

## CHAPTER 1

# Emotion Regulation: Conceptual and Empirical Foundations

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Emotions often are wonderfully helpful. They can direct attention to key features of the environment, optimize sensory intake, tune decision making, ready behavioral responses, facilitate social interactions, and enhance episodic memory. However, emotions can harm as well as help, particularly when they are of the wrong type, intensity, or duration for a given situation.

At such moments, we may try to *regulate* our emotions. This fundamental insight—that emotions can and should be regulated in certain situations—is well represented over the centuries in each of the major world traditions (for a more detailed historical overview of the field, see Gross, 1999).

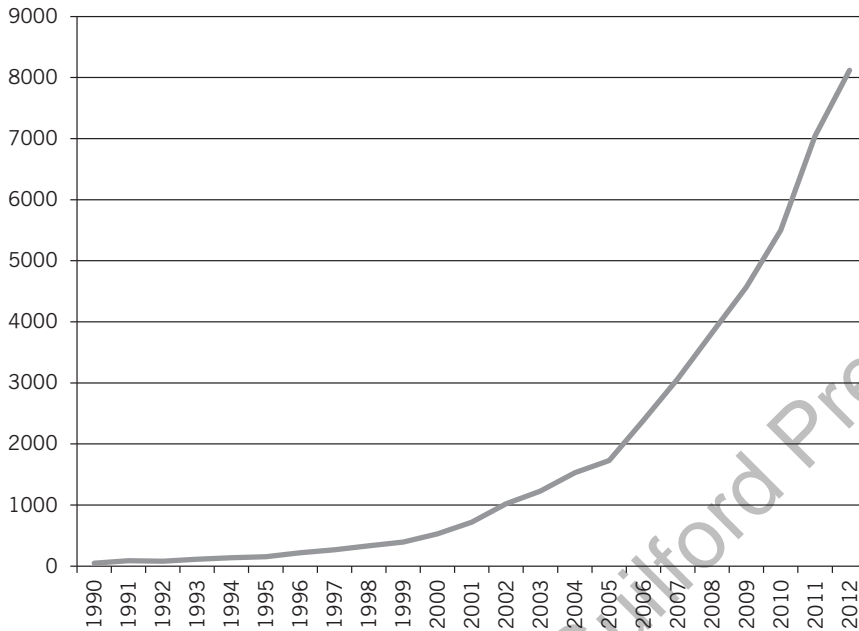
In the past century, psychological investigations of emotion regulation have focused on psychological defenses (Freud, 1926/1959), stress and coping (Lazarus, 1966), attachment (Bowlby, 1969), and self-regulation (Mischel, 1996). However, until the early 1990s, there were relatively few papers each year containing the term *emotion regulation* (see Figure 1.1). Now there are thousands of new publications each year, making emotion regulation one of the fastest growing areas within the field of psychology (Koole, 2009; Tamir, 2011).

What is needed is a framework for organizing this bewildering array of findings. My aim in this chapter is to provide such a con-

ceptual and empirical framework. Because a discussion of emotion regulation presupposes an understanding of what emotion is, in the first section I present the modal model of emotion and relate emotion to other affective processes. In the second section, I describe the process model of emotion regulation and distinguish emotion regulation from other forms of self-regulation. This prepares the way for the third section, in which I discuss key findings regarding emotion regulation goals, strategies, and outcomes. In the final section, I highlight three of the biggest challenges—and opportunities—for those interested in emotion regulation.

### Emotions and Related Processes

One of the toughest questions in the field of affective science is one of the simplest, namely: What *is* an emotion? Theorists have tried to address this question by posing two other questions: What attributes are shared by all emotions (necessary conditions)? What attributes—if present—guarantee that something is an emotion (sufficient conditions)? Unfortunately, efforts to derive this kind of tidy classical definition of emotion are thwarted by the fact that *emotion* refers to an astonishing array of responses, from the mild to the intense, the brief to the extended,



**FIGURE 1.1.** Number of publications containing the exact term *emotion regulation* in Google Scholar each year from 1990 to 2012 (Gross, 2013). Note that this is *not* a cumulative plot; each point represents 1 year's citations.

the simple to the complex, and the private to the public. Disgust at a prejudiced comment counts as an emotion. So does amusement at a funny mishap, anger at social injustice, joy at the prospect of receiving a promotion, surprise at a friend's "new look," grief at the death of a spouse, and embarrassment at a child's misbehavior. What are the core features of these diverse emotions?

### Core Features of Emotion

The first core feature of emotion has to do with *when it occurs*. According to appraisal theory, emotions arise when an individual attends to and evaluates (appraises) a situation as being relevant to a particular type of currently active goal (Lazarus, 1991; Scherer, Schorr, & Johnstone, 2001). The goals that underlie this evaluation may be enduring (staying alive) or transient (wanting another piece of cake). They may be conscious and complicated (aspiring to become a professor) or unconscious and simple (trying to avoid stepping in puddles). They may be widely shared (having close friends) or

highly idiosyncratic (finding a new way of tying one's shoes). Whatever the goal, and whatever meaning the situation has in light of the goal, it is this meaning that gives rise to emotion. As this meaning changes over time—due either to changes in the situation itself or changes in the meaning the situation holds for the individual—the emotion will also change.

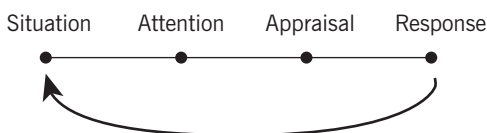
The second core feature of emotion has to do with its *multifaceted nature*. Emotions are whole-body phenomena that involve loosely coupled changes in the domains of subjective experience, behavior, and central and peripheral physiology (Mauss, Levenson, McCarter, Wilhelm, & Gross, 2005). The subjective aspect of emotion is so central to many instances of emotion that the terms "emotion" and "feeling" often are used interchangeably. But emotions not only make us feel, they also incline us to act (Frijda, 1986). These impulses to act in certain ways (and not act in others) include changes in facial behavior and body posture, as well as situation-specific instrumental actions such as staring, hitting, or running.

These changes in experience and behavior are associated with autonomic and neuroendocrine responses that both anticipate emotion-related behaviors (thereby providing metabolic support for the action) and follow them, often as a consequence of the motor activity associated with the emotional response (Lang & Bradley, 2010). As functionalist accounts of emotion make clear, the multifaceted responses that comprise emotion often (but not always) are useful in helping to achieve the goals that gave rise to emotions in the first place (Levenson, 1999).

### The Modal Model of Emotion

These core features constitute what has been referred to as the *modal model* of emotion—so called because these features are evident in many different approaches to emotion (Barrett, Ochsner, & Gross, 2007; Gross, 1998a). According to this model, emotions involve person–situation transactions that compel attention, have meaning to an individual in light of currently active goals, and give rise to coordinated yet flexible multisystem responses that modify the ongoing person–situation transaction in crucial ways. The modal model lies at the heart of lay intuitions about emotion and also represents key points of convergence among researchers and theoreticians concerned with emotion.

In Figure 1.2, I present the situation–attention–appraisal–response sequence specified by the modal model of emotion in highly abstracted and simplified form. This sequence begins with a psychologically relevant situation. Often, this is a situation that can be specified by referring to features of the external environment (e.g., the snake slithering into my tent). However, psychologically relevant “situations” can also be internal (e.g., the sneaking suspicion that I’ll never amount to anything). Whether



**FIGURE 1.2.** The modal model of emotion.

external or internal, situations are attended to in various ways, giving rise to appraisals that constitute the individual’s assessment of what the situation means in light of relevant goals (Ellsworth & Scherer, 2003). The emotional responses generated by these unfolding appraisals involve changes in experiential, behavioral, and neurobiological response systems.

Like many other responses we make, emotional responses often change the situation that gave rise to the response in the first place. Figure 1.2 depicts this aspect of emotion by showing the response looping back to (and modifying) the situation that gave rise to the emotion. To make this idea more concrete, imagine a husband and wife heatedly disagreeing about whether household chores are being fairly divided. Several minutes into the discussion, the husband starts to cry (yes, the husband). This emotional response dramatically alters the interpersonal situation. This new situation now gives rise to a new response from the wife—now no longer angry but instead feeling compassion. This compassionate response itself further changes the interpersonal situation, giving rise to other emotions in each of them. The key idea here is that emotional responses often lead to changes in the environment that alter the probability of subsequent instances of that and other emotions (for a more detailed discussion of this point, see Gross & Thompson, 2007).

### Emotions and Other Affective Processes

One thing that makes the emotion literature challenging is that many different terms are used to refer to emotion-related processes, including affect, emotion, stress, and mood (Davidson, 1994). Unfortunately, these terms are used in different ways by different researchers, leading at times to some degree of “conceptual and definitional chaos” (Buck, 1990, p. 330). To organize this chaotic landscape, I find it useful to view *affect* as the umbrella term for states that involve relatively quick good–bad discriminations (Scherer, 1984). These affective states include (1) *emotions* such as anger and sadness, (2) *stress responses* to circumstances that exceed an individual’s ability to

cope, and (3) *moods* such as depression and euphoria.

How are these various affective processes distinguished? Although both emotion and stress involve whole-body responses to significant events, “stress” typically refers to negative (but otherwise unspecified) affective responses, whereas “emotion” refers to both negative and positive affective states (Lazarus, 1993). Emotions also may be distinguished from moods (Parkinson, Totterdell, Briner, & Reynolds, 1996). Moods often last longer than emotions, and compared to moods, emotions are typically elicited by specific objects and give rise to behavioral response tendencies relevant to these objects. By contrast, moods are more diffuse, and although they may give rise to broad action tendencies such as approach or withdrawal (Lang, 1995), moods bias cognition more than they bias action (Siemer, 2001).

Lest these distinctions seem academic, consider the term *affect*. From my perspective, *affect* belongs at the top of the hierarchy, as the superordinate term in this set of emotion-related terms. However, others take a different view. For example, some use the terms *affect* and *emotion* interchangeably (Zajonc, 1984). For others, *affect* refers to the experiential component of emotion (Buck, 1993; MacLean, 1990). Still others use *affect* to refer to the behavioral component of emotion (American Psychiatric Association, 2013; Kaplan & Sadock, 1991). As these observations suggest, clarity regarding how each of these constructs is being used is a necessary prerequisite for an analysis of how these various processes are (or are not) regulated (Gross, 2010).

## Emotion Regulation and Related Processes

*Emotion regulation* refers to shaping which emotions one has, when one has them, and how one experiences or expresses these emotions (Gross, 1998b). Thus, emotion regulation is concerned with how emotions themselves are regulated (regulation *of* emotions), rather than how emotions regulate something else (regulation *by* emotions). Defined in this way, many different activities count as emotion regulatory. These include pound-

ing your pillow when you're angry at a boss, imagining your audience naked when you're nervous about performing in a piano recital, picking up the phone to call a friend when you're feeling sad, telling a child who is having a tantrum not to act like such a baby, anticipating going to a fun party on the weekend to reenergize yourself midweek, going for a run after an upsetting fight with a friend, playing calming music after a long day at work, leaving a tense meeting early to cool down, going to a club to have a drink, and watching *It's a Wonderful Life* for the 600th time. Because there seems to be no limit to the activities that may qualify as emotion regulatory, what is needed—as with emotion—is a description of its core features.

### Core Features of Emotion Regulation

The first core feature of emotion regulation is the *activation of a goal* to modify the emotion-generative process (Gross, Sheppes, & Urry, 2011). This goal may be activated either in oneself or in someone else. To mark this distinction, it is useful to refer to *intrinsic emotion regulation* in the first case (James regulates his own emotions: emotion regulation *in self*) and to *extrinsic emotion regulation* in the second case (James regulates Sarah's emotions: emotion regulation *in another*). Researchers who work with adults typically focus on intrinsic emotion regulation (Gross, 1998b; but see Levenson, Haase, Bloch, Holley, & Seider, this volume). By contrast, researchers who work with infants and children typically focus on extrinsic emotion regulation (e.g., Cole, Martin, & Dennis, 2004). Although this distinction is often helpful, it is worth noting that in some situations intrinsic and extrinsic emotion regulation co-occur, such as when James regulates Sarah's emotions (extrinsic regulation) in order to calm himself down (intrinsic regulation).

The second core feature of emotion regulation is the *engagement of the processes that are responsible for altering the emotion trajectory*. Many different processes can be recruited to regulate emotions, and these vary considerably in the degree to which they are explicit versus implicit. Many prototypical instances of emotion regulation are explicit, and thus conscious, such as when

we try hard to look calm even though we are very anxious before a talk, or when we try to look on the bright side of a bad outcome to cheer ourselves up. However, emotion regulatory activity can also be implicit and take place without conscious awareness. Examples include hiding the affection one feels for another person due to a fear that one will be rejected, or quickly turning one’s attention away from potentially upsetting material. Previous discussions have distinguished categorically between explicit and implicit processes (Masters, 1991). However, it may be more 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 & Etkin, this volume; Gyurak, Gross, & Etkin, 2011).

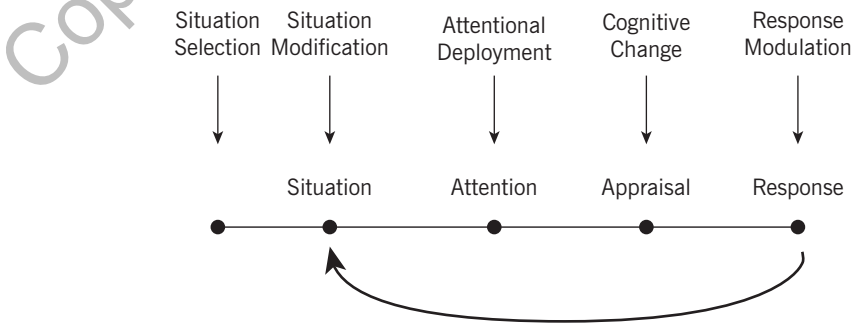
The third core feature of emotion regulation is its *impact on emotion dynamics* (Thompson, 1990), or the latency, rise time, magnitude, duration, and offset of responses in experiential, behavioral, or physiological domains. Depending on the individual’s goals, emotion regulation may increase or decrease the latency, rise time, magnitude, duration, or offset of the emotional response (compared to the emotional response that would have occurred in the absence of emotion regulation) (Gross, 1998b). Emotion regulation also may change the degree to which emotion response components cohere as the emotion unfolds, such as when changes in emotion experience and physiological responding occur in the absence of facial behavior (Dan-Glauser & Gross, 2013).

These three core features of emotion regulation—the activation of a regulatory goal, the engagement of regulatory processes, and the modulation of the emotion trajectory—are common features of many diverse types of emotion regulation. In a later section, I turn to a more complete discussion of each of these three core features, as I review what is known about emotion regulation goals, emotion regulation strategies, and emotion regulation outcomes. Before elaborating upon each of these core features, however, we need to consider what makes different forms of emotion regulation so different from one another.

**The Process Model of Emotion Regulation**

One framework that has proven useful for addressing this question is the process model of emotion regulation (Gross, 1998b). This information-processing model takes as its starting point the modal model (Figure 1.2), which—as we have seen—specifies the sequence of processes involved in emotion generation. The process model of emotion regulation builds on the modal model, and treats each step in the emotion-generative process that is described in the modal model as a potential target for regulation. In Figure 1.3, I present the process model, which highlights five points at which individuals can regulate their emotions.

These five points represent five families of emotion regulation processes: situation selection, situation modification, attentional deployment, cognitive change, and response modulation (Gross, 1998b). These



**FIGURE 1.3.** The process model of emotion regulation.

families are distinguished by the point in the emotion-generative process at which they have their primary impact. Movement from left to right in Figure 1.3 represents movement through time: A particular situation is selected, modified, attended to, appraised, and yields a particular set of emotional responses. However, as emphasized in Figure 1.2, emotion generation is an ongoing process, extending beyond a single episode. This dynamic aspect of emotion and emotion regulation is signaled by the feedback arrow in Figure 1.3 from the emotional response back to the situation (there may in fact be many such points of feedback). I describe these five families of regulatory strategies in more detail below.

### **Emotion Regulation and Related Constructs**

Before considering emotion regulation processes in greater detail, however, it is important to note in passing that—paralleling the distinctions drawn among members of the affective family presented earlier—emotion regulation can be seen as subordinate to the broader construct of *affect regulation*. Under this broad heading fall all manner of efforts to influence our valenced responses (Westen, 1994), including (1) *emotion regulation*, (2) *coping*, and (3) *mood regulation*. Because virtually all goal-directed behavior can be construed as maximizing pleasure or minimizing pain—and thus as affect regulatory in a broad sense—it is frequently useful to sharpen the focus by examining one or more of these three second-level families of processes.

Coping is distinguished from emotion regulation both by its predominant focus on decreasing negative affect and its emphasis on much larger periods of time (e.g., coping with bereavement). As noted earlier, moods are typically of longer duration and are less likely to involve responses to specific “objects” than are emotions (Parkinson et al., 1996). In part due to their less well-defined behavioral response tendencies, in comparison with emotion regulation, mood regulation and mood repair are more concerned with altering emotion experience than emotion behavior (Larsen, 2000). It is not yet known whether the regulation of emotion, stress responses, and moods are

more similar than different, more different than similar, or somewhere in between. It therefore is usually a good idea to pay close attention to the type of affect targeted for regulation.

### **Emotion Regulation Goals, Strategies, and Outcomes**

As we have seen, emotion regulation has three core features. The first—the emotion regulation *goal*—is what people are trying to accomplish. The second—the emotion regulation *strategy*—is the particular processes that are engaged in order to achieve that goal. The third—the *outcome*—refers to the consequences of trying to achieve that particular emotion regulation goal using that particular strategy. In the following sections, I review each of these three core features of emotion regulation in turn, selectively highlighting what we know about each.

#### **Emotion Regulation Goals**

If asked about times they have tried to regulate their emotions, people often describe efforts to down-regulate negative emotions (i.e., diminish their intensity or duration), especially anger, sadness, and anxiety, with a particular focus on decreasing the experiential and behavioral aspects of negative emotions (Gross, Richards, & John, 2006). People also report trying to up-regulate positive emotions (i.e., increase their intensity or duration), especially love, interest, and joy, often by sharing their positive experiences with others (Quoidbach, Berry, Hansenne, & Mikolajczak, 2010). These reports of everyday emotion regulation are consistent with traditional hedonic accounts of affect regulation, which assume that individuals are motivated to decrease negative emotional states and increase positive emotional states (Larsen, 2000).

It turns out, however, that there is more to emotion regulation than this. Indeed, the down-regulation of negative emotions and the up-regulation of positive emotions can be seen as just two cells in the  $2 \times 2$  matrix shown in Figure 1.4. It may seem odd to imagine people wanting more of a “bad” thing or less of a “good” thing, but there are many reasons people might want

	Decrease	Increase
Negative emotion	Trying to calm oneself down when angry (Int)	Firing oneself up before a big game (Int)
	Helping a tearful child untangle his kite (Ext)	Reframing a friend's "little fight" with a spouse as serious (Ext)
Positive emotion	Wiping a smile off one's face at a funeral (Int)	Sharing great news with close friends (Int)
	Helping giggling girls calm down at bedtime (Ext)	Telling someone a joke to cheer her up (Ext)

**FIGURE 1.4.** Emotion regulation goals can include efforts to decrease or increase either the magnitude or duration of negative or positive emotion. Decreasing negative emotion appears to be the most common regulation goal in everyday life, followed by increasing positive emotion. Emotion regulation may be either intrinsic (Int) or extrinsic (Ext).

to up-regulate negative emotions or down-regulate positive emotions, as Parrott (1993) has observed in the context of mood regulation. Motives for up-regulating negative emotions include promoting a focused, analytic mindset; fostering an empathic stance; and influencing others' actions. Motives for down-regulating positive emotions include maintaining a realistic mindset; being mindful of social conventions; and concealing one's feelings from others.

This broader view of emotion regulation goals suggests something important about what people are trying to accomplish when they regulate their emotions. Sometimes—and perhaps often—people are motivated by “hedonic considerations,” or the wish to increase short-term pleasure and decrease short-term pain. At other times, however, people are motivated by “instrumental considerations”; that is, they are motivated to change their emotions in order to achieve some other, nonemotional outcome (Mauss & Tamir, this volume; Tamir, 2009). Sometimes, these instrumental goals may be related to specific work demands, such as appearing relaxed and upbeat for nervous

airline passengers (Hochschild, 1983), seeming calm yet empathic for nervous medical patients (Larson & Yao, 2005), showing high levels of interest in students (R. E. Sutton, 2004), or sounding angry when trying to collect payment on debts (R. I. Sutton, 1991). At other times, these instrumental goals are related to broader cultural imperatives (Mesquita, De Leersnyder, & Albert, this volume); these may dictate that people show (Szczurek, Monin, & Gross, 2012) or feel (Tsai, 2007) particular emotions and not others in a given situation.

### Emotion Regulation Strategies

Whatever emotion regulation goals people may have, they can do many different things to achieve them. They can even do many different things at once—or at least in quick succession. For example, after a stressful day, some people might turn off their cell phone, have a beer, and watch an entertaining program on television while holding hands with their partner. This kind of mixing of regulation strategies is probably common in everyday life. For analytic purposes, however, the process model distinguishes five families of regulatory processes.

The most forward-looking approach to emotion regulation is *situation selection*. This type of emotion regulation involves taking actions that make it more (or less) likely that one will end up in a situation that one expects will give rise to desirable (or undesirable) emotions. Examples include avoiding a grumpy neighbor, arranging a play date for a child, or seeking out a friend with whom one can have a good cry. Despite the commonness of situation selection, it is hard to tell how one will feel in different situations (in the case of intrinsic regulation), and harder still to be sure how another person will feel in various situations (in the case of extrinsic regulation).

*Situation modification* refers to directly modifying a situation so as to alter its emotional impact. When one's parents visit at college, situation modification may take the form of hiding piles of dirty laundry or questionable artwork. Parents also engage in their share of situation modification, which ranges from helping with frustrating math problems to suggesting games to play on a rainy day. Because efforts to modify a

situation may effectively call a new situation into being, it is sometimes difficult to distinguish between situation selection and situation modification. Also, although “situations” can be external or internal, situation modification—as I mean it here—has to do with modifying external, physical environments. Modifying “internal” environments (i.e., thoughts) will be considered later, in the context of cognitive change.

*Attentional deployment* refers to directing attention within a given situation in order to influence one’s emotions. Attentional deployment is one of the first emotion regulatory processes to appear during development (Rothbart, Ziaie, & O’Boyle, 1992), and it is used from cradle to grave, particularly when it is not possible to modify one’s situation. One of the most common forms of attentional deployment is *distraction*, which focuses attention on other aspects of the situation or moves attention away from the situation altogether; distraction also may involve changing internal focus, such as when someone calls to mind thoughts or memories that help to instantiate the desired emotional state (Thiruchselvam, Hajcak, & Gross, 2012).

*Cognitive change* refers to modifying how one appraises a situation so as to alter its emotional significance, either by changing how one thinks about the situation or about one’s capacity to manage the demands it poses. Sometimes, cognitive change is applied to an external situation (e.g., “This interview is a chance for me to learn more about the company”). At other times, cognitive change is applied to an internal situation (e.g., “I’m not anxious—I’m getting ‘pumped up’ for a game, and this will help me play my best”). One particularly well-studied form of cognitive change is *reappraisal*; this form of cognitive change is often used to decrease negative emotions, but it can also be used to increase or decrease negative or positive emotions (Samson & Gross, 2012).

The fifth family of emotion regulatory processes, *response modulation*, occurs late in the emotion-generative process, after response tendencies have already been initiated, and refers to directly influencing experiential, behavioral, or physiological components of the emotional response. Physical exercise and deep-breathing relaxation techniques can be used to decrease experiential and physiological aspects of negative emo-

tions, and alcohol, cigarettes, drugs, and even food also may be used to modify emotion experience. Another common form of response modulation involves regulating emotion-expressive behavior. One well-researched example of response modulation is *expressive suppression*, in which a person tries to inhibit ongoing negative or positive emotion-expressive behavior.

### **Emotion Regulation Outcomes**

At the heart of the process model is the intuition that different forms of emotion regulation might have different consequences, both immediately and over the long term. This prediction flows from the idea that if emotions develop over time, then intervening at different points in the emotion-generative process should lead to different outcomes.

To test this idea, researchers have used both experimental and correlational approaches to investigate the affective, cognitive, and social consequences of different types of emotion regulation. This work is yielding a rich and nuanced understanding of how specific forms of emotion regulation affect both the people who are doing the regulating and the people around them.

To illustrate this rapidly growing body of work, I focus on one of the most well-researched contrasts in the field, namely, the contrast between reappraisal (from the cognitive change family) and suppression (from the response modulation family). This contrast is an interesting one 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 more comprehensive review of the effects of different emotion regulation strategies, see Webb, Miles, & Sheeran, 2012).

*Affectively*, experimental studies have shown that suppression leads to decreased positive but not negative emotion experience (Gross, 1998a; Gross & Levenson, 1993, 1997; Stepper & Strack, 1993; Strack, Martin, & Stepper, 1988), increased symp-



thetic nervous system responses (Demaree et al., 2006; Gross, 1998a; Gross & Levenson, 1993, 1997; Harris, 2001; Richards & Gross, 2000), and greater activation in emotion-generative brain regions such as the amygdala (Goldin, McRae, Ramel, & Gross, 2008). Correlational studies are largely congruent with these experimental findings and, if anything, suggest a more negative profile of affective consequences for suppression, in that compared to people who do not report using suppression, people who report using suppression experience less positive emotion and more negative emotion, including painful feelings of inauthenticity as well as depressive symptoms (Gross & John, 2003; Moore, Zoellner, & Mollenholt, 2008; Nezlek & Kuppens, 2008).

By contrast, experimental studies have shown that reappraisal leads to decreased levels of negative emotion experience and increased positive emotion experience (Gross, 1998a; Feinberg, Willer, Antonenko, & John, 2012; Lieberman, Inagaki, Tabibnia, & Crockett, 2011; Ray, McRae, Ochsner, & Gross, 2010; Szasz, Szentagotai, & Hofmann, 2011; Wolgast, Lundh, & Viborg, 2011), has no impact on or even decreases sympathetic nervous system responses (Gross, 1998a; Kim & Hamann, 2012; Stemmler, 1997; Shiota & Levenson, 2012; Wolgast et al., 2011), and leads to lesser activation in emotion-generative brain regions such as the amygdala (Goldin et al., 2008; Kanske, Heissler, Schonfelder, Bongers, & Wessa, 2011; Ochsner & Gross, 2008; Ochsner et al., 2004) and ventral striatum (Staudinger, Erk, Abler, & Walter, 2009). Correlational studies suggest that compared to people who do not use reappraisal, people who use reappraisal experience and express more positive emotion and less negative emotion, including fewer depressive symptoms (Gross & John, 2003; Nezlek & Kuppens, 2008). Reappraisers' reports of less negative emotion are corroborated by functional imaging studies that show less activation in emotion-related regions such as the amygdala (Drabant et al., 2009).

*Cognitively*, experimental studies have shown that suppression leads to worse memory (Johns, Inzlicht, & Schmader, 2008; Richards, Butler, & Gross, 2003; Richards & Gross, 1999, 2000, 2006). Correlational findings support these conclusions: Indi-

viduals who typically use suppression have worse memory for emotional interactions than do individuals who use suppression less frequently (Richards & Gross, 2000).

By contrast, experimental studies have found that reappraisal either has no impact on subsequent memory or actually improves it (Richards & Gross, 2000; Hayes et al., 2011), and can enhance performance on standardized exams (Jamieson, Mendes, Blackstock, & Schmader, 2010). Correlational studies bear out these findings, showing that individuals who typically reappraise have comparable or even enhanced memory compared to others (Richards & Gross, 2000).

*Socially*, experimental studies have reported that suppression leads to less liking from social interaction partners, and to an increase in partners' blood pressure levels (Butler et al., 2003). Correlational studies support these laboratory findings. Individuals who typically use suppression report avoiding close relationships and having less positive relations with others; this dovetails with peers' reports that suppressors have relationships with others that are less emotionally close (English, John, & Gross, 2013; Gross & John, 2003; Srivastava, Tamir, McGonigal, John, & Gross, 2009).

Reappraisal, by contrast, has no detectable adverse consequences for social affiliation in a laboratory context (Butler et al., 2003). Correlational studies support these findings: Individuals who typically use reappraisal are more likely to share their emotions—both positive and negative—and report having closer relationships with friends, which matches their peers' reports of greater liking (Gross & John, 2003; Mauss et al., 2011).

Across these three outcome domains, reappraisal seems preferable to suppression. However, caution is required here, because the effects of emotion regulation vary by context. Thus, the 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). Similarly, some of the benefits of reappraisal are moderated by context. For example, if emotional intensity is already high when reappraisal is engaged, it no longer has the experiential or physiological benefits seen in other contexts (Sheppes, Catran, & Meiran, 2009).

The context specificity of the effects of suppression and reappraisal (and, presumably, other forms of emotion regulation) means that global conclusions about one strategy being “better” than another are likely to be misleading. Indeed, any given emotion regulation strategy may be used to make things either better or worse, depending on whose point of view is adopted, on the outcome of interest, and on details regarding the context. For example, cognitive strategies that dampen negative emotions may help a medical professional operate efficiently in stressful circumstances, but they also may neutralize negative emotions associated with empathy and thereby decrease helping. It also bears emphasizing that regulatory strategies may accomplish one person’s goals at the expense of another’s. For example, a mother may accomplish her goals when she stops a child from crying for candy in the supermarket, but this success may come at the expense of the child’s failure to achieve his or her goal of getting candy.

### **Fundamental Questions and Directions for Future Research**

As is the case with any new and vital area of science, the study of emotion regulation has generated many more questions than answers (Gross, 2013). In the following sections, I describe three of the questions I think are particularly important to the field of emotion regulation.

#### ***How Separable Are Emotion and Emotion Regulation?***

One of the most intuitively compelling distinctions in the field of emotion research is that between emotion and emotion regulation. We feel angry, and try not to show it. A child cries, and we comfort her. We are discouraged, and try to find hope. In each case, it seems utterly obvious that one set of psychological processes governs the emergence of an emotion, and another governs whether and how we manage these emotions.

However, the closer one looks, the harder it is to draw a bright line between emotion and emotion regulation (Gross et al., 2011). Many situations seem to call forth both emotion and emotion regulation (Campos,

Frankel, & Camras, 2004), and many of the brain systems that give rise to emotion are also engaged by emotion regulation (Ochsner et al., 2009). This has led some commentators to argue that the two sets of processes are so intertwined that no clear distinction can be made between them (Kappas, 2011; Thompson, 2011).

Part of the problem here is that there are many different ways to define emotion, each of which suggests a different take on how (and whether) emotion and emotion regulation should be distinguished (Gross & Barrett, 2011). From my perspective, the crucial distinction between emotion and emotion regulation is a functional one. As we have seen, an emotion arises when a person attends to a situation that he or she evaluates as relevant to a particular type of goal. For example, I may feel angry at others when they throw garbage from their cars. I may even have an emotion about my anger response. For example, I may feel proud that I feel anger at others who are degrading the environment. Emotion regulation may be said to occur when (1) an emotional response itself is subject to valuation as good or bad, *and* (2) this valuation leads to the activation of a goal to change that particular emotion response trajectory. To continue the earlier example, if I find myself getting so annoyed at others who pollute the environment that I snap at my children, I may negatively value my anger and feel upset that I am snapping at my children. If this is all that happens, there’s no emotion regulation—just two overlapping instances of emotion (anger at polluters, and upset at myself for snapping at my children). But if this feeling of upset leads me to try to curb my anger, then this would be an instance of emotion regulation.

A more general way of putting this idea is to say that emotion regulation involves the valuation of a valuation. That is, an emotional response is itself judged to be good or bad—hence leading to an affective response about the target emotional response—and this second affective response motivates an effort to modify the first affective response. This perspective on emotion regulation is functional in that it doesn’t define a priori what should “count” as emotion versus emotion regulation; instead, the question of separability hinges on whether a goal has been activated to influence the emotion-

generative process itself (for a more detailed exposition of this valuation perspective on emotion regulation, see Ochsner & Gross, this volume).

### **Why Do People Regulate Their Emotions as They Do?**

Anyone who has ever seen two grown men step out of their cars to fight over who is the bigger idiot has likely wondered why on earth the two can't manage to regulate their emotions in more productive ways. This puzzlement points to a more general question about why people regulate (or fail to regulate) their emotions as they do. Answering this question requires a more complete analysis of the emotion regulatory process than I have provided so far, and one of the most pressing challenges for researchers in this area is to contribute to this analysis. In answering this overarching question, a number of more specific questions must be addressed:

1. What leads people to activate a goal to regulate emotion?
2. What determines the fate of this regulatory goal?
3. Which strategy is employed to achieve a given emotion regulatory goal?

Why do some people activate a goal to regulate emotions when others do not? One reason may be differences in awareness of the person's own ongoing (or anticipated) emotional responses—in the case of intrinsic emotion regulation—or in awareness of another person's ongoing (or anticipated) emotional response—in the case of extrinsic emotion regulation. People differ substantially in their ability to track subtle emotion dynamics and represent these in a differentiated fashion; some do this very well, but others (e.g., those who have alexithymia or low levels of emotion awareness) have little or no awareness of ongoing emotional responses (Salovey & Mayer, 1990; Taylor, 1994). Emotional awareness appears to be a crucial rate-limiting factor in successfully regulating emotions (Barrett, Gross, Conner, & Benvenuto, 2001; Samson, Huber, & Gross, 2012), but much remains to be learned about the precise role of emotional awareness in activation of the goal to engage in emotion regulation.

Even after a person has become aware of an emotion and activated a goal to regulate that emotion, there remains the question: What determines how this regulatory goal will fare in its competition with other currently active goals? As discussed earlier, people have both hedonic and instrumental goals, but it is far from clear how these various goals interact. What is known suggests that emotion regulation often involves tradeoffs between hedonic and instrumental motives. Avoidance that may bring short-term relief ("If I skip the cocktail party, I can avoid feeling anxious") may have a substantial long-term price tag ("If I skip the cocktail party, I may miss out on developing helpful professional contacts"). Over the course of development, it appears that the balance of motives shifts repeatedly, first from hedonic to instrumental goals, then, later in life, away from instrumental motives and toward hedonic motives, reflecting an awareness of the reduced value of long-term investments as one moves toward the end of one's life (Carstensen, Isaacowitz, & Charles, 1999; Charles & Carstensen, this volume). Just how people flexibly manage competing regulatory goals is likely to be an important determinant of healthy adaptation.

Once an emotion regulatory goal has been activated and has survived a competition with other currently active goals, there remains the question: Which emotion regulatory strategy (or strategies) will be selected in order to achieve that particular emotion regulatory goal? Part of the answer may hinge on context-specific factors, such as the type and 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, this volume; Sheppes, Scheibe, Suri, & Gross, 2011). Another important context-specific factor may be a person's perceptions of his or her currently available social and/or psychological resources (Coan & Maresh, this volume; Opitz, Gross, & Urry, 2012). Other factors that govern strategy selection may be more stable across situations. For example, some people have incremental beliefs about emotion, and see emotions as the kinds of

things that can be changed. Others have entity beliefs about emotion, and see emotions as relatively immutable. Perhaps not surprisingly, those with incremental beliefs seem to be more adept at emotion regulation than those with entity beliefs (Maus & Tamir, this volume; Tamir, John, Srivastava, & Gross, 2007). Another important kind of belief has to do with whether one believes one is able to engage in a particular form of emotion regulation when one wishes to do so. This type of belief is referred to as *emotion regulation self-efficacy*, and self-efficacy beliefs can be modified. For example, in the context of generalized social anxiety disorder, patients who received cognitive-behavioral therapy (vs. those randomized to a wait-list group) showed increased reappraisal self-efficacy, and these changes in self-efficacy mediated the effects of therapy on clinical improvement (Goldin et al., 2012; John & Eng, this volume).

It is evident that these three questions—regarding the activation of a regulatory goal, the relative dominance of that regulation goal compared to other goals, and the emotion regulation strategy that is selected—represent a small subset of the many questions that need to be answered before we fully understand whether (and how) a particular person will regulate emotion in a particular situation, and whether he or she will do so successfully. Other determinants include person-based factors, such as working memory capacity, as well as situation-based factors that make some forms of emotion regulation easier to implement than others. One pressing challenge for future research is to clarify the rules that govern the skillful application of emotion regulation. This work is important, because it will create a framework for understanding individual and group differences in emotion regulation, and suggest strategies for intervention when regulation is deficient.

### **How Can We Use What We Know to Make the World a Better Place?**

Although we still have much to learn about the psychological processes that are necessary for skillful and flexible emotion regulation, we now know enough to begin thinking about how to use what we know about emotion regulation to make the world a

better place. Efforts in this direction are justified by not only their ends but also what they can teach us about basic processes as we apply what we think we know to real-world situations.

One type of application—and perhaps the most obvious—is individual-level interventions designed to teach healthier patterns of emotion regulation (Gross & Munoz, 1995). Such interventions might take the form of crafting instructional materials, teacher workshops, classroom-based interventions, and parenting classes designed to increase awareness of the importance of emotion and skillful emotion regulation. Interventions may target individuals at heightened risk of adverse outcomes, such as daughters of depressed mothers, children who live in abusive families, members of underrepresented minorities in work or academic contexts, or those with high temperamental levels of negative emotion. More specific interventions will target individuals who have clinical diagnoses (Barrett, Wilson-Mendenhall, & Barsalou, this volume; Campbell-Sills, Ellard, & Barlow, this volume; Joormann & Siemer, this volume; Kober, this volume). These are the inventions that come to mind most easily, and many of our pharmacological and psychosocial interventions for psychiatric disorders have an emotion regulation component, although much remains to be learned about exactly how each type of intervention influences particular aspects of emotion regulation (Berking & Schwarz, this volume; Neacsiu, Bohus, & Linehan, this volume; MacLeod & Grafton, this volume; Mennin & Fresco, this volume; Farb, Anderson, Irving, & Segal, this volume).

A second type of application involves making larger changes in the physical and social worlds in which we live. An example of this class of interventions comes from applying an emotion regulation perspective to seemingly intractable global conflicts (Halperin, 2013). These conflicts are characterized by high levels of negative emotions that powerfully shape attitudes and behaviors of each of the parties to the conflict. In particular, negative intergroup emotions—emotions that arise as a result of belonging to a certain group—can lead to the commencement and maintenance of hostilities, then block progress toward a peaceful solution to the ongoing conflict. 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 to either a reappraisal training condition or a control condition just before the Palestinian United Nations (UN) bid in 2011. Findings indicated that a week following 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 persisted when assessed 5 months after training, and at each time point, negative emotion mediated the effects of reappraisal on conflict-related attitudes (Halperin, Porat, Tamir, & Gross, 2012). These findings hint at the broader, real-world relevance of an emotion regulation perspective, and in future work it will be interesting to investigate how such a perspective might be applied in other arenas.

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