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# Emotion Regulation in Adulthood: Timing Is Everything

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## *Abstract*

Emotions seem to come and go as they please. However, we actually hold considerable sway over our emotions: We influence which emotions we have and how we experience and express these emotions. The process model of emotion regulation described here suggests that how we regulate our emotions matters. Regulatory strategies that act early in the emotion-generative process should have quite

different outcomes than strategies that act later. This review focuses on two widely used strategies for down-regulating emotion. The first, reappraisal, comes early in the emotion-generative process. It consists of changing how we think about a situation in order to decrease its emotional impact. The second, suppression, comes later in the emotion-generative process. It involves inhibiting the outward signs of emotion. Theory and re-

search suggest that reappraisal is more effective than suppression. Reappraisal decreases the experience and behavioral expression of emotion, and has no impact on memory. By contrast, suppression decreases behavioral expression, but fails to decrease the experience of emotion, and actually impairs memory. Suppression also increases physiological responding in both the suppressors and their social partners.

## *Keywords*

emotion; mood; regulation

Some goon in a sports car careens across your lane. You brake hard. You feel like yelling, throw-

ing something, or even ramming that idiot. Do you? Probably not. Instead, you *regulate* your emotions, and do something else that you think is more appropriate. Psychological research on emotion regulation examines the strategies we use to influence which emotions we have and how we experience and express these emotions. This research grows out of two earlier traditions, the psychoanalytic tradition and the stress and coping tradition (Gross, 1999b).<sup>2</sup> In this review, I describe a process model of emotion regulation that distinguishes two major kinds of emotion regulation. I illustrate each by focusing on two common forms of emotion down-regulation—reappraisal and suppression—and demonstrate how these two regulation strategies differ in their affective, cognitive, and social consequences.

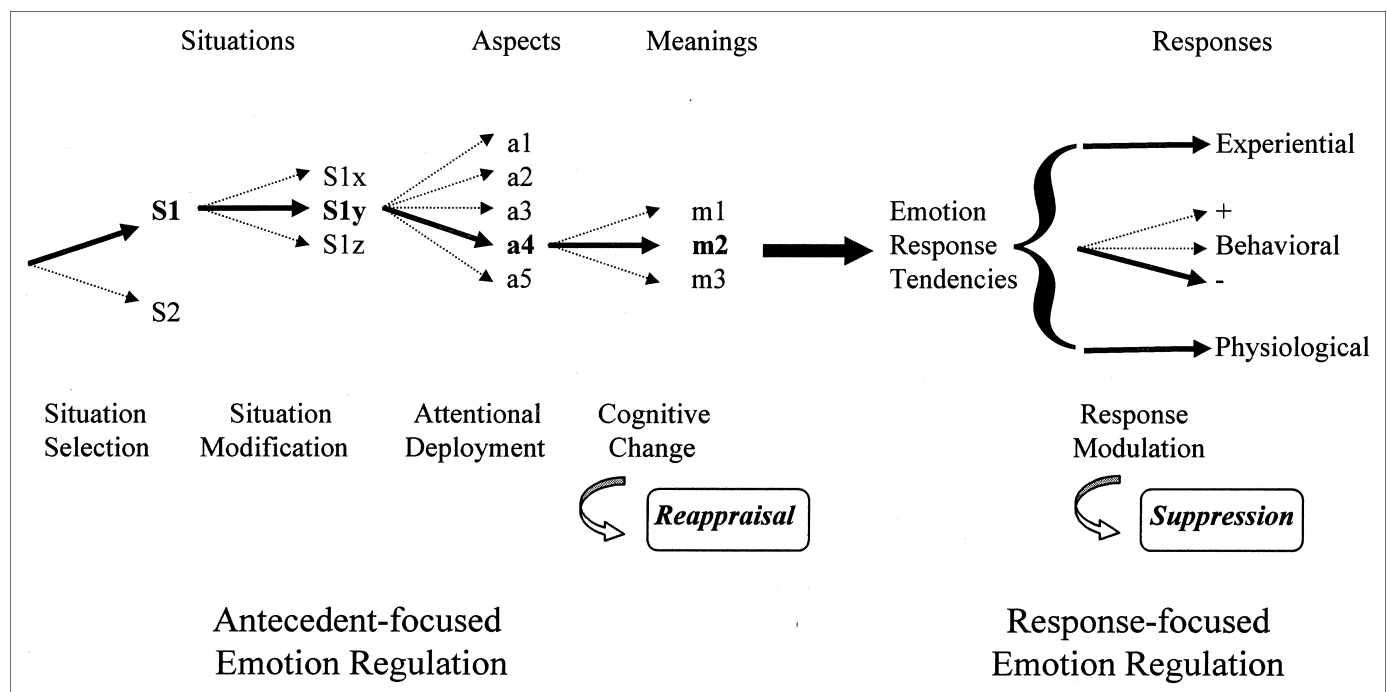
### A PROCESS MODEL OF EMOTION REGULATION

Emotion regulation includes all of the conscious and nonconscious strategies we use to increase, maintain, or decrease one or more components of an emotional response (Gross, 1999a). These components are the feelings, behaviors, and physiological responses that make up the emotion.

A moment's reflection suggests there are many ways to go about regulating emotions. How can we make sense of the potentially limitless number of emotion-regulation strategies? According to my process model of emotion regulation (Gross, 1998b), specific strategies can be differentiated along the timeline of the unfolding emotional response. That is, strategies differ in *when* they have their pri-

mary impact on the emotion-generative process, as shown in Figure 1.

At the broadest level, we can distinguish between *antecedent-focused* and *response-focused* emotion-regulation strategies. Antecedent-focused strategies refer to things we do before response tendencies have become fully activated and have changed our behavior and physiological responses. An example of antecedent-focused regulation is viewing an admissions interview at a school you have applied to as an opportunity to see how much you like the school, rather than a test of your worth. Response-focused strategies refer to things we do once an emotion is already under way, after response tendencies have been generated. An example of response-focused regulation is keeping a poker face while holding a great hand during an exciting card game.



**Fig. 1.** A process model of emotion regulation. According to this model, emotion may be regulated at five points in the emotion-generative process: (a) selection of the situation, (b) modification of the situation, (c) deployment of attention, (d) change of cognitions, and (e) modulation of experiential, behavioral, or physiological responses. The first four of these processes are antecedent-focused, and the fifth is response-focused. The number of response options shown at each of these five points in the illustration is arbitrary, and the heavy lines indicate the particular options selected in the example given in the text. Two specific emotion-regulation strategies—reappraisal and suppression—are the primary focus of this review (Gross, 1998b).

As shown in Figure 1, five more specific emotion-regulation strategies can be located within this broad scheme. The first is *situation selection*, illustrated in Figure 1 by the solid arrow pointing toward Situation 1 (S1) rather than Situation 2 (S2). For example, you may decide to have dinner with a friend who always makes you laugh the night before a big exam (S1), rather than going to the last-minute study session with other nervous students (S2).

Once selected, a situation may be tailored so as to modify its emotional impact (e.g., S1x, S1y, and S1z in Fig. 1). This constitutes *situation modification*. For example, at dinner, if your friend asks whether you are ready for the exam, you can make it clear that you would rather talk about something else.

Third, situations have different aspects (e.g., a1–a5 in Fig. 1), and *attentional deployment* is used to select which aspect of the situation you focus on. An example is distracting yourself from a conversation that has taken an upsetting turn by counting ceiling tiles.

Once you have focused on a particular aspect of the situation, *cognitive change* refers to selecting which of the many possible meanings (e.g., m1–m3 in Fig. 1) you will attach to that aspect. For example, if your upcoming test is mentioned during the dinner conversation, you might remind yourself that "it's only a test," rather than seeing the exam as a measure of your value as a human being. The personal meaning you assign to the situation is crucial because it determines which experiential, behavioral, and physiological response tendencies will be generated.

Finally, *response modulation* refers to attempts to influence these response tendencies once they have been elicited, illustrated in Figure 1 by the solid arrow pointing toward decreasing expressive behavior. In our example, response

modulation might take the form of hiding your embarrassment after bombing the exam. It might also take the form of altering experiential or physiological components of emotion.

### CONTRASTING TWO FORMS OF EMOTION REGULATION: REAPPRAISAL AND SUPPRESSION

Antecedent-focused strategies change the emotion trajectory very early on. By contrast, response-focused strategies occur after response tendencies have already been generated. This difference in timing predicts rather different consequences for these two kinds of emotion regulation. To test this idea, my colleagues and I have focused on two specific strategies used to down-regulate emotion. One is *reappraisal*. As shown in Figure 1, this is a type of cognitive change, and thus antecedent-focused. Reappraisal means that the individual reappraises or cognitively reevaluates a potentially emotion-eliciting situation in terms that decrease its emotional impact. The second strategy we have focused on is *suppression*, a type of response modulation, and thus response-focused. Suppression means that an individual inhibits ongoing emotion-expressive behavior.<sup>3</sup> In the following sections, I describe our findings concerning the affective, cognitive, and social consequences of reappraisal and suppression.

#### Affective Consequences of Emotion Regulation

Reappraisal occurs early in the emotion-generative process and involves cognitively neutralizing a potentially emotion-eliciting situation. Thus, reappraisal should decrease experiential, behavioral, and

physiological responding. By contrast, suppression occurs later and requires active inhibition of the emotion-expressive behavior that is generated as the emotion unfolds. Thus, suppression should not change emotion experience at all, but should increase physiological activation as a result of the effort expended in inhibiting ongoing emotion-expressive behavior.

To test these predictions, we needed to elicit emotion in the laboratory. Researchers have used a variety of methods, including music, obnoxious confederates, and films, to elicit emotion. Films have the advantage of being readily standardized, and of provoking high levels of emotion in an ethically acceptable way (Gross & Levenson, 1995). To examine the affective consequences of emotion regulation, we used a short film that showed a disgusting arm amputation (Gross, 1998a). In the reappraisal condition, participants were asked to think about the film they were seeing in such a way (e.g., as if it were a medical teaching film) that they would not respond emotionally. In the suppression condition, participants were asked to hide their emotional reactions to the film. In the natural condition, participants simply watched the film.

As expected, suppression decreased disgust-expressive behavior, but also increased physiological activation. For example, participants in the suppression condition had greater constriction of their blood vessels than participants in the natural condition. Like suppression, reappraisal decreased expressive behavior. Unlike suppression, however, reappraisal had no observable physiological consequences.<sup>4</sup> Another predicted difference was that reappraisal decreased the experience of disgust, whereas suppression did not.

Related studies have confirmed and extended these findings. In-

creases in physiological activation also have been found when participants suppress amusement and sadness (Gross & Levenson, 1993, 1997). Note that there are no such increases in physiological activation when people "suppress" during a neutral film. This shows that the physiological impact of suppression grows out of pitting attempts to inhibit expression against strong impulses to express. Absent a stimulus that produces emotional impulses, suppression has no impact on physiological responding. The finding that reappraisal decreases emotional responding has recently been replicated using a behavioral measure (the magnitude of a startle response to a loud noise burst) as an index of emotional state (Jackson, Malmstadt, Larson, & Davidson, 2000).

### **Cognitive Consequences of Emotion Regulation**

Suppression is a form of emotion regulation that requires self-monitoring and self-corrective action throughout an emotional event. Such monitoring requires a continual outlay of cognitive resources, reducing the resources available for processing events so that they can be remembered later. Reappraisal, by contrast, is evoked early on in the emotion-generative process. Therefore, this strategy typically does not require continual self-regulatory effort during an emotional event. This would make costly self-regulation unnecessary, leaving memory intact.

We tested these predictions in several interlocking studies (Richards & Gross, 2000). In one study, participants viewed slides under one of three conditions: reappraisal, suppression, or a "just watch" control. Slides depicted injured men, and information concerning each man was provided orally as each slide was presented.

Suppression led to worse performance on a memory test for information presented during slide viewing. Reappraisal did not.

To see whether our laboratory findings would generalize to everyday life, we examined memory and individual differences in emotion regulation, measured with the Emotion Regulation Questionnaire (Gross & John, 2001). Individuals with high scores on the Suppression scale of the questionnaire reported having worse memory than individuals with low Suppression scores. They also performed worse on an objective memory test in which participants were asked to recall events they had listed in a daily diary 1 week earlier. By contrast, Reappraisal scores had no relationship to either self-reported or objective memory. Together, these findings suggest that whereas suppression is cognitively costly, reappraisal is not.

### **Social Consequences of Emotion Regulation**

Emotions serve important social functions. Thus, emotion regulation should have social consequences, and different regulation strategies should have different consequences. As postulated in my model, reappraisal selectively alters the meaning of an emotion-eliciting situation. In emotionally negative situations, reappraisal decreases negative emotion-expressive behavior, but does not decrease positive behavior. Suppression, by contrast, decreases both negative and positive emotion-expressive behavior. This decrease in positive emotion-expressive behavior should interfere with social interaction, leading to negative reactions in other individuals.

To test this prediction, we asked unacquainted pairs of women to view an upsetting film, and then discuss their reactions (Butler, Egloff,

Wilhelm, Smith, & Gross, 2001). Unbeknownst to the other, one member of each dyad had been asked to either suppress her emotions, reappraise the meaning of the film, or interact naturally with her conversation partner. We expected suppression to decrease both negative and positive emotion-expressive behavior in the regulator. Positive emotion expressions are a key element of social support, and social support decreases physiological responses to stressors (Uchino, Cacioppo, & Kiecolt-Glaser, 1996). We therefore reasoned that the diminished positive emotion-expressive behavior shown by participants who suppressed their emotions would produce large physiological responses in their interaction partners. By contrast, we did not expect participants given the reappraisal instructions to show decreased positive emotion-expressive behavior. We therefore expected that their interaction partners would have physiological responses comparable to those of the partners of participants who acted naturally.

Figure 2 shows that partners of participants asked to suppress their emotions had greater increases in blood pressure than partners of participants given reappraisal instructions or asked to act naturally. Interacting with a partner who shows little positive emotion is more physiologically activating than interacting with a partner who shows greater positive emotion. This finding extends prior work by Fredrickson and Levenson (1998), who showed that positive emotions speed cardiovascular recovery from negative emotions. Emotion-regulation strategies that increase (or at least maintain) positive emotion should be calming for both the regulator and the interaction partner, whereas strategies that diminish positive emotion should increase physiological responses of both the regulator and the interaction partner.

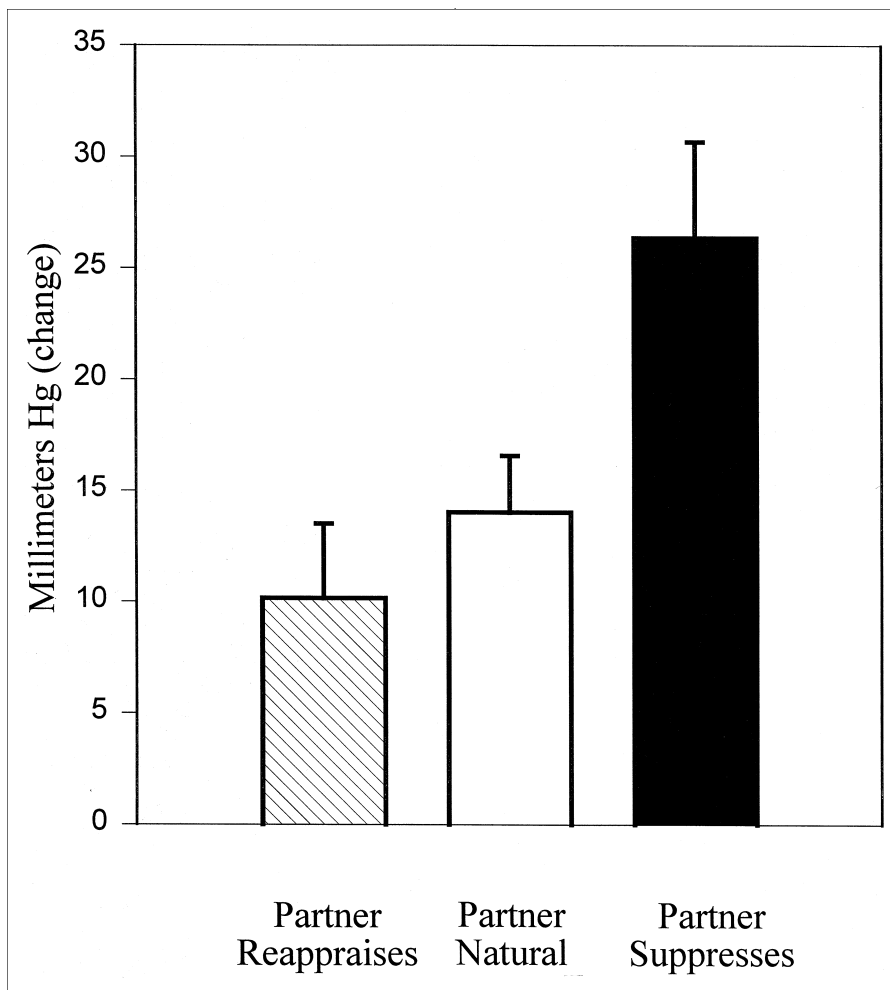


Fig. 2. Social consequences of emotion regulation. Mean change in blood pressure is shown separately for individuals whose conversation partners were asked to reappraise the situation, act naturally, or suppress their emotions (Butler, Egloff, Wilhelm, Smith, & Gross, 2001).

### DIRECTIONS FOR FUTURE RESEARCH

My model suggests that adjustments made early in the emotion trajectory are more effective than adjustments made later on. The findings I have reviewed support this prediction. Reappraisal decreases expressive behavior and emotion experience, and does not adversely affect physiological responding, memory, or the regulator's interaction partner. Suppression, by contrast, has no impact on emotion experience, impairs memory, and increases physiological re-

sponding in both the regulator and the partner.

One direction for future research is to learn more about emotion regulation at each step in the emotion-generative process. This review has focused on one type of cognitive change and one type of response modulation. Do other forms of cognitive change and response modulation have similar consequences? Moreover, what are the differences among the antecedent-focused strategies of situation selection, situation modification, cognitive change, and attentional deployment? Similarly, what are the differences among the response-focused strategies?

A second important direction for future research is to explore the long-term consequences of differing emotion-regulation strategies. I have largely focused here on the immediate effects of reappraisal and suppression. However, if there are consistent individual differences in emotion and emotion regulation, such differences might have cumulative effects. For example, each time emotion is suppressed, physiological responses are magnified. Any one physiological response of increased intensity is unlikely to have deleterious consequences. But if such responses recur day after day after day, there might be adverse health consequences. A recent study illustrates how such a hypothesis might be tested. Heart attack survivors were divided into four groups, depending on their distress and their tendency to suppress emotion (Denollet et al., 1996). The subgroup scoring high on both distress and suppression had a significantly higher death rate (27%) than other patients (7%). This finding suggests that suppression indeed has important cumulative health consequences.

A third direction for future research is to explore whether people regulate emotional impulses in the same way as physical impulses such as hunger, aggression, and sexual arousal. Do strategies that help people stay emotionally cool also help them avoid eating that extra piece of cake, or steer clear of that tempting adulterous relationship? Or must each type of impulse be handled differently? Answers to such questions are of rich theoretical interest, and will also have great practical value for education and therapy.

### Recommended Reading

- Gross, J.J. (1998a). (See References)  
 Gross, J.J. (1999a). (See References)  
 Richards, J.M., & Gross, J.J. (2000).  
 (See References)

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## Notes

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2. This review focuses on emotion regulation in adults. For a recent review of emotion regulation in childhood, see Eisenberg, Fabes, Guthrie, and Reiser (2000).

3. The term “reappraisal” has a long history. Although some researchers find it confusing because it suggests that there is an initial appraisal that is then reworked, I use it for historical continuity. My focus here is on reappraisal that is used to cognitively transform a potentially negative-emotion-inducing situation so as to reduce its emotional impact. The term “suppres-

sion” also has a long history. It has been used to refer to inhibiting feelings, behavior, or thoughts. Here I use it to refer to inhibiting emotion-expressive behavior.

4. One puzzle is why reappraisal did not decrease physiological responding in this study. The potency and brevity of the surgical film may have made it difficult for participants to curtail their physiological responses in the time specified.

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