-fertilization.

When I take stock of the field of emotion regulation, I am deeply encouraged by the progress made in this field during its first 15 years. We now know a great deal that we didn't know 15 years ago. This increased understanding is enabling us to now ask smarter questions, and develop (and take advantage of) new methods for more precisely delineating and manipulating underlying psychological and biological mechanisms. At the same time, we are managing to keep in view the importance of context—including both proximal and distal intra- and interpersonal contextual factors. Much more remains to be done, of course, but the spectacular growth in work on emotion regulation by an increasingly diverse community of scholars and practitioners would seem to promise a very bright future indeed for this field.

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