

# Emotion Regulation: Past, Present, Future

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Modern emotion theories emphasise the adaptive value of emotions. Emotions are by no means *always* helpful, however. They often must be regulated. The study of emotion regulation has its origins in the psychoanalytic and stress and coping traditions. Recently, increased interest in emotion regulation has led to crucial boundary ambiguities that now threaten progress in this domain. It is argued that distinctions need to be made between (1) regulation *of* emotion and regulation *by* emotion; (2) emotion regulation in self and emotion regulation in others; and (3) conscious and nonconscious emotion regulation. Using a process model of emotion generation, this review considers promising research on basic processes and individual differences in emotion regulation and poses five theoretical challenges.

## INTRODUCTION

Contemporary conceptions of emotion emphasise emotions' positive role in adaptation (e.g. Lazarus, 1991; Tooby & Cosmides, 1990). Emotions are said to tailor cognitive style to situational demands (Clore, 1994), to facilitate decision-making (Oatley & Johnson-Laird, 1987), to prepare the individual for rapid motor responses (Frijda, 1986), and to promote learning (Cahill, Prins, Weber, & McGaugh, 1994). In addition to these intra-organismic functions, emotions also are thought to have important social functions. For example, emotions are held to provide information about behavioural intentions (Ekman, Friesen, & Ellsworth, 1972; Fridlund, 1994), to give clues as to whether something is good or bad (Walden, 1991), and to flexibly script complex social behaviour (Averill, 1980). Attention to the functions emotions serve has provided a forceful and much-needed counterpoint to the long-standing view of emotions as

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dysfunctional and disruptive (Young, 1943). Indeed, the trend toward functional approaches has gathered such momentum that it now must be asked: Are emotions *ever* to be regulated?

In the past two decades, a new research domain has emerged that is concerned with just this question. The core construct in this domain—emotion regulation—first came into use in the developmental literature in the early 1980s (Campos, Barrett, Lamb, Goldsmith, & Stenberg, 1983; Gaensbauer, 1982). Since this time, emotion regulatory processes have enjoyed increasing attention in both developmental (Campos, Campos, & Barrett, 1989) and adult (Gross, 1998b) literatures, as researchers from a variety of traditions have examined how individuals influence which emotions they have, when they have them, and how they experience and express these emotions. In this article, I first describe two major precursors to the study of emotion regulation: The psychoanalytic tradition and the stress and coping tradition. I then use a process model of emotion generation to provide a framework for studying emotion regulation, and consider several boundary issues. To illustrate contemporary research in this area, I review promising work on basic processes and individual differences in adult emotion regulation. I conclude by considering several theoretical challenges and directions for future research.

## HISTORICAL ANTECEDENTS

Research specifically concerned with emotion regulation is a relatively recent innovation, but an interest in how emotions can and should be regulated is anything but new (Averill, 1982). Philosophers from Socrates on have grappled with the role emotion should play in everyday affairs, and to this day one of the core themes in Western philosophy is the contest between reason and the passions (Solomon, 1976). In the past century, this long-standing interest in emotion regulation has been played out in two principal arenas. Together, these have set the stage for contemporary research on emotion regulation.

### The Psychoanalytic Tradition

One important precursor to the contemporary study of emotion regulation is the psychoanalytic tradition. This tradition emphasises the conflict between biologically based impulses and internal and external restraining factors. However, the association between psychoanalytic approaches and emotion regulation is more intimate than a shared concern with impulse regulation. Indeed, by the end of Freud's career, psychoanalytic theorising relied heavily on the notion of anxiety regulation (Freud, 1926/1959).

Freud used anxiety as a catch-all term for negative emotions (Erdelyi, 1993), and a discussion of his views on anxiety regulation ideally would be couched in a general psychoanalytic theory of affect. Unfortunately, as one commentator put it, any attempt at formulating such a comprehensive psychoanalytic theory is “ill-advised, if not impossible” due to the complex and conflicting discussions of affect in Freud’s writings (Rapaport, 1953, p. 193). Of course, this has not prevented a number of attempts at devising such a psychoanalytic theory of affect (e.g. Basch, 1976; Brenner, 1982; Krystal, 1977; Schwartz, 1987; Spezzano, 1993). Given the current lack of agreement, I focus on anxiety.

Initially, Freud believed that anxiety resulted when libidinal impulses were denied expression (Freud, 1900/1950; 1915/1976). He saw anxiety as epiphenomenal, like steam escaping from a stuck turbine. With the development of the structural model of personality, Freud developed a very different conception of anxiety (Freud, 1926/1959). Freud (1933/1964) argued that the ego alone can produce and experience anxiety, and that realistic, neurotic, and moral anxiety derived from the ego’s relations with reality, the id, and the superego, respectively. Reality-based anxiety was thought to result when the ego was overwhelmed by situational demands. In this case, anxiety regulation took the form of avoiding such situations in the future, even if this meant severe curtailment of behaviour, as in agoraphobia. By contrast, Freud held that id- and superego-based anxiety resulted when impulses pressed for action and the ego anticipated how it would feel if such impulses were expressed. If the ego’s imaginal run-through led to high levels of anxiety, sufficient unpleasure was generated to suppress the impulse (Freud, 1926/1959). In this case, anxiety regulation took the form of curtailing impulses that were judged likely to create future anxiety.

As this summary suggests, anxiety regulation plays a central role in psychoanalytic theorising. This is particularly true in the structural model, where ego defences may be seen as processes that regulate anxiety (Freud, 1926/1959). These processes typically are not conscious—but they may be—and they involve differing levels of reality distortion, behavioural impairment, energy consumption, and unnecessary nongratification of impulses (Fenichel, 1945; A. Freud, 1946; Haan, 1977, Vaillant, 1977). Maladaptive defences are thought to develop as children associate situations or impulses with high levels of anxiety, and learn to regulate this anxiety through idiosyncratic and problematic forms of anxiety regulation (Schwartz, 1987). For example, in the face of wildly inconsistent parenting, children learn to shield themselves from intolerable anxiety and protect their vital links with caregivers (Hofer, 1994). In so doing, they may develop avoidant strategies that have lifelong ramifications for social adjustment. Treatment consists of learning new ways to regulate anxiety,

in part through a “corrective emotional experience” (Alexander, 1950) in which dreaded consequences of impulse expression fail to materialise (Basch, 1976).

*Continuities and Discontinuities.* Contemporary emotion regulation research remains concerned with reducing negative emotion experience through behavioural or mental control. The field of study has broadened, however, to include the ways in which individuals increase and decrease the experience and expression of a range of negative and positive emotions (Parrott, 1993). There also is a growing awareness of the differences between conscious and nonconscious emotion regulatory processes (Mayer & Salovey, 1995). Emotion regulatory styles still are seen as central to psychopathology (Cicchetti, Ackerman, & Izard, 1995; Gross & Munoz, 1995), but there now is greater interest in directly assessing the full range of normal functioning as well (e.g. Catanzaro, 1996). Perhaps the most striking discontinuity, however, is contemporary researchers’ reliance on correlational and experimental methods rather than clinical reports.

## The Stress and Coping Tradition

The second important precursor to contemporary emotion regulation research is the stress and coping tradition. This tradition originated in the work of Cannon (1914), although it was Selye who popularised the notion that organisms produce similar “stress” responses to diverse challenges (Selye, 1956, 1974). This view draws upon an analogy to physical loads that exert a force on natural or man-made structures, resulting in a strain, or deformation of the structure due to the stress (Hinkle, 1974). Importing these notions to the biological realm, Selye argued that stressors impinge upon the organism, which responds by producing a stereotyped stress response, whose profile varies according to whether the stressor is of short duration (alarm), moderate duration (resistance), or long duration (exhaustion).

Interest in stress research grew during World War II, as researchers explored the consequences of war on fighting men (e.g. Grinker & Spiegel, 1945), and continued to gain momentum after the war as attention shifted to the stresses of peacetime. Although early stress research focused on responses to *physical* challenges such as crowding and cold, researchers soon began to explore responses to *psychological* stressors as well. The study of psychological stress led to an emphasis on the cognitive processes required to transform an external event into something with adaptive significance for the individual (Lazarus, 1966). This led to distinctions among: (a) how the situation was evaluated (primary appraisal);

(b) how the organism viewed its own capacities to respond (secondary appraisal); and (c) how the organism attempted to manage the troubled organism-environment relation that occasioned the stress (coping). Stress was defined as “a relationship between the person and the environment that is appraised by the person as relevant to his or her well-being and in which the person’s resources are taxed or exceeded”, and coping was defined as “cognitive and behavioral efforts to manage (master, reduce, or tolerate) a troubled person-environment relationship” (Folkman & Lazarus, 1985, p. 152).

Initially, commonalities were emphasised across situations ranging from the ordinary, such as taking an exam (Mechanic, 1962) to the extraordinary, such as being trapped in a coal mine (Lucas, 1969). With time, researchers began to distinguish among stressors. Lazarus (1966) defined *harm* as a form of stress associated with damage that has been done, *threat* as a form of stress associated with future harm, and *challenge* as a form of stress associated with positive responding. Likewise, Selye (1974) distinguished between *eustress*—a form of stress association with good feelings, and *distress*—a form of stress associated with bad feelings. Distinctions also were made among coping responses, such as Lazarus and colleagues’ distinction between *problem-focused coping*, which was aimed at fixing the problem, and *emotion-focused coping*, which was aimed at lessening negative emotion experience. It was this last construct, in particular, that laid the groundwork for the study of emotion regulation.

*Continuities and Discontinuities.* Researchers long have bemoaned the conceptual confusion associated with the term stress (e.g. Haan, 1993; Hobfoll, 1989). The problem is that “stress” covers such an extraordinary range of phenomena that many have concluded that “the term is meaningless” (Levine & Ursin, 1991, p. 3). Likewise, coping now seems to include the full range of behaviour emitted by an individual in taxing circumstances (Costa, Somerfield, & McCrae, 1996). Emotion regulation researchers have sought finer-grained distinctions among environment-organism interactions than are possible under the broad rubric of stress, using either dimensional (Davidson, 1992; Lang, 1995) or discrete (Ekman, 1992) approaches. On the coping side, too, emotion regulation researchers are focusing increasingly on specific emotion regulatory processes such as rumination (Nolen-Hoeksema, 1993), suppression (Gross, 1998a), and downward social comparison (Aspinwall & Taylor, 1993). Of the two terms—coping and emotion regulation—coping is the broader category, as it includes nonemotional actions taken to achieve nonemotional goals (Scheier, Weintraub, & Carver, 1986), such as buying a map in order to navigate a new city. Coping also differs

from emotion regulation in that the unit of analysis is typically longer—extended periods of hours, days, or months rather than seconds or minutes. Thus, for example, one might speak of coping with adjustment to freshman year of college, or coping with the loss of one's spouse. However, coping does not entirely subsume emotion regulation: Emotion regulation includes processes not typically considered in the coping literature, such as regulating expressive or physiological aspects of emotion, or influencing positively valenced emotions.

## CONTEMPORARY CONCERNS

With psychoanalytic and stress and coping traditions as a backdrop, emotion regulation research has emerged as a relatively distinct domain over the past two decades (Gross, 1998b). Paramount concerns include defining emotion and emotion regulation, and delineating individuals' emotion regulatory goals and strategies.

### Defining Emotion

From an evolutionary perspective, emotions—like many of our physical attributes and psychological processes—represent time-tested solutions to adaptive problems (Tooby & Cosmides, 1990). In particular, emotions are thought to have arisen because they efficiently co-ordinate diverse response systems, thereby helping us respond to important challenges or opportunities (Levenson, 1994). Take fear, for example. When we are afraid, our senses are sharpened, our muscles are primed to move us quickly out of harm's way, and our cardiovascular system is tuned to provide increased oxygen and energy to large muscle groups that will be called upon when we flee. These emotional reactions typically are short-lived, and involve changes in subjective experience, expressive behaviour, and central, autonomic and endocrine response systems (Lang, 1995). Different emotions are thought to address different adaptive problems (e.g. Ekman, 1992; Izard, 1977; Plutchik, 1980), although there is currently lively debate about the extent to which each emotion calls forth distinguishable, cross-situationally consistent physiological (Cacioppo, Klein, Berntson, & Hatfield, 1993; Levenson, 1992; Zajonc & McIntosh, 1992) and behavioural (Ekman, 1994; Frijda, 1986; Russell, 1994) responses. If "affect" is used to refer to valenced ("good-bad") reactions to stimuli or situations that are meaningful to the individual (Scherer, 1984), emotions are part of the larger affective family that also includes: (a) *stress responses* to taxing circumstances; (b) *emotion episodes* such as a bar-room brawl and delivering bad news to a close friend; and (c) *moods* such as depression and euphoria.

## Defining Emotion Regulation

The phrase “emotion regulation” is ambiguous, as it might refer equally well to how emotions regulate something else—such as thoughts or behaviour—or to how emotions are themselves regulated (Dodge & Garber, 1991). However, if a primary function of emotion is to co-ordinate diverse response systems (Campos et al., 1983), the first sense of emotion regulation is largely redundant with emotion. For this reason, I believe that the second usage is preferable, in which emotion regulation refers to the heterogeneous set of processes by which emotions are themselves regulated. Because virtually all goal-directed behaviour can be construed as maximising pleasure or minimising pain—and thus affect regulatory in some broad sense—it is important to prevent over-inclusivity by narrowing the focus to processes whose proximal function is to regulate emotion.

A second important distinction is suggested by researchers’ use of emotion regulation to refer both to how individuals influence their own emotions and to how they influence other people’s emotions. This practice leads to discussions in which stifling one’s own tears and telling someone else to stop acting like a crybaby are both considered instances of emotion regulation. This usage is particularly common in the developmental literature (e.g. Masters, 1991; Thompson, 1994), but it is also evident in the adult literature (Gross & Levenson, 1993; Salovey, Hsee, & Mayer, 1993). I now believe this double usage is unfortunate, as it mixes two potentially quite different sets of motives, goals, and strategies. Both kinds of emotion regulation must be examined, but in doing so, the two should be clearly distinguished. In the following, I focus on emotion regulation in the self, by which I mean the ways individuals influence which emotions they have, when they have them, and how they experience and express these emotions. In colloquial usage, emotion is often used interchangeably with the subjective experience of emotion, and emotion regulation thus might be thought to necessarily involve changes in subjective experience. However, there is general consensus among emotion researchers that emotions are multicomponential—spanning experiential, behavioural, and physiological domains. Emotion regulation thus involves changes in one or more of these responses systems and need not (but certainly can) involve attempts to change the subjective experience of emotion.

A third distinction concerns whether emotion regulation is conscious or nonconscious (Masters, 1991; Mayer & Salovey, 1995). Prototypic examples of emotion regulation are conscious, such as deciding to change an upsetting topic, or squelching laughter at a child’s inappropriate antics. One might imagine, however, emotion regulatory activity occurring without conscious awareness, such as when well-practised routines become automated. Examples include hiding one’s disappointment at an unattractive

present (Cole, 1986), lighting a cigarette when anxious (Brandon, 1994), or even cracking a joke to relieve tension (Fredrickson & Levenson, 1998). Previous discussions have favoured a categorical distinction between conscious and unconscious processes, but it probably is more useful to think of a continuum of processes that vary in the degree to which they are controlled, effortful, and conscious versus automatic, effortless, and unconscious. Clarity about the nature of processes under investigation is essential because there may be important differences in the antecedents and consequences of emotion regulatory processes characterised by differing levels of consciousness (Wegner & Bargh, 1998).

## Emotion Regulatory Goals

An evolutionary perspective holds that emotions encode situation-response dependencies that have proven valuable over the sweep of millennia (Tooby & Cosmides, 1990). This in no way implies, however, that emotion response tendencies are always—or even usually—appropriate to the situations we now face. Physical and social environments have changed out of all recognition from those that shaped our emotions, and technological advances have dramatically magnified the consequences that our emotional responses may have for ourselves and others. An irritable swipe that once scarcely raised a welt, is now translated with the greatest ease into a fatal car accident or gun-related homicide.

However real the many benefits of emotion, then, it is important not to overstate the advantages of acting in accord with untrammelled emotional impulses (Parrott, 1995). Indeed, when one surveys the causes of human dysfunction and suffering, one is struck by the degree to which emotions lead us to do things that cause suffering to ourselves and those around us, whether through impulsive aggressive action, hasty business decisions, or deceitful sexual liaisons. Particularly when emotions are viewed as arising at moments of challenge or opportunity, the importance of proper regulation is unmistakable.

We know relatively little about individuals' emotion regulatory goals, but it seems increasingly clear that emotion regulation involves both decreasing and increasing negative and positive emotions (Langston, 1994; Masters, 1991; Parrott, 1993). Emotion regulation that involves *decreasing* emotions may occur when: (a) emotions prompt behavioural responses that are no longer useful, such as physically attacking an irritating subordinate; (b) emotions arise from an overly simple appraisal of the situation, such as mistaking a stick for a snake; or (c) emotion response tendencies conflict with other important goals, such as saving one's skin by fleeing a fight versus saving face by standing one's ground. Emotion regulation that involves *initiating or increasing* emotions may occur



when: (a) emotion response tendencies are lacking because one's mind is elsewhere, but one wishes to muster an appropriately enthusiastic response to another's good news; or (b) one desires to replace one emotion with another, such as when one is feeling down, and one wants to summon a more positive emotional state before calling on friends. One research priority is to develop a better understanding of what individuals are trying to accomplish when they regulate their emotions, keeping in mind that emotion regulatory goals may be nonconscious, and that they are likely to be highly context-sensitive—such as matching the emotional state of an anticipated interaction partner (Erber, Wegner, & Theriault, 1996).

## Emotion Regulatory Processes

What individuals want to achieve as they influence their emotions—their emotion regulatory goals—must be distinguished from the processes they invoke in order to achieve these goals. One way to organise these emotion regulatory processes is by drawing on a consensual process model of emotion generation. This model is a distillation of major points of convergence among emotion researchers who emphasise biological bases of emotion (major contributors to this tradition include: Arnold, 1960; Buck, 1985; Ekman, 1972; Frijda, 1986; Izard, 1977; Lazarus, 1991; Plutchik, 1980; Scherer, 1984; Tomkins, 1962). According to this model, emotion begins with an evaluation of external or internal emotion cues. Certain evaluations trigger a co-ordinated set of behavioural, experiential, and physiological emotion response tendencies. These response tendencies may be modulated, and it is this modulation that gives final shape to manifest emotional responses.

Using this scheme, emotion regulatory processes may be seen as targeting one or more of five points in the emotion-generative process (Gross, 1998b). First, regulatory strategies may act on the situation itself. The most forward-looking approach might be called *situation selection*. This refers to approaching or avoiding certain people or situations on the basis of their likely emotional impact; Scarr and McCartney (1983) have called this niche picking. Once one is in an emotion-eliciting situation, *situation modification* is still possible. This refers to modifying the local environment so as to alter its emotional impact. Situation selection and situation modification help shape the individual's situation. However, it also is possible to regulate emotions without actually changing the environment. Situations have many aspects, and *attentional deployment* refers to how individuals direct their attention within a given situation in order to influence their emotions. This includes attentional strategies ranging from distraction, which focuses on nonemotion-relevant aspects of the situation, or shifts attention away from the immediate situation altogether (Derryberry & Rothbart, 1988) to

rumination, which focuses attention on the situation and its emotional implications (Nolen-Hoeksema, 1993). Even after a situation has been selected, modified, and selectively attended to, it still is possible to alter its emotional impact. *Cognitive change* refers to evaluating the situation one is in 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. *Response modulation* refers to influencing emotion response tendencies once they arise. Everyday experience is replete with efforts to manipulate emotion-expressive behaviour, such as hiding anger at an offensive remark, as well as physiological responding, such as slowing one's breathing rate. It is less certain whether emotion experience can be modified directly, although cognitive, behavioural, and pharmacologic means all may be used to modify emotion experience indirectly.

## CONTEMPORARY RESEARCH

A growing sense of shared purpose in the domain of emotion regulation has led to greater contact between previously disparate research programs. In the following sections, I illustrate current emotion regulation research by describing promising research on basic processes and individual differences in adult emotion regulation (for a review of the literature on emotion regulation in children, see Thompson, 1990). Reflecting the bias in contemporary research, my focus is on the regulation of negative emotions.

### Basic Processes

A variety of emotion regulatory processes have attracted attention, including: Recalling mood-incongruent memories (Parrott & Sabini, 1990; Smith & Petty, 1995), helping others (Schaller & Cialdini, 1990), exercising (Thayer, Newman & McClain, 1994), seeking social support (Rippere, 1977), using drugs (Morris & Reilly, 1987), and making social comparisons (Taylor & Lobel, 1989). In the following, I focus on two basic processes—reappraisal and suppression—that represent two major points in the emotion generative process at which emotions can be regulated (Gross, 1998b).

*Reappraisal.* It is widely agreed that a situation typically does not in and of itself generate emotion. Rather, it is the individual's evaluation of that situation that is emotion-generative. One powerful means of emotion regulation, therefore, is to modify the way a situation is evaluated. Such reappraisals may decrease emotional responding, as when one imagines that graphic news footage has been faked, or increase emotional responding, as when one reinterprets a joke as a thinly veiled insult. Reappraisal

plays a key role in theories of emotion (e.g. Lazarus, 1991) and stress reduction (e.g. Katz & Epstein, 1991; Meichenbaum, 1985). Unfortunately, despite its wide currency, even the hypothesis that cognitive strategies may be used to decrease negative emotion—which is what we know most about—has a surprisingly modest empirical foundation. Leading subjects to reappraise negative emotion-eliciting films has been shown to decrease negative emotion experience (Cantor & Wilson, 1984; Dandoy & Goldstein, 1990; Gross, 1998a; Lazarus & Alfert, 1964). However, concomitant decreases in physiological responding are often not observed (e.g. Gross, 1998a; Steptoe & Vogeley, 1986). Why might this be? One possibility is that cognitive appraisals play a limited role in the generation of physiological response tendencies in the context of graphic surgery films (LeDoux, 1989). If so, reappraisal might be expected to be more effective in complex social situations. Indeed, Stemmler (1997) has shown that reappraisal instructions led to decreased physiological responding for subjects who an experimenter verbally harassed. One important direction for future research is to use reappraisal as a probe to clarify the nature of cognitive processing in emotion generation and regulation.

*Suppression.* Contemporary interest in the effects of inhibiting emotion-expressive behaviour can be traced to William James. On James' (1884) view, emotion-expressive behaviour was so important to emotion that going through the outward motions of an emotional state could give rise to that feeling, and limiting expressive behaviour could decrease the associated feelings. One variant of this hypothesis came to be known as the "facial feedback hypothesis" (Buck, 1980). Most studies designed to test this hypothesis concentrated on the emotion generation aspect of the hypothesis, and indeed, initiating emotion-expressive behaviour seems to increase the feeling of that emotion slightly (Matsumoto, 1987). Fewer studies have tested predictions regarding the suppression of ongoing emotional behaviour, as it was assumed that inhibiting ongoing emotion expressive behaviour would simply have the opposite effects from voluntarily producing emotion-expressive behaviour (Gross & Levenson, 1993). However, results to date do not support the view that suppression is the simple opposite of exaggeration. What is known suggests that inhibiting expressive behaviour decreases self-reported experience of some emotions (e.g. pain, pride, and amusement), but not others (e.g. disgust, sadness) (for a review, see Gross & Levenson, 1997). Physiologically, inhibiting expressive behaviour while waiting for a painful shock leads to decreased skin conductance reactivity (Colby, Lanzetta, & Kleck, 1977; Lanzetta, Cartwright-Smith, & Kleck, 1976), but the effects of inhibiting emotional responses to other negative stimuli have included signs of increased sympathetic activation (Gross, 1998a; Gross & Levenson, 1993, 1997).

Future research should explore the extent to which the inhibition of expressive behaviour has consistent effects across emotions, and test whether these effects are similar to those of attempting to inhibit other aspects of the emotional response, such as emotional experience.

## Individual Differences

Emotion regulation always takes place in the context of a particular individual. Because individuals differ both in the emotions they experience and in the way they regulate these emotions, any separation between the study of basic emotion regulatory processes and individual differences in such processes must be regarded as a temporary convenience rather than a long-term strategy (see Gross, in press). However, one major impediment to taking a process-oriented approach to personality is that individual differences in emotion regulation have been studied under a disconcertingly large number of rubrics. Constructs most closely related to emotion regulation include: Emotional control (Roger & Najarian, 1989), negative mood regulation (Catanzaro, 1996), repression (Weinberger, 1990), and rumination/distraction (Nolen-Hoeksema, 1993). Related constructs include: monitoring/blunting (Miller, 1987), sensation seeking (Zuckerman, 1979), constructive thinking (Epstein & Meier, 1989), impulsivity (Eysenck & Eysenck, 1969), behavioural inhibition (Kagan, Reznick, & Gibbons, 1989), constraint (Tellegen, 1985), ambivalence over emotional expressivity (King & Emmons, 1990), delay of gratification (Mischel, 1974), alexithymia (Taylor, Bagby, & Parker, 1997), coping style (Carver, Scheier, & Weintraub, 1989), ego control (Block & Block, 1980), and emotional intelligence (Salovey & Mayer, 1990). Rather than attempting a comprehensive review, I illustrate recent research on individual differences in emotion regulation by focusing on two well-studied individual differences—rumination and repression—that were selected to represent conscious and nonconscious emotion regulatory processes that vary diametrically in their use of attention.

*Rumination.* This refers to “behaviours and thoughts that focus one’s attention on one’s depressive symptoms” (Nolen-Hoeksema, 1991, p. 569). Examples include dwelling on problems one is having at work, focusing on feelings of tiredness or bodily pains, and worrying about having yet another sleepless night. When assessed by Nolen-Hoeksema’s Response Styles Questionnaire (Nolen-Hoeksema & Morrow, 1991), dispositional rumination has moderate stability over periods as long as one year (Just & Alloy, 1997). Rumination is effortful, controlled, and conscious, and seems to be aimed at reducing depressive feelings, although its actual effect is usually the opposite. Higher levels of dispositional rumination

are associated with greater likelihood of developing depressive symptoms (Just & Alloy, 1997; Nolen-Hoeksema, Parker, & Larson, 1994), more severe depressive symptoms (Just & Alloy, 1997; Nolen-Hoeksema & Morrow, 1991; Nolen-Hoeksema, Morrow, & Fredrickson, 1993), and longer depressive episodes (Nolen-Hoeksema, 1993; Nolen-Hoeksema, McBride, & Larson, 1997). In the context of an analysis of sex differences in depression, Nolen-Hoeksema (1993, p. 308) has argued that "it is more efficient and potentially useful to focus on people's styles of responding to the specific mood states than to utilize more global constructs". However, from a broader emotion regulatory perspective, one might expect that rumination in the context of other emotional states such as anger, guilt, or anxiety would have comparable consequences in terms of producing more intense and longer-lasting episodes of each of these emotions. Exploring individual differences in rumination with other emotional states is a clear research priority in this area.

*Repression.* Since the 1950s, hundreds of studies have examined the repressive coping style, and there recently has been a renaissance of interest in this construct (Egloff & Krohne, 1996). In contrast to the controlled attention to depressive feelings that characterises rumination, repression appears to be an automatic attentional defence against unpleasant stimuli (Bonanno & Singer, 1990) and accompanying affective arousal (Krohne, 1996), possibly involving increased attention to pleasant thoughts (Boden & Baumeister, 1997, but see McFarland & Buehler, 1997). Repressive tendencies are typically operationalised as low scores on a trait anxiety measure in combination with high scores on a social desirability measures that taps defensiveness (Weinberger, Schwartz, & Davidson, 1979). Clinician judgements of defensiveness also have been used (Shedler, Mayman, & Manis, 1993). Repressors report feeling low levels of anxiety (by definition), and these reports may reflect less frequent negative emotion experience. Interestingly, repressors' *capacity* for negative emotion experience appears undiminished, although they do lack the secondary emotions that usually accompany an emotion experience (Davis, 1987; Egloff & Krohne, 1996; Hansen & Hansen, 1988). Behaviourally, repressors show decreased expressive behaviour (Levenson, Mades, & Meek, 1980), although this inhibition of expressive behaviour may not be evident when subjects do not know they are being observed (e.g. Asendorpf & Scherer, 1983). Physiologically, repressors tend to be more aroused physiologically than other subjects who report low anxiety, as shown by greater frontalis region electromyographic (EMG) activity (Weinberger et al., 1979), increased cortisol levels (Brown et al., 1996), and increased sympathetic activation (e.g. Kohlmann, Weidner, & Messina, 1996; Levenson et al.,

1980; Newton & Contrada, 1992; Weinberger, 1990). Future research will be needed to clarify repressors' typical patterns of emotional experience and expression, and to assess more precisely where in the emotion-generative process repressors regulate emotion.

## THEORETICAL CHALLENGES AND FUTURE DIRECTIONS

This selective review of recent research demonstrates the integrative power of the construct of emotion regulation. Apparently disparate concerns are brought under one roof, helping to sharpen questions about points of convergence and divergence among processes. However, the notion of emotion regulation also poses a number of serious theoretical challenges. In the following sections, I discuss five of the most pressing of these challenges, and suggest a number of directions for future research.

### What Is Regulated in Emotion Regulation?

Thompson (1994) raises the important question as to what is regulated in emotion regulation. I have suggested that emotion regulation involves changes in behavioural, experiential, and/or physiological responses. Because emotions unfold over time, these changes involve alterations in "emotion dynamics" (Thompson, 1990), or the latency, rise time, magnitude, duration, and offset of responses in one or more domains. Emotion regulation also may involve changes in how response components are interrelated as the emotion unfolds over time, such as when large increases in physiological responding occur in the absence of overt behaviour. However, emotion response components are notoriously loosely interknit (Lang, Rice, & Sternbach, 1972), and inferences about emotion regulation based on discrepancies across response channels must be made with caution. Specifying precisely what is regulated—and whether emotion regulation has taken place at all—is one of the most serious challenges this area faces. To meet this challenge, we need a more complete understanding of the relations among emotion response components both when individuals regulate and when they do not regulate their emotions.

### How Can One Tell When Emotion Is Regulated?

Defining emotion regulation in terms of changes in emotion responses begs the question: Changes compared with what? Presumably, emotion regulation may be inferred when an emotional response would have proceeded in

one fashion, but instead proceeds in another. Inferences such as these are fraught with danger. An expressionless face in someone who typically gesticulates wildly at the slightest excuse may be rich with meaning, but that same lack of expression in someone who rarely shows any sign of emotion is much less strongly suggestive of emotion regulation. Also, as attempts at eliciting emotion in the laboratory have amply demonstrated, emotional responses vary as a function of subtle environmental cues (Gross & Levenson, 1995). This means that emotion regulation cannot be inferred unless the situation as perceived by the individual should have elicited a different emotion response profile than the one that was shown. Emotion regulation thus requires a formidable level of certainty about emotion in its unregulated state. Without this, discussions of emotion regulation become postdictions that can explain any pattern of findings (Kappas, 1996). This is particularly true when emotion regulation is invoked to explain a lack of emotion where emotion might be expected, in which case two hidden processes—emotion and emotion regulation—are invoked to explain to a nonresponse (Frijda, 1986). Little is known about the complexities of normative emotional responding, let alone the effects of dispositional variables, such as neuroticism (Gross, Sutton, & Ketelaar, 1998), and group differences, such as sex (Kring & Gordon, 1998). This means that at best, probabilistic statements can be made about emotion regulation in any given case. To specify when—and whether—emotion regulation has occurred, much more will need to be learned about basic emotional responses.

## Is Emotion Ever Not Regulated?

Processes subserving emotion regulation are tightly intertwined with those involved in emotion generation. Indeed, some theorists have responded to this interdigitation of emotion-regulatory and emotion-generative processes by arguing that emotion regulation is part and parcel of emotion (Frijda, 1986). After all, adult emotion is almost always regulated in one way or another (Tomkins, 1984), and it now appears that classically conditioned responses are not erased when they are extinguished, but rather suppressed (Morgan, Romaski, & LeDoux, 1993). If emotion centres in the limbic system are tonically restrained by other brain regions such as the prefrontal cortex (Stuss & Benson, 1986), doesn't the term emotion regulation lose its value? I would argue that the question "Is emotion ever *not* regulated?" is misleading, in that it suggests an all-or-none affair. A conception of relative regulation seems more appropriate. Given the wide range of neural processes implicated in emotion, however, it will be a challenge to draw a clear line between emotion and emotion regulation.

## What Level of Analysis Should Be Used?

Some researchers have assessed the consequences of one or two specific forms of emotion regulation, in one emotional context, using a focused set of response measures (e.g. Nolen-Hoeksema, 1993). Others have examined emotion regulation in far more general terms using a broad array of response measures (Eisenberg et al., 1995). In my own multimethod work on emotion suppression (Gross, 1998a; Gross & Levenson, 1993, 1997), I have been more impressed with similarities than differences in the effects of emotion suppression across emotions, but one important difference has emerged, in that suppressing positive emotion-expressive behaviour such as amusement, decreases amusement experience, whereas suppressing negative emotion-expressive behaviour does not have comparable effects. One important direction for future research is to chart the immediate and longer-term consequences of different forms of emotion regulation in the context of different emotional states.

## How Does Emotion Regulation Relate to Other Forms of Impulse Regulation?

Emotional impulses are by no means the only impulses with which we must contend. One pressing question is how emotion regulation relates to other forms of regulation, such as mood regulation (Carver & Scheier, 1990; Thayer, 1996), thought control (Wegner, 1994), and still other forms of impulse regulation (Baumeister & Heatherton, 1996; Block & Block, 1980). Initial evidence suggests modest correlations among measures of impulse regulation in children (Kopp, 1982; Reed, Pien, & Rothbart, 1984) and adults (King, Emmons, & Woodley, 1992). Given the emerging consensus that discrete and dimensional levels of analysis are compatible rather than in competition with one another, models of emotion regulation and mood regulation eventually may take their place in superordinate models of affect regulation. It seems reasonable, however, to maintain distinctions between processes that regulate emotion, on the one hand, and those that regulate thoughts (e.g. Wegner & Bargh, 1998) or well-learned operant responses (e.g. Logan, Schachar, & Tannock, 1997) on the other. It is less obvious whether processes that regulate emotional impulses should be distinguished from those that regulate impulses associated with hunger, thirst, aggression, and sexual arousal (Buck, 1985). These issues seem certain to attract continued interest, as researchers from a variety of home domains (e.g. weight loss, substance abuse, aggression, emotion regulation: see Baumeister & Heatherton, 1996) begin to fashion stronger empirical links across diverse forms of self-regulation.



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