The Extended Process Model of Emotion Regulation: Elaborations, Applications, and Future Directions

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Three observations motivated the target article (Gross, this issue). The first is that emotion regulation processes play a crucial role in health and illness, and thus warrant deeper understanding. The second is that a growing appreciation of the importance of emotion regulation processes has led to an extraordinary increase in research in this area. The third is that there is an urgent need for a process-oriented framework to integrate and guide this research, one that would extend the process model of emotion regulation, first proposed nearly two decades ago (Gross, 1998b).

I was therefore delighted that the dozen-plus distinguished scholars who provided commentaries on the target article not only endorsed these three motivating observations but also saw merit in the extended process model (EPM) as a framework for integrating existing research and for suggesting directions for future research. In light of this agreeable consensus, I use this response to (a) offer a precis of the EPM, (b) elaborate upon five core features of the EPM, (c) highlight some of the many applications of the EPM suggested by the commentators, and (d) discuss theoretical and empirical challenges and future directions.

Precis of the EPM

The EPM holds that emotions—like other types of affect—result from the operations of valuation systems. Drawing upon cybernetic/control systems theory, a valuation system may be represented by distinguishing among states of the world (“W”), perceptions of those states (“P”), negative or positive valuations of these perceptions in light of a relevant goal or target state (“V”), and actions taken to realize the goal or target state (“A”). Some of these actions are “mental” (e.g., attending to a stimulus); others are “physical” (e.g., reaching for an object).

As we go about our lives, many different valuation systems are typically active simultaneously. Each is sensitive to different aspects of any given situation, and each activates action impulses relevant to its own evaluation of that situation. The concurrent activation of multiple valuation systems frequently leads the valuation systems to interact with one another. Sometimes, valuation systems are mutually supportive, pulling in the same direction. At other times, valuation systems pull in different directions, and their divergent outputs compete with one another.

Emotion regulation refers to a particular type of interaction between valuation systems, one that occurs when one valuation system (which I refer to as a “second-level” valuation system) takes another valuation system (which I refer to as a “first-level” valuation system, i.e., one that is generating emotion) as its input, evaluates it either negatively or positively, and activates action impulses that are intended to modify the activity of the first-level valuation system. Emotion regulation thus may be defined by the activation of a goal to modify an unfolding emotional response (Gross, Sheppes, & Urry, 2011a).

According to the EPM, the second-level valuation system can modify the first-level valuation system in five ways. These include (a) taking steps to influence which situation one will be exposed to (situation selection), (b) changing one or more relevant aspects of the situation (situation modification), (c) influencing which portions of the situation are perceived (attentional deployment), (d) altering the way the situation is cognitively represented (cognitive change), and (e) directly modifying emotion-related actions (response modulation). These represent the five families of emotion regulation processes that were described by the original process model of emotion regulation (Gross, 1998b).

The EPM extends the original process model by distinguishing three stages of the emotion regulation cycle (for other related approaches, see Bonanno & Burton, 2013; Webb, Gallo, Miles, Gollwitzer, & Sheeran, 2012). These stages are (a) identification (concerned with whether to regulate emotion), (b) selection (concerned with what strategy to use to regulate emotion), and (c) implementation (concerned with implementing a particular tactic suited to the present situation). In addition, the EPM describes the nature of the processing dynamics that emerge as the second-level valuation system iterates over time.

Elaborations of Key Features of the EPM

Commentators drew attention to a number of features of the EPM. In so doing, they helpfully
identified places the EPM might be further elaborated. In the following sections, I briefly elaborate upon five key features of the EPM.

A Cybernetic/Control Systems Perspective

In their penetrating commentary, Webb, Totterdell, and Ibar (this issue) highlight several of the many sources of inspiration for the EPM. In particular, Webb and colleagues note the continuity between the EPM and cybernetic/control systems perspectives, which posit that self-regulation is made possible by negative feedback loops that decrease the discrepancy between a current state and a reference value. I completely agree with their assessment, and in the target article I pointed to a number of cybernetic/control system precursors to the EPM (Carver & Scheier, 1982, 2013; Magen & Gross, 2010; Miller, Galanter, & Pribram, 1960; Powers, Clark, & McFarland, 1960a, 1960b; Rangel, Camerer, & Montague, 2008; Wiener, 1948). I see this intellectual continuity as a core strength of the EPM, building as it does on the powerful notion that motivated behavior in many domains (including emotion regulation) relies upon successive approximations of desired target states.

The link between cybernetic/control systems perspectives and emotion regulation has not always been evident to me. In fact, I actually went so far as to say that “Carver and Scheier’s (1990) conception of emotion provides relatively inhospitable ground for the study of emotion regulation” (Gross, 1998b, p. 272). This judgment flowed from the fact that Carver and Scheier’s analysis features two interacting feedback loops, the first of which is concerned with achieving a (nonemotional) goal and the second of which is concerned with evaluating the rate of progress toward that goal. Faster than expected progress leads to positive emotion, whereas slower than expected progress leads to negative emotion. Emotion is thus a by-product of goal pursuit, and emotion regulation is nowhere considered.

From the vantage point of the EPM, however, cybernetic/control systems perspectives are fertile rather than inhospitable ground for work on emotion regulation. The EPM begins its analysis with a valuation system that is giving rise to emotion, and the EPM is indifferent as to what the source of the emotion is (e.g., better than expected or worse than expected progress toward some goal, a threat to one’s safety, an exciting opportunity, etc.). The EPM is centrally concerned with the interaction between this first-order valuation system and one or more second-order valuation systems that take this first-order valuation system as input, and then seek to modify the operation of the first-order valuation system. In this sense, from the vantage point of Carver and Scheier’s analysis, the EPM (a) adds an additional level of valuation, and (b) focuses attention on how emotions are regulated (by the higher level valuation system) rather than regulating (driving goal pursuit in the primary valuation system). There is thus a difference in emphasis and focus between the two approaches, but the basic valuation machinery postulated by the EPM—namely, interacting hierarchically organized control loops—is drawn directly from classic cybernetic/control systems perspectives.

The Notion of a Valuation “System”

At the heart of the EPM is the notion of a valuation “system.” Two points should be made about valuation systems. First, although valuation systems share common features (four conceptually separable elements, denoted by W, P, V, and A), they also differ from one another in important ways. Second, valuation systems can be functionally coupled in such a way that several interlocking valuation subsystems constitute a single “valuation system.”

In the target article, the second-level valuation system was described as consisting of three functionally coupled valuation subsystems (one focused on identification, one on selection, and another on implementation), each of which is in turn composed of common W-PVA elements. What I did not emphasize in the target article is that the first-level valuation system—which generates emotion—can also be conceived of as involving functionally coupled valuation subsystems. It is beyond the scope of this reply to fully develop the implications of this idea, but in broad strokes, this conception makes clear contact with appraisal theories (e.g., Lazarus, 1991). In each case, the first valuation subsystem “calls” the next subsystem in line when its action output is a goal representation that activates that valuation system, which in turn may activate the next subsystem in line, and so on.

The EPM emphasizes commonalities across valuation systems. However, as Parkinson (this issue) notes in his excellent commentary, there are also important differences among valuation systems. In particular, different valuation systems “care” about different types of inputs, lead to different kinds of outputs, and operate on different time scales. Ochsner and Gross (2014) suggested that three overlapping classes of valuation systems may be distinguished. Core valuation systems respond to a specific set of highly delineated inputs (e.g., a sudden drop in blood pressure; the smell of attractive food). These are highly conserved systems the valuations of which show modest malleability due to learning and the action outputs of which are relatively stereotyped, context independent, and inflexible (e.g., fainting when a sudden blood pressure drop is detected; salivating when attractive food is detected). Contextual valuation systems
systems, by contrast, take contextual information (e.g., situational factors) into account when valuing inputs and potential responses. A wider range of inputs is relevant to these systems, which can take as inputs core valuation systems. Contextual valuation systems also have a greater degree of context sensitivity, flexibility, and openness to learning than the core valuation systems, as well as a wider range of action outputs. Conceptual valuation systems are even more flexible than the other two classes of systems. Conceptual valuation systems take both propositional and nonpropositional input; this can include other conceptual, core, and contextual valuation systems. The valuations of these inputs are highly influenced by prior experience and contextual variables. As might be expected, responses are highly flexible and situationally determined.

Temporal Dynamics

The EPM highlights the temporally extended nature of emotion regulation. In particular, it specifies how an initial perception of an emotion can activate processes that identify whether regulation is required. If regulation is required, other processes are launched to select a regulation strategy. Then, still other processes are activated to implement a particular emotion regulation tactic. If this tactic appears to be successfully changing relevant features of the first-level valuation system, the tactic will continue to be used (emotion regulation maintenance) until the goal is no longer active, either because the goal has been achieved or because another goal has displaced it. If the tactic is not successful, a new strategy/tactic may be selected (emotion regulation switching), or the entire emotion regulation process may be abandoned (emotion regulation stopping).

In their valuable commentary, Kuppens and Verdruyn (this issue) bring to bear an emotion dynamics perspective, which considers how emotions change over time (Kuppens, Stoten, & Mesquita, 2009). As they made clear, emotion dynamics can be studied by examining either global trajectories (the ebb and flow of emotion across situations) or emotional episodes (patterns of response within a given situation). One important insight that this perspective offers is that it may be possible to make robust inferences regarding underlying emotion regulation processes based on observed emotion dynamics in both global trajectories (by examining variability, covariation, inertia, and cross-lags) and in emotional episodes (by examining both the duration and the shape of the emotional response).

Kross (this issue) makes a number of important observations about emotion regulation and, among other things, asks how the distinction drawn between “antecedent-focused” emotion regulation and “response-focused” emotion regulation (Gross, 1998a) maps onto the EPM. This is an excellent question. Although this was not emphasized in the target article, I believe this distinction applies to the EPM in the sense that within any given cycle of the first-order valuation system that is generating emotion, a person may seek to alter relatively early steps in the valuation cycle (antecedent-focused regulation) or may seek to alter relatively later steps in the valuation cycle (response-focused regulation). This difference in which step in the valuation cycle is being targeted for regulation has very real consequences (Gross, this issue), and it is my hope that the more differentiated framework provided by the EPM will allow researchers to move beyond the relatively coarse distinction between antecedent- and response-focused regulation.

Context Sensitivity

According to the EPM, emotion regulation is defined by interactions among valuation systems over time. These interacting valuation systems are highly sensitive to the evolving context within which they are operating. More specifically, the EPM conceives of emotion regulation in terms of interactions that people have with each other and with other aspects of a dynamically unfolding environment. In this sense, the EPM offers a situated cognition perspective on emotion regulation: What is emphasized is the way that actions taken in particular contexts serve contextually defined goals. One implication is that context matters and that it is simply not possible to specify in a context-independent way whether a particular emotion regulation strategy is helpful or harmful.

Given the EPM’s emphasis on rapidly evolving responses to dynamic situations, I was delighted that Koole and Veenstra (this issue) speak in strong support of a situated cognition perspective, one that highlights the important role played by local affordances in the generation of both emotion and emotion regulation. I was mystified, however, to see that Koole and Veenstra not only fail to appreciate that the EPM takes such a perspective but instead mischaracterize the EPM as being concerned with static representations located solely inside people’s heads. I’m not sure what else I could have done in the target article to highlight the importance of the context within which regulation takes place (the W in each of the figures), as well as the dynamic nature of emotion regulation (highlighted via the spiral figures throughout the target article), but I’m glad for this opportunity to reaffirm the crucial role played in the EPM by contextual factors (such as other people).

Other commentators more fully appreciated the EPM’s emphasis on contextual factors. For example, one of the main themes in the incisive commentary
by Aldao and Christensen (this issue) is the role of context in emotion regulation. One of the key points in this commentary is that the adaptiveness of any motivated behavior—including emotion regulation—is dependent on context (Aldao, 2013). Similarly, in Schmader and Mendes’s (this issue) helpful commentary, they note with approval the EPM’s strong emphasis on how people are embedded in social context.

Intrinsic Versus Extrinsic Regulation

The EPM distinguishes two broad types of emotion regulation: intrinsic (which targets one or more aspects of emotion in the person who is doing the regulating) and extrinsic (which targets one or more aspects of emotion in someone other than the person who is doing the regulating). Whether people are engaged in intrinsic emotion regulation, extrinsic emotion regulation, or both, they seek to alter the intensity, duration, and/or quality of the emotion. Often, people down-regulate negative emotions and up-regulate positive emotions (Gross, Richards, & John, 2006). On occasion, however, people try to up-regulate negative emotions and down-regulate positive emotions (Tamir, 2009). As with other goal-directed behavior, emotion regulation goals may be either explicit or implicit (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Troetschel, 2001).

One intriguing aspect of Webb et al.’s (this issue) commentary is their emphasis on the potential for complexity in extrinsic emotion regulation. In particular, they highlight the fact that extrinsic emotion regulation involves interactions among valuation systems in each of two (or more) people, and they suggest the value of computer simulations in understanding these complex within- and between-person dynamics. In Parkinson’s (this issue) excellent commentary, he also stresses the complexity of extrinsic regulation, and directs attention to the fact that emotions themselves are valuation systems and therefore are associated with actions that can influence others’ emotional responses.

I completely concur with these thoughtful observations. Indeed, my concerns along these lines are in part responsible for my evolving thoughts on whether extrinsic emotion regulation really should be considered a form of emotion regulation. In early work, I took the position I now do, namely, that intrinsic and extrinsic emotion regulation are both part of the larger category of emotion regulation (Gross & Levenson, 1993). Worrying about the heterogeneity of motives, goals, and processes engaged in these two cases, I subsequently argued that emotion regulation should be restricted to intrinsic regulation only (Gross, 1998b). Since then, I’ve become convinced that the overlap in core mechanisms justifies my original (and current) position, namely that emotion regulation should be viewed as including both intrinsic and extrinsic forms (Gross & Thompson, 2007; Gross, 2013b). However, more work needs to be done—both theoretically and empirically—to figure out how to best apply the EPM to extrinsic emotion regulation, and to determine similarities and differences between intrinsic and extrinsic regulation.

Applications of the Extended Process Model

In the target article, I noted that emotion regulation is an active topic of investigation in all major subareas within psychology (biological, cognitive, developmental, social, industrial-organizational, personality, clinical, health), as well as in other related fields (including anthropology, business, economics, education, law, medicine, political science, and sociology). One compelling feature of a number of the commentaries was that they explored applications of the EPM in diverse areas within psychology. In the following sections, I highlight some of these applications.

Cognitive Applications

In the cognitive domain, Saunders, Milyavskaya, and Inzlicht (this issue) argue that the implementation of cognitive control can be seen as a type of emotion regulation. This is because goal conflict produces negative affect, and cognitive control can be viewed as a means of reducing this negative affect. This view is predicated on the assumption that people seek “cognitive comfort” defined as “a subjectively pleasant state free of the aversive experience of goal conflict” (p. 109). This commentary suggests the interesting possibility that successful emotion regulation may be associated with lesser engagement of cognitive control (because the negative affect that would usually prompt cognitive control has been reduced or eliminated). More broadly, this analysis presents a thought-provoking challenge to conventional distinctions between “cognitive” and “affective” domains.

Developmental Applications

Diaz and Eisenberg (this issue) focus part of their interesting commentary on developmental applications of the EPM. These authors agree that age is a key moderator of emotion regulation and consider antecedents and consequences of regulation across the lifespan. In particular, Diaz and Eisenberg emphasize that one source of individual differences in emotion regulation is parenting, which they argue affects all three stages of the EPM (identification, selection,
been seen as its own separate literature—is actually a mechanism for the performance decrements observed in stereotype threat may be the use of relatively maladaptive forms of emotion regulation such as emotional suppression. This leads to the important question of how such feelings of threat might be successfully managed. The third case study concerns the emotion of shame, which often is a target of down-regulation. However, the authors argue that shame may have adaptive qualities and note that a more widespread recognition of these adaptive qualities might have the salutary effect of decreasing maladaptive emotion regulation efforts.

Social Applications

Schmader and Mendes’s (this issue) interesting commentary uses a case-study approach to apply the EPM to social psychology. The first case study considers how interactions with outgroup members can lead to subjective feelings of anxiety as well as physiological threat responses that motivate emotion regulation attempts from both majority and minority group members. Unfortunately, these regulatory efforts can actually backfire, and this observation highlights the need for more research on how to successfully manage the anxiety occasioned by cross-group interactions. The second case study examines stereotype threat, which occurs when people fear confirming a negative group-based stereotype. As Schmader and Mendes point out, one important mechanism for the performance decrements observed in stereotype threat may be the use of relatively maladaptive forms of emotion regulation such as emotional suppression. This leads to the important question of how such feelings of threat might be successfully managed. The third case study concerns the emotion of shame, which often is a target of down-regulation. However, the authors argue that shame may have adaptive qualities and note that a more widespread recognition of these adaptive qualities might have the salutary effect of decreasing maladaptive emotion regulation efforts.

Industrial/Organizational Applications

Grandey (this issue) provides a compelling argument that emotional labor—which for decades has been seen as its own separate literature—is actually best conceptualized as “emotion regulation in the workplace” (p. 54). When a cashier or airline stewardess is told to smile at customers and to avoid negative emotion displays however unreasonable the customer’s requests, these instructions seem to be a clear call for emotion regulation. Grandey acknowledges that there are differences in focal constructs, methods, and outcomes in the emotional labor and emotion regulation literatures. Like Grandey, however, I believe that the benefits of the conceptual move she is advocating are overwhelming, and seem likely to flow in both directions (Gross, 2013a). This is because researchers interested in emotional labor stand to benefit from developments in the larger emotion regulation literature. At the same time, researchers interested in general emotional regulation processes can see how their models (and interventions) apply to the real-world context of the workplace with its very real impact on health and well-being.

Clinical Applications

The target article describes how the EPM can be used to analyze both normal- and pathological-range variation in emotion regulation. A more complete treatment of how the EPM might be used to analyze links between emotion regulation and psychopathology may be found in Sheppes, Suri, and Gross (in press). Clinical applications were also nicely elaborated in several of the commentaries.

Mennin and Fresco (this issue) consider clinical applications of the EPM, with a particular focus on distress disorders. These are psychiatric disorders that involve extended processing of negative affect. They include generalized anxiety disorder, major depressive disorder, and posttraumatic stress disorder. Mennin and Fresco argue that the EPM provides insights into these disorders by drawing attention to the role of motivation (i.e., the interactions between reward and security valuation systems), self-referential processing (i.e., negative self-referential processing), and contextual learning (i.e., how various types of learning help “tune” relevant valuation systems). They also made the important broader point that an emotion regulation perspective may be particularly well suited to a research domain criteria perspective (Insel et al., 2010) that showcases common risk factors and mechanisms that cut across traditional distinctions among mental disorders.

In their insightful commentary, Giuliani and Berkman (this issue) argue that craving is an affective state and that the EPM is a useful framework for examining the self-regulation of craving (e.g., for drugs or food). One way this framework is useful is that it highlights mechanisms that are associated with regulating craving. These include situation selection (e.g., decreasing exposure to cues that will provoke
craving), situation modification (e.g., moving away from a desirable food), attentional deployment (e.g., directing attention away from food), cognitive change (e.g., thinking about benefits of eating a healthy meal), and response modulation (e.g., inhibiting the urge to eat something unhealthy). A second way this framework is useful is that it suggests novel interventions to increase self-regulation of craving at each of the stages in the EPM (identification, selection, implementation).

Challenges and Future Directions

In the target article, I outlined five promising directions for future research on emotion regulation. Here, I consider some of the broader theoretical and empirical challenges (and opportunities) identified by the commentators.

Theoretical Challenges

One theoretical challenge is one of the most basic, namely, defining how emotion regulation is related to other constructs (e.g., emotion, self-regulation), as well as how different emotion regulation strategies (e.g., cognitive change, response modulation) are related. This challenge is noted in several commentaries.

One commentary advocates dramatically trimming the definition of emotion regulation so that it refers only to “the set of processes that determines the offset of an activated emotional response” (Koole & Veenstra, this issue, p. 62). However, one disadvantage of this truncated conception of emotion regulation is that it fails to address efforts to modify emotion onset, emotion quality (i.e. which emotion is activated), or emotion magnitude. These constitute much of what people do in everyday life to regulate emotions (Gross et al., 2006).

A second commentary argues for both splitting and lumping (Kross, this issue). One motivation for splitting is that emotion regulation strategies do not seem homogeneous. For example, Kross (this issue) indicates that cognitive change may not be a “pure form” because “people can change the way they think to change the way they feel in potentially infinite ways” and because it seems likely that “certain reappraisals are more helpful in certain situations compared to others” (p. 69). I agree, and this is why in the EPM I’ve emphasized the distinction between broad emotion regulation strategies (such as cognitive change) and the specific tactics that are used in a particular situation. Elsewhere, Kross argues in favor of lumping, saying that it may be time “to begin integrating across closely related areas of inquiry to identify common threads,” and gives as an example an analysis of what cognitive change and attentional deployment might have in common (p. 70). I agree, and would take this argument one step further, suggesting that the EPM is a framework that will help researchers expose mechanistic similarities and differences not only among different emotion regulation strategies but also among other types of self- and other-regulation processes.

A third commentary drew attention both to cases where the EPM seemed to exclude from consideration things it should include, and cases where the EPM seemed to include things it might better exclude. Parkinson (this issue) gives as an example of the former case classic work by Lazarus and colleagues in which participants were instructed to view a movie as staged rather than real (Lazarus, Opton, Nomikos, & Rankin, 1965), arguing that these participants were not engaging in emotion regulation as I’ve defined it because no goal to regulate the emotion was activated. I am sympathetic to Parkinson’s concerns about boundary drawing but believe that a goal can be activated “from the outside” (by the experimenter, in this case) and that this goal may be operative even when the person who has been led to activate an emotion regulation goal may not be aware that this has happened. This is why I have previously cited this and related work as examples of reappraisal (Gross, 1998b). Parkinson (this issue) also worries about cases such as expressive suppression (in which emotion-expressive behavior is inhibited), saying that he sees the processes associated with suppression as very different from those associated with other forms of emotion regulation, such as reappraisal. Here I agree with Parkinson that there seem to be important differences in the antecedents, mechanisms, and outcomes associated with suppression and reappraisal (Gross, 2013b). However, as I’ve argued in the target article, I see both as instances of the broader class of emotion regulation, united by the goal to modify the emotion trajectory.

These definitional debates—which mirror those that have played out in the field—highlight the need to clarify the psychological and neurobiological mechanisms that underlie emotion, emotion regulation, and other forms of affect and affect regulation. This is a major goal of the EPM. From this perspective, whether one lumps or splits depends upon one’s particular research goals, and I’ve argued that the field would benefit from moving beyond debates about what distinctions should be made to demonstrations of what is gained (in terms of new understanding of the underlying processes) with one or another approach (Gross, Sheppes, & Urry, 2011b).

Empirical Challenges

However defined, one of the key empirical challenges is providing a more detailed account of the
mechanisms that enable different forms of emotion regulation in different contexts. This is important because, as Parkinson (this issue) correctly notes, the EPM currently doesn’t provide implementation-level details.

One domain in which there has been particularly exciting progress is the domain of regulating responses to food cues. In one seminal study in this domain, self-reported dieters were recruited for a functional magnetic resonance imaging study in which they made decisions about which foods they wished to eat (Hare, Camerer, & Rangel, 2009). Some participants were classified as self-controllers—they made decisions based both on the health value of the food item and its taste. Other participants were classified as non-self-controllers—they made decisions based on taste alone. Findings suggested that (a) activity in the ventromedial prefrontal cortex (vmPFC) was associated with the value participants placed on food cues; (b) vmPFC responses were modulated by both health and taste for self-controllers, and only by taste for non-self-controllers; (c) successful self-control (i.e., choosing the healthier option) was associated with relatively greater recruitment of left dorsolateral prefrontal cortex (dLPFC); and (d) self-controllers showed greater recruitment of dLPFC than non-self-controllers.

Subsequent studies have begun to more directly examine the mechanisms that underlie self-regulation by manipulating these processes. For example, in one study, participants were asked to either up- or down-regulate their food cravings while making decisions about what to eat (Hutcherson, Plassman, Gross, & Rangel, 2012). Findings indicated that down-regulation of craving led to decreased responses in the value-sensitive region of the dLPFC but not in the vmPFC (selective value modulation) and that the relative contribution of dLPFC signal to behavior increased (behavior control modulation). By contrast, up-regulation of craving led to increased responses in the vmPFC but not dLPFC, and the relative contribution of the vmPFC signal to behavior increased. These and related findings are beginning to clarify how valuation systems interact with one another to produce behavior.

How might these developments be leveraged to sharpen our understanding of the mechanisms that support emotion regulation? Efforts to describe the brain systems that support emotion regulation are best developed for cognitive change. These efforts suggest that reappraisal engages dorsomedial, dorsolateral, and ventrolateral prefrontal cortex, as well as temporal and parietal cortex. Depending on the context, this network either up- or down-regulates the activity of emotion-generative systems including the amygdala and ventral striatum. Yet these brain regions are each highly differentiated, and one crucial challenge is to identify with greater specificity which neural populations are engaged at each point in the emotion regulation process for any given emotion regulation strategy or tactic. As noted in the target article, one promising approach is manipulating (enhancing or degrading) these brain systems A second approach is examining emotion regulation successes and failures in individuals with emotion-relevant disorders.

Concluding Comment

It is now widely appreciated that emotion regulation plays a crucial role in healthy adaptation and that difficulties with emotion regulation are associated with psychological and physical health problems. This realization has led to a surge of interest in emotion regulation processes. My goal in the target article was to extend the original process model of emotion regulation, which I introduced nearly two decades ago now, when the field of emotion regulation was just emerging.

I am very grateful to the dozen-plus scholars who took the time to carefully read the target article and provide such thoughtful commentaries. In this reply, I have endeavored to elaborate upon core features of the EPM, to draw out some of the applications of the EPM suggested by the commentators, and to point to crucial theoretical and empirical challenges that lie ahead. Whatever disagreements may exist, I remain unremittingly optimistic about the immediate and longer-term benefits of a deeper understanding of emotion and emotion regulation.

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Note

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References


