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## **EMOTION REGULATION: A THEME IN SEARCH OF DEFINITION**

*Ross A. Thompson*

Interest in emotion regulation has burgeoned in recent years because it builds on several recent trends in the study of emotional development (Thompson, 1993). First, after more than a decade of research emphasizing the growth of discrete emotions and their consequences for sociopersonality functioning, researchers have realized that the specific emotion indexes only part of the rich individual variability that exists in emotional behavior. In addition, individuals display variations in the intensity, persistence, modulation, onset and rise time, range, and lability of and recovery from emotional responses. These “emotion dynamics” (Thompson, 1990) constitute significant response parameters that are influenced by emotion regulation processes. In a sense, while the discrete emotion may “play the tune” of a person’s emotional response, these emotion regulation processes significantly influence its quality, intensity, timing, and dynamic features and thus significantly color emotion experience.

Second, emergent views of emotion underscore its biologically adaptive and psychologically constructive features in contrast with earlier portrayals of emotion, which emphasized its disorganizing, irrational, or stressful side (e.g., Barrett & Campos, 1987; Malatesta, 1990). Emotional arousal has, of course, the capacity to either enhance or undermine effective functioning, and emotion regulation processes are important as they enlist emotion to support adaptive, organized behavioral strategies. Emotion regulation is relevant, for example, to effective social strategies with peers (e.g., Rubin & Rose-Krasnor, 1986), successful cognitive performance in tasks involving

I am grateful to Alice Ganzel, Megan Gunnar, and Kathy Stansbury for helpful, critical readings of an earlier draft of this essay and to Pamela Cole for stimulating exchanges about these issues.

delay, inhibition, or the pursuit of long-term goals (e.g., Mischel & Mischel, 1983), and the management of stressful experiences at home (Cummings, Pellegrini, Notarius, & Cummings, 1989). In a sense, students of emotional development have moved beyond the realization that discrete emotions are biologically adaptive to the awareness that emotional responses must also be flexible (rather than stereotypical), situationally responsive (rather than rigid), and performance enhancing (rather than over- or underarousing) and must change quickly and effectively in order to adapt to changing conditions if they are to support organized, constructive functioning in higher organisms. This is where emotion regulation processes often enter in.

Third, newer portrayals of emotional development also emphasize the socialization of emotion as a significant constituent of emotional development. Through processes ranging from selective reinforcement and modeling of expressions of emotion to emotion-focused discourse, the social context not only fosters greater “emotional competence” (Saarni, 1990) in developing individuals but also channels emotional behavior in directions that meet the expectations of the “emotion culture” (Gordon, 1989) in which those individuals develop. As a consequence, emotion experience derives from an interaction between biologically based emotive processes and the socialized monitoring, evaluative, and regulatory processes by which emotion experience is interpreted and managed in culture-specific ways. Moreover, as developing individuals become more skilled at regulating arousal, emotion and its expression can become better integrated into the child’s growing repertoire of strategic behavior in social contexts. Emotion regulation is central both to the socialization process and to its developmental outcomes.

Finally, emotions theory is currently also concerned with individual differences in personality and social functioning and the central role that emotive processes play in these differences. Whether the focus is on individual differences in infant-mother attachment and the emotional biases that they reflect (Malatesta, 1990; Thompson, 1991; see also Cassidy, in this volume), variations in behavioral inhibition and their origins in the self-regulation of emotion (see Fox, in this volume; Kagan, in this volume), or the interpretive processes underlying the emotional reactions of aggressive children to their peers (Dodge, 1991a), researchers are exploring aspects of emotion regulation and dysregulation that guide social and personality processes. The common theme underlying these studies is how emotional arousal comes to *mean* different things to different individuals (e.g., why anger is empowering to some people, disorganizing for others, and to be denied or avoided for others), and emotion regulation is a significant component of these individual differences.

These current trends in theory and research on emotional development have provided an auspicious beginning to the study of emotion regulation. But, as so often happens with auspicious beginnings, recent enthusiasm for the study of emotion regulation has outpaced attention to some basic definitional and conceptual issues. This is because many researchers share a common intuitive understanding of what is meant by *emotion regulation* or of the distinguishing features of the “optimal” self-management of emotion, but these implicit formulations have tended to obscure the heterogeneity of emotion regulation processes, the complexity of their development, their links to significant social relationships and to the “emotion culture” that we share, and the challenges of identifying the origins and correlates of these regulatory processes. My purpose in this essay is to highlight these complexities by (re)considering the following questions: How should we define *emotion regulation*? What is regulated in the regulation of emotion? How do emotion regulation strategies fit into the complex fabric of social interaction? What are the predictable correlates of individual differences in emotion regulation? In a sense, my goal is to “unpack” the concept of emotion regulation to better elucidate its component processes.

### DEFINING EMOTION REGULATION

The power of our shared, implicit notions of what constitutes emotion regulation is reflected, perhaps, in how frequently papers on emotion regulation (including my own) lack a clear definition of this phenomenon. Yet behind this apparent consensual understanding is considerable diversity in the underlying portrayals of emotion regulation provided by different researchers and theorists. Does emotion regulation pertain exclusively to the inhibition of emotional reactions, for example, or does it also include the maintenance or enhancement of emotional behavior? Is emotion regulation primarily an issue of emotion *self*-management, or is the management of emotional reactions by others also included? Does emotion regulation primarily influence the discrete emotion that one experiences, or rather its quality (e.g., its intensity, speed of onset, or persistence)? Is emotion regulation primarily concerned with the management of expressions of emotion or the underlying arousal processes leading to those expressions—or both?

There is surprising diversity in the ways that different researchers answer these questions in their implicit formulations of emotion regulation. My own answers are indicated in the following definition:

Emotion regulation consists of the extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reac-

tions, especially their intensive and temporal features, to accomplish one's goals.

Included in this definition are several characterizations of emotion regulation processes.

First, consistent with Masters (1991), emotion regulation can involve maintaining and enhancing emotional arousal as well as inhibiting or subduing it. It is natural that theorists emphasize emotion inhibition in a culture that, like ours, values this characteristic: in everyday circumstances, emotion regulation skills are most often enlisted to dampen emotional arousal (especially negative emotion). But, even in our culture, strategies of emotion management are often used to maintain or enhance emotional arousal, such as when children intensify their anger to stand up to a bully who is also feared (see Miller & Sperry, 1987), or when they "feel sorry for themselves" when unjustly treated, or when adults ruminate on feelings of guilt, anger, or shame in response to social injustice. And children and adults frequently enlist strategies to heighten positive arousal (e.g., by reenacting pleasant or humorous experiences), sometimes to manage negative affect. In these and other instances, the enhancement of emotional arousal (not just its display) serves important strategic purposes, and this becomes the goal of the emotion regulation process.

Second, emotion regulation encompasses not only acquired strategies of emotion *self*-management but also the variety of external influences by means of which emotion is regulated. This is because a considerable amount of emotion regulation occurs through the interventions of others. In infancy, for example, caregivers devote considerable effort to monitoring, interpreting, and modulating the arousal states of young offspring—in other words, regulating their emotions. As offspring mature, parents use direct interventions as well as indirect strategies (e.g., coaching response alternatives) not only to maintain emotional well-being in their children but also to socialize emotional behavior so that it accords with cultural expectations concerning feelings and their expression (Saarni, 1990). Moreover, parent-offspring relationships and other significant social ties affect the demands for emotion regulation and the efficacy of strategies for managing arousal that children acquire in the context of these close relationships. And, as adults, we frequently manage the emotions of others by extending a sympathetic ear or using humor in a frustrating situation. Taken together, therefore, the development of the skills required to manage one's own emotion occurs in a social context (both proximate and cultural) that significantly shapes children's management of arousal through external regulatory influences.

Third, although emotion regulation sometimes affects the discrete

emotion experienced by an individual (e.g., the arousal of guilt or shame rather than anger when unfairly accused), more commonly it affects the intensive and temporal features of that emotion. In other words, aspects of emotion management subdue (or enhance) the intensity of experienced emotion, retard (or speed) its onset or recovery, limit (or enhance) its persistence over time, reduce (or increase) emotion range or lability, and affect other qualitative features of emotional responding. Because of this, new strategies for the study of emotion regulation are required that are sensitive to these intensive and temporal features of emotional responding, even when the discrete emotion itself is unaffected. Several new methodological approaches meant to accomplish this are outlined at the conclusion of this essay.

Finally, emotion regulation must be regarded functionally, that is, in terms of the regulator's goals for a particular situation. These goals may be diverse and changing, and, as I argue later, they include far more than simply maintaining a positive disposition in oneself or another. Indeed, an understanding of individual differences as well as developmental changes in emotion regulation may hinge on an appreciation of the goals for managing emotion that are motivating regulatory efforts, and this makes goal attainment a central definitional feature of emotion regulation. To be sure, historically there have been important problems with functionalist approaches like this one to psychological processes (circular reasoning among them: theorists can easily infer goals that are consistent with their behavioral analysis), but these problems should instill caution rather than avoidance of such an approach to the study of emotion regulation. Indeed, contemporary interest in emotion regulation is consistent with emergent functionalist approaches to emotional development that are currently enlivening emotions research (e.g., Barrett & Campos, 1987).

This is an inclusive definition of *emotion regulation*, and among the many issues not addressed here are distinguishing (if necessary) emotion regulation from related processes like defense mechanisms and display rules, articulating the relations between the self-regulation of emotion and the development of other self-regulatory capacities, and clarifying the inferential, interpretive, and social-cognitive constituents of the self-regulation of emotion. Necessary also are process models that distinguish operationally such other elements of emotion regulation as situation appraisal, goal selection, strategy choice, and outcome monitoring (cf. Garber, Braafladt, & Zeman, 1991). These are formidable challenges, but recognizing them as such steers us away from prematurely assuming that either clear or consensual definitions of *emotion regulation* currently exist. Most developmental researchers (myself included) may "know" emotion regulation when they see it, but considerably more is required if we are to develop a clear and comprehensive definition of this phenomenon.

## WHAT IS REGULATED?

Perhaps the most central definitional quandary for the study of emotion regulation concerns the issue of *what* is regulated when we consider the management of emotion.<sup>1</sup> Because emotion is a multifaceted phenomenon (involving physiological arousal, neurological activation, cognitive appraisal, attention processes, and response tendencies), there are diverse avenues toward the management of emotion, and consideration of these avenues reveals that the term *emotion regulation* does not refer to a unitary phenomenon but is rather a broad conceptual rubric encompassing a range of loosely related processes.

### *Neurophysiological Constituents*

At the core of these processes are the systems of nervous system organization that have evolved to regulate arousal (including emotional arousal) through the interplay of excitatory and inhibitory mechanisms. Many of these systems are functionally immature at birth, and their progressive maturation and consolidation not only foster greater behavioral and emotional self-control in the early years of life but also permit greater susceptibility to extrinsic regulatory influences and allow for the enlistment of emotion in aid of strategic behavioral processes. Moreover, individual differences in the reactivity of some of these systems reflect both biologically and experientially based processes that can influence personality and social functioning. Thus, one answer to the question, What is regulated? concerns the control of underlying arousal processes through maturing systems of neurophysiological regulation.

Any explication of these maturing neurophysiological systems must be both complex and incomplete, partly because the subcortical and cortical systems affecting emotional arousal are mutually interconnected and are intimately linked with other neurophysiological systems, including those governing cognition and vegetative regulation, in ways that researchers are just beginning to understand (see, e.g., Fox & Fitzgerald, 1990). Current advances in research in the neurosciences, and in developmental neurophysiology especially, will, one hopes, contribute to a clearer future picture of these regulatory processes. However, early developmental changes in emotion regulation can be linked to at least two neurophysiological advances in the first year of life that provide a foundation for more complex regulatory processes with growing maturity.

<sup>1</sup> I am grateful to Stephen Porges for having raised this provocative question during the working meeting on emotion regulation on which this *Monograph* is based.

First, the diffuse excitatory processes underlying organismic arousal decline in lability throughout the first year. This is partly due to postnatal changes in the functioning of the hypothalamic-pituitary-adrenocortical system that governs reactions to stress and uncertainty (as discussed in Gunnar, 1986, and Stansbury and Gunnar, in this volume) and maturational changes in parasympathetic regulation as indexed by vagal tone (Izard et al., 1991; Porges, 1991; Porges, Doussard-Roosevelt, and Maiti, in this volume). As a consequence, organismic arousal gradually becomes more graded as well as emotionally and motivationally more complex with increasing age. The declining lability of organismic arousal during the early postnatal months also aids caregivers' efforts to manage the emotion of offspring as well as enhancing the effects of other emergent, internal controls on emotion.

Second, cortical inhibitory controls over arousal emerge gradually during infancy, although some do not become fully functional until long after birth. By about 2–4 months, for example, the growth of rudimentary fore-brain inhibitory centers, changes in the organization of attention processes, and other neurophysiological advances are manifested in behavioral state changes (e.g., the emergence of more sustained attention and more regular sleep-wake patterns, greater regularity and control of behavioral state, the progressive disappearance of neonatal reflexes) as well as emotional changes (e.g., an increase in exogenous smiling and a capacity for laughter) and growing awareness of and emotional responsiveness to contingent stimulation (Emde, Gaensbauer, & Harmon, 1976; Rothbart, Ziaie, & O'Boyle, 1992; Watson & Ramey, 1972). According to Dawson (in this volume) and others (e.g., Fox, 1991, in this volume), by about 9–10 months maturation of the frontal lobe and its links to response inhibition (cf. Diamond, 1988) fosters the capacity for arousal management and efforts to cope with emotionally arousing events (see also Tucker & Frederick, 1989). These changes may also underlie the growing vitality and complexity of emotional behavior, such as the enhanced speed and intensity of emotional reactions (Thompson, 1990), the use of emotional behaviors to share and affect the attention and affective states of others (e.g., Scaife & Bruner, 1975; Stern, 1985), and the growth of emotional blends and other complex affective states.

Other cortical processes are also implicated in the growth of emotion regulation capacities, and the end of the first year is not the terminus of the neurophysiological changes that influence emotion regulation capacities (cf. Kinsbourne & Bemporad, 1984). There remains, therefore, a considerable research agenda ahead of us if we are to elucidate the neurophysiological substrates of emotion management capacities during the early years of life.

Individual differences in nervous system reactivity related to these arousal regulatory processes have also generated considerable recent interest. Consistent with the views of some temperament formulations that portray individual differences in temperament in terms of variations in emo-



tionality and self-regulation (e.g., Rothbart & Derryberry, 1981), findings from several researchers suggest that differences in various neurophysiological systems mediating emotion emerge early and are related to broader features of social and personality functioning. In his longitudinal study of behaviorally inhibited and uninhibited young children, for example, Kagan and his colleagues have argued that inhibited children have a generally lower threshold of reactivity in limbic structures mediating fear and defense and that these differences can be found in both physiological and behavioral measures through early childhood (see, e.g., Kagan, Reznick, & Snidman, 1988; Kagan & Snidman, 1991b; and, more generally, Kagan, in this volume). Fox and Calkins have compared groups of infants who differed on similar indices of behavioral inhibition early in infancy and found predictable later differences on measures of emotion regulation and attachment (see Calkins & Fox, 1992; Fox & Calkins, 1993; and, more generally, Calkins, in this volume; Fox, in this volume).

Taken together, these findings suggest that early emerging individual differences in physiological reactivity and regulation are related to variations in emotionality and emotion regulation. These differences are not immutable, however; both Kagan and Fox point out that they can be modified by caregivers' socialization efforts as well as other experiences that alter organismic reactions to stress and challenge (cf. Dienstbier, 1989). Consequently, not only confirming the neurophysiological bases for these individual differences in emotional reactivity and emotion management but also denoting sources of continuity and change in functioning remains a significant future research task.

In sum, capacities for emotion regulation and self-management are based, in part, on neurophysiological constituents that unfold during the first year and provide the basis for more complex forms of emotion management in later years. What is regulated is, in part, the neurophysiological processes underlying emotional arousal and its management.

### *Attention Processes*

Another way that emotion can be regulated is by managing the intake of emotionally arousing information. Attention processes assume an emotionally regulating function from very early in life. According to Rothbart (Rothbart, Posner, & Boylan, 1990; Rothbart et al., 1992), maturational changes in the neurophysiological organization of visual control between 3 and 6 months of age permit the infant to shift attention between stimulus events voluntarily, in contrast with the "obligatory attention" observed at younger ages. Not only does this enable the infant to disengage visually from emotionally arousing events (which becomes more commonly ob-

served at this time, e.g., during episodes of mother-infant play; Gianino & Tronick, 1988), but it also enables parents to use visual distraction as an emotion regulation strategy with very young offspring. Consistent with this view is Rothbart's report of an association between individual differences in visual disengagement and soothability in young infants together with a general increase in soothability between 3 and 6 months of age (see Rothbart et al., 1992).

With increasing age, the regulation of emotion through the management of attention processes becomes more complex. The redirection of attention is commonly enlisted by caregivers as a means of regulating emotion in children, for example, during threatening or stressful events, when caregivers may focus attention on positive features of the experience, distract the child during the event itself, or limit the child's knowledge of potentially upsetting information (Miller & Green, 1985). With the assistance of caregivers, young children can also sometimes regulate their emotions themselves, using such attention management strategies as covering their eyes or ears in emotionally arousing situations, removing emotionally evocative stimuli, or leaving the situation altogether (e.g., Altschuler & Ruble, 1989). Indeed, such approaches to the self-regulation of emotion are among the earliest strategies observed in young children: attention-based strategies have been observed in 4- and 5-year-olds in the presence of adults arguing (Cummings, 1987), and such strategies can be understood and articulated by even younger children (e.g., one 28-month-old was reported as saying, "I scared of the shark. Close my eyes"; Bretherton, Fritz, Zahn-Waxler, & Ridgeway, 1986). In situations involving delayed rewards, redirection of attention away from the reward while awaiting permitted access is a behavioral strategy commonly observed in children between the ages of 2 and 6 years (Mischel & Mischel, 1983; Vaughn, Kopp, Krakow, Johnson, & Schwartz, 1986).

As children acquire more complex, psychologically oriented concepts of emotion, their strategies for the self-regulation of emotion increasingly involve the *internal* redirection of attention, for example, thinking pleasant thoughts during a distressing or frightening experience or self-coaching that focuses on positive outcomes (e.g., Band & Weisz, 1988). Even young children are aware that the intensity of emotion experience tends to wane over time as people cease to think about emotionally arousing events (Harris, Guz, Lipian, & Man-Shu, 1985) and that "behavioral distraction"—such as doing something else that takes your mind off emotionally arousing circumstances—can help you manage your emotions (Altschuler & Ruble, 1989). In one study, 8- and 13-year-olds in an English boarding school knew, for example, that thinking about positive aspects of the situation could help alleviate feelings of loneliness when away from home (Harris & Lipian, 1989), and, according to American children of the same ages, inter-

nal distraction helps while waiting during a delay task (Mischel & Mischel, 1983). Knowledge of these internal attention management strategies provides a very effective means of regulating one's own emotions because they can be used in situations where escape or avoidance of emotionally arousing stimuli is impossible. In these situations, what is regulated is the focus of attention and the intake of information that affects one's emotional condition.

### *Construals of Emotionally Arousing Events*

At other times, emotion is regulated through other components of information processing. Rather than restricting the intake of emotionally arousing information, individuals emotionally self-regulate by altering their interpretations or construals of this information. This is classically illustrated by defense mechanisms that reduce anxiety and other negative emotions through denial, projection, rationalization, repression, etc., with the result that construals of reality are altered and emotion is thereby managed (cf. Case, Hayward, Lewis, & Hurst, 1988). Other examples are children who reinterpret the outcomes of scary stories in more emotionally satisfying ways (e.g., "He didn't *really* die; he just got frightened and ran away") or who think "it's just pretend" when listening to a sad account (cf. Meerum Terwogt, Schene, & Harris, 1986).

Like most of the avenues to emotion regulation discussed in this essay, children's construals of emotionally arousing situations are often the target of extrinsic regulatory efforts, especially when offspring encounter potentially stressful or challenging experiences (Miller & Green, 1985). Before intrusive medical examinations, for example, parents may liken the procedures to "tickling," or they may exaggerate their delight during a carnival ride when the child appears frightened or look positive when children are approached by unfamiliar but harmless adults. Such strategies are potentially risky if they present children with a construction of current experience that is significantly different from the child's own or if they regularly contribute to the development of dysfunctional inferential biases (as may happen with the offspring of parents with affective disorders; see Cicchetti, Ganiban, & Barnett, 1991; Zahn-Waxler & Kochanska, 1990). But they provide a significant means for emotional arousal to be externally managed by altering the child's construction of the event when emotionally arousing experiences are unavoidable.

Children also create their own interpretive constructions of emotionally arousing experiences, of course, and these constructions commonly focus on the achievement or frustration of personal goals and inferences concerning the causes of success or failure that can have powerful emotional conse-

quences (e.g., Graham & Weiner, 1986; Stein & Levine, 1989; Stein & Trabasso, 1989; Thompson, 1987a, 1989). Not surprisingly, kindergartners are aware that goal substitution is a reasonable response to feelings of sadness or anger that have been evoked by the frustration of their initial goals, probably because goal substitution has consequences for emotion management (Stein & Trabasso, 1989). For example, a child who learns that a parent does not have time for a bedtime story might decide that playing a game or listening to music is just as good, and this reinterpretation of the event can help regulate feelings of sadness or dismay. Altering one's causal attributions for emotionally arousing events is another way that reconstructions can have emotionally regulatory consequences (e.g., "Tommy probably didn't *mean* to knock over my tower"), and this strategy is often used by adults, although there have been no studies of children's understanding of this approach to the management of their emotion experiences. In sum, when these kinds of internal or extrinsic regulatory strategies are employed, what is regulated is one's interpretations of emotionally meaningful information.

#### *Encoding of Internal Emotion Cues*

Another answer to the question, What is regulated? is that individuals commonly manage their encoding of internal cues of emotional arousal when they regulate emotion. In other words, emotional arousal is managed not only by reinterpreting the circumstances eliciting emotion but also by reinterpreting the internal indicators of emotional arousal, such as rapid heart rate, increased breathing rate (or shortness of breath), perspiration, and other concomitants of emotional arousal. One manner of managing stage fright, for example, is to regard these physiological cues as the ordinary accompaniment to appearing before an audience rather than as signals of impending dysfunction. Similarly, children who can more easily channel emotional arousal into adaptive social functioning have perhaps learned to regard their internal cues of arousal as facilitating (e.g., empowering) their goals, while children who are more easily undermined by heightened emotion may perceive these internal cues of arousal as reflections of their incompetence or inadequacy. At present, however, we have little knowledge of how children understand these internal cues of emotional arousal or their management. Nor do we know how parents influence these constructions of offspring.

#### *Access to Coping Resources*

Emotion regulation also occurs by enhancing one's access to coping resources, both material and interpersonal. In this sense, what is regulated

is the availability of external support for managing emotional arousal. Adults turn to friends and family for advice when anxious, comfort when bereaved, and a cool head when angry, and young children are aware of the benefits of eliciting nurturance from others when experiencing negative emotion (Masters, Ford, & Arend, 1983; McCoy & Masters, 1985). In these cases, access to coping resources is enhanced by seeking familiar and trusted social partners, and this mode of emotion regulation begins early in life. Indeed, the “secure base behavior” commonly observed in infants who encounter threatening or stressful circumstances with their caregivers reflects the extent to which access to interpersonal coping resources can assist in emotion management from a very early age. The social expectations underlying a secure infant-mother attachment suggest that this perceived access can have broader consequences for socioemotional functioning (see also Cassidy, in this volume). Moreover, parents also enlist the aid of material coping resources (e.g., a favorite toy, blanket, or book) to assist their offspring in coping with emotional demands.

With increasing age, access to coping resources as an aspect of emotion regulation becomes more planned and strategic. Friends are sought out for their emotional support and understanding (Gottman & Mettetal, 1986), and peers may be selected as confidants who have been especially sympathetic on previous occasions. Indeed, when others are expected to be supportive, children may sometimes enhance the intensity of their expressed emotion in order to foster a desired reaction from another that supports one’s own emotionally self-regulatory efforts (Dunn & Brown, 1991; Saarni, 1992). For example, a child may exaggerate the hurt that she experiences when tripping and falling to elicit sympathy rather than derision from peers who are looking on as well as to avoid embarrassment, and this helps her feel better. By age 6, children are aware that emotion displays can be altered to mislead onlookers about the quality of one’s distress (Harris & Gross, 1989), but we know little about their capacity strategically to manipulate their emotion displays for purposes of emotion regulation, and this constitutes another important research task. As an aspect of emotion regulation, however, enhancing access to coping resources—especially interpersonal resources—can entail the strategic as well as the incidental use of social partners and material resources.

### *Regulating the Emotional Demands of Familiar Settings*

Another answer to the question, What is regulated? is that emotion regulation commonly involves predicting and controlling the emotional re-

quirements of commonly encountered settings. That is, emotion experience is managed as one selects and creates living circumstances that have manageable emotional demands.

Like other modes of emotion management, regulating the emotional demands of familiar settings is one way that parents extrinsically manage the emotion experience of offspring. They often restrict or expand the opportunities for emotional arousal experienced by young offspring by controlling the emotional demands of caregiving routines and other common experiences (e.g., frequency of parent-child separations, promptness of responding to distress cries, etc.). In doing so, parents take into account both their own child's temperamental strengths and vulnerabilities and the socialization demands of the emotion culture. Thus, one parent may use somewhat nondemanding or permissive childrearing practices in light of her child's proneness to distress but will nevertheless increment expectations for emotional tolerance as the child's increasing age permits greater emotional self-control.

With increasing maturity, however, individuals become more capable of selecting or constructing environmental settings in light of their self-perceived needs and characteristics, including consideration of the emotional demands with which they are comfortable (Lerner & Busch-Rossnagel, 1981). Within certain limits, for example, social relationships are chosen, home and workplace settings crafted, and commitments scheduled to create desirable incentives, supports, and expectations, including manageable emotional requirements. For young children, this may involve making choices as simple as playing alone or with congenial peers rather than selecting competitive games; for older people, the range of choices can be much broader. Although this necessarily leads in idiosyncratic directions according to individual constellations of personality and temperament, there are also some developmental trends in the kinds of emotional demands that adults integrate into the environmental and interpersonal settings that they select.

Carstensen (1991; Fredrickson & Carstensen, 1990) has noted, for example, that older adults select settings and relationships that ensure manageable and predictable socioemotional demands, maximize positive affect, and conserve physical energy. Their capacity to regulate the emotional demands that they experience is also reflected in their ability to restructure their lifestyles to accommodate unexpected emotional needs (e.g., clearing the schedule for a mid-afternoon "time-out"), escape from a given situation (e.g., by a spontaneous or planned retreat), or renew or strengthen ties to supportive individuals (e.g., by more frequent visits, calls, or letters to a sibling or an offspring). These ways of structuring and restructuring one's lifestyle can have emotionally managing functions at all ages.

*Selecting Adaptive Response Alternatives*

A final answer to the question, What is regulated? is that emotion regulation commonly involves expressing emotion in a manner that has satisfactory consequences—in other words, that is concordant with one's personal goals for the situation. For adults, this might entail enlisting anger in a search for solutions or a persuasive argument rather than insults or physical attack. For a preschooler, this might involve insisting that a peer who has destroyed a block tower help reconstruct it rather than angrily attacking the perpetrator or using language to negotiate a parent's demands rather than erupting into angry crying. In each case, it is not just that emotion is regulated in order to achieve personal goals (e.g., reconstructing the tower, finding a solution) but that the expectation of goal achievement also facilitates emotion regulation because of the prospect of beneficial outcomes. In this respect, the availability of satisfactory response alternatives can promote emotion management by offering modes of emotion expression that have predictably satisfactory outcomes for the individual. By implication, emotion regulation is undermined when there is a very limited range of response possibilities or, alternatively, when existing options are perceived to lead consistently to undesirable outcomes.

Students of display rules have noted, of course, that individuals often minimize or intensify the expression of felt emotion and that doing so commonly has emotionally managing consequences (cf. Saarni, 1990). There are, of course, situations in which managing emotional responses has little effect on underlying emotion experience, especially when arousal is strong and salient. Moreover, certain modes of expressing emotion (such as venting anger) can undermine rather than enhance emotion regulation. The strong connections between emotional feeling and emotional responding suggest, however, that emotion regulation is often best accomplished by altering how one expresses emotion—especially when there are available means of conveying emotion that can help accomplish one's goals. In these situations, emotion management occurs because emotion has potentially satisfactory outlets.

This analysis implies that, as young children acquire a broader repertoire of modes for expressing emotion (owing to developmental changes in expressive capabilities as well as a broadened behavioral repertoire), their capacities for emotion regulation are likely to be enhanced as this repertoire is strategically employed. For example, in her longitudinal home-observational study of young children, Kopp (1992) noted that crying peaked in frequency late in the second year, with a progressive decline in crying throughout the third and fourth years. This trend replicates observations by earlier investigators, and Kopp has suggested that crying declines at this time because this is when language emerges as a significant alternative

means for expressing emotion and emotion-related experiences (indeed, older children in her study showed many more verbal refusals and “off-task negotiations” in circumstances where younger children simply fussed). In many circumstances, language can express emotion more effectively than crying while at the same time accomplishing situational goals, and this may account for its enhanced utility during the preschool years.

With increasing age, the range of expressive alternatives for emotion broadens, of course, but the expression of emotion also begins to be channeled in directions that the emotion culture finds acceptable. This is because, on the basis of the socialization practices of parents and other authorities, children acquire emotion schemas that, among other things, guide their predictions of the consequences of expressing various emotions in certain situations (cf. Saarni, 1990). For example, on the basis of the verbal (e.g., “Use words rather than hitting”) and behavioral guidance of socialization agents, they learn the consequences of responding to an aggressive peer by taking revenge, crying, tattling to adults, or asserting themselves. In doing so, they can more thoughtfully evaluate these alternatives in terms of their relative suitability for accomplishing personal goals in particular circumstances.

The reactions of others are, of course, especially important in evaluating the predictable consequences of different modes of emotional responding for accomplishing one’s goals. Because of this, some reactions will be better suited to certain social settings than others and will thus better advance one’s regulation of emotion. Recourse to an adult when frustrated by a peer may be praised by a preschool teacher but regarded negatively by a parent. Similarly, crying may be maladaptive for toddlers in some settings (e.g., when used to resist the mother’s request to clean up toys) but accomplish valuable strategic ends in others (e.g., when calling attention to sudden danger or an older sibling’s aggression). In short, the most adaptive means of expressing an emotion is often situation specific rather than trans-situational and is based on the child’s expressive repertoire, the demands of the setting, the goals of the child, and the values of social partners. This can be a complex calculus (as most adults know from experience with emotionally charged situations) and suggests not only that selecting an adaptive response alternative can be complicated but also that this facet of emotion regulation is tied to the growth of social cognition and social competency in childhood.

### *Implications*

There are clearly diverse developmental pathways toward emotion regulation, deriving both from the efforts of external agents to manage the



emotions of children and from the child's growing capacity to self-regulate (for an insightful analysis, see also Calkins, in this volume). These are built on emerging neurophysiological foundations for arousal regulation and include controlling attention processes, altering construals of emotionally arousing situations, modifying the encoding of internal emotion cues, strengthening access to coping resources, regulating the emotional demands of familiar settings, and selecting adaptive modes for expressing emotion. Each of these pathways provides different answers to the definitional question, What is regulated?

Competent emotion regulation can thus involve any of these processes, taken individually or in combination. Because we know very little about developmental changes in the use of these strategies and their consequences for children's management of emotion, the tasks of constructing a developmental analysis of the growth of emotion regulation skills and identifying the origins of individual differences in capabilities for emotion management are complex indeed. In embarking on these tasks, for example, it is important to understand the diverse constituents of developmental growth in emotion regulation skills. To what extent does growth in emotion management skills derive (*a*) from children's developing awareness of the *need* for emotion regulation, (*b*) from a growing repertoire of emotion regulation strategies (if so, which ones emerge at which ages?), (*c*) from enhanced strategic knowledge of the potential utility of different regulatory approaches in different situations, (*d*) from growing flexibility in substituting one regulatory approach for another, (*e*) from an emerging capacity to adapt regulatory strategies to different contexts and situational demands, and (*f*) from enhanced skills at evaluating (or predicting) the relative success of different regulatory approaches?

New inquiries may also be made concerning the nature and origins of individual differences in emotion regulation among children of a given age. To what extent do these derive (*a*) from relying on different regulatory strategies, (*b*) from using strategies that differ in their predictable success, (*c*) from using strategies that are situation specific rather than transsituational (i.e., that vary in their flexibility), (*d*) from using an impoverished as opposed to a rich repertoire of alternative regulatory strategies, (*e*) from a limited understanding of the conditions in which different emotion regulation approaches are useful, suitable, or potentially successful, and (*f*) from situationally specific success in emotion regulation that is not generalized? These questions and related inquiries constitute an important agenda for future research on emotion regulation and will likely provide considerable insight into processes of emotional development in general as they contribute to an awareness of how emotion changes with increasing age beyond the unfolding of a capacity for discrete emotions.

At the very least, however, the heterogeneity of these emotion regula-

tion processes cautions against regarding the development of emotion regulation as a homogeneous growth process, instead underscoring that *emotion regulation* is a conceptual rubric that encompasses a variety of behavioral strategies, each with likely different developmental timetables and experiential origins.

### EMOTION REGULATION AND SOCIAL INTERACTION

The development of emotion regulation has become a central interest of functionalist theorists, who believe that emotion is constituted by the ongoing transactions between individuals and their environments. Within this view, “families” of emotion are crucial to social signaling, communication of needs, enhancement of affiliational ties, self-defense, and other important goals. Strategies of emotion regulation enlist emotion to achieve these goals. The functionalist analysis suggests that social encounters provide the most salient contexts for exercising skills of emotion management and that the efficacy of these skills depends significantly on the responses of social partners and the demands of the social setting as they are pertinent to one’s goals. In this view, exploring how the development of strategies of emotion regulation fits into the fabric of social relationships is thus an important task in elucidating the functional significance of processes of emotion management and control.

The social context affects emotion regulation in a variety of ways. One obvious way is that social partners regulate our emotions from early in life. Generalizing from studies of rats, Hofer (in this volume) illustrates the powerful effects that relationships might have on regulating physiological homeostasis and the emotions associated with early attachment and bonding. In humans, a major task of successful parenting is managing and guiding the emotion experience of offspring. This occurs not only through direct intervention to relieve distress, fear, frustration, and other negative emotions (cf. Gekoski, Rovee-Collier, & Carulli-Rabinowitz, 1983; Lamb & Malkin, 1986) but also through modeling and selective reinforcement of positive emotion expression (e.g., Malatesta-Magai, 1991), the direct induction of emotion through such processes as affective contagion, empathy, and social referencing (e.g., Stern, 1985; Thompson, 1987b; Walden, 1991), verbal instruction about emotion and emotion regulation strategies (Dunn & Brown, 1991; Miller & Sperry, 1987), and the control of opportunities for emotional arousal through the organization of caregiving demands and the environment of early development (e.g., early independence training, quality of out-of-home care, etc.). In these and many other ways, caregivers extrinsically manage emotion experience through the emotional demands

that they impose on young children and the interpersonal supports that they provide for containing emotional arousal within manageable limits.

With the child's increasing age, the emotional demands of caregivers and the strategies that they use for managing the emotions of offspring evolve in accordance with the child's growing repertoire of emotions and developing skill at emotion management and the changing demands of the emotion culture (e.g., Lewis & Michalson, 1983; Miller & Sperry, 1987; Saarni, 1990). Parents have fairly clearly defined expectations for the emotional behavior of their offspring that change with situational demands and the child's developing capabilities for the self-management of emotion, and they use a broadened range of direct and indirect influence strategies to socialize the child's emotional behavior. But direct efforts to regulate another's emotion are not limited to socialization processes in childhood. As adults, we seek to manage the emotions of others by extending a sympathetic ear or reassurance, emphasizing the consequences of neglected responsibilities, using humor in a distressing situation, and in other ways altering another's experience of emotionally relevant events.

These influences are especially important in the context of meaningful and long-standing social relationships. Such relationships are important not just because partners can have mutual, long-term effects on the arousal and management of emotion but also because of the emotional dimensions of the relationships themselves and the social expectations that they engender. Because attachment figures, friends, parents, spouses, offspring, and significant others constitute valuable interpersonal resources for coping with emotion, expectations concerning their accessibility, helpfulness, and sensitivity can significantly enhance—or undermine—the capacity to manage emotional arousal. A child can more easily cope with a distressing experience because of the anticipated understanding provided by a parent, a friend, or a sibling (as suggested by the research reported by Field, in this volume). Conversely, the anticipation of an uncaring or a denigrating response might cause children to restrict the range or vitality of their expressions of emotion in the presence of such partners or to experience difficulty in coping with strong arousal.

As Cassidy (in this volume) has commented, individual differences in adult attachment representations as well as infant attachments may be associated with distinct styles of emotion regulation that entail minimizing or enhancing different emotions in interaction with attachment figures. In other words, on the basis of expectations concerning the partner's availability and sensitivity, infants as well as adults may learn to disguise or enhance the expression of feelings in a relationship (cf. Thompson & Lamb, 1983). While it is certainly true that there are multiple catalysts underlying these differences in attachment and attachment representations, social expecta-

tions may be one important influence on the development of strategies for regulating emotion and emotion displays within these relationships.

In addition to the expectations engendered by close relationships, social partners also influence emotion regulation by affecting the interpretation of emotionally arousing situations and the coping resources that are available. They may reinforce attributional styles that enhance or inhibit certain emotions (e.g., "It's *not* your fault!") and may foster certain coping responses by direct instruction or modeling, by providing instrumental or material assistance, or by offering counseling and emotional sustenance (cf. Miller & Sperry, 1987). For example, offspring who regularly observe parents suppress emotion displays, perhaps in conjunction with verbal comments (e.g., "We don't have to fly off the handle!"), are likely to internalize such strategies as first-resort approaches to managing their own emotion experiences. Furthermore, these relationships may themselves impose emotional demands that can undermine as well as enhance effective regulatory efforts. While offering significant support, close relationships are often simultaneously sources of emotional stress or turmoil that can also affect efforts to manage emotion (Thompson, 1992).

In sum, the development of emotion regulation is well integrated into the fabric of social relationships not only because of the direct and indirect ways that people seek to manage emotion in others but also because of the social expectations generated by close relationships with friends and relatives (especially expectations of support and understanding), their influence on how individuals interpret emotionally arousing situations and the resources that are available to them, and the emotional dimensions of these relationships, including the demands as well as the support that they provide.

Recent research in developmental psychopathology provides informative, albeit distressing, illustrations of the diversity and importance of the influence of relationships (Thompson, Flood, & Lundquist, in press). Young offspring of parents with affective disorders are at heightened risk of emotion regulation problems owing not only to the caregiver's limited availability as a source of emotional support but also to the adult's modeling of negative attributional styles and use of discipline practices that enhance the child's feelings of responsibility and helplessness (Zahn-Waxler & Kochanska, 1990). Parent-child relationships shape not only children's construals of emotionally arousing situations but also their resources for regulating emotion: these offspring (like their parents) have difficulty devising appropriate strategies for modifying emotion and lack confidence in the efficacy of these strategies (Garber et al., 1991). Children from homes characterized by marital conflict show a heightened sensitivity to distress and anger that is manifested in excessive guilt and diminished coping with adult arguments

(Cummings, Zahn-Waxler, & Radke-Yarrow, 1984; Cummings et al., 1989; Katz & Gottman, 1991). The effects on emotion regulation of the emotional demands of distressed caregivers are manifested most clearly in children maltreated by their parents, who sometimes respond with depressed affect, heightened lability, or marked anger (Gaensbauer & Sands, 1979). Thus, diverse facets of significant relationships—expectations of helpfulness or insensitivity, the partner's influence on the interpretation of emotionally arousing situations, instruction in and modeling of strategies for managing emotion, and the emotional requirements of these relationships themselves—can have important effects on the development of emotion regulation strategies.

Thus far, we have been considering how relationships affect the development of emotion regulation. But it is important to note that the reverse is also true: emotion regulation strategies can significantly influence the course of social interaction and the development of social relationships. In a series of well-known investigations, Dodge and his colleagues have found that aggressive children tend to be deficient processors of social cues—especially when they feel threatened—and consequently construe hostile intent in ambiguous or uncertain social encounters with peers (e.g., Dodge, 1991a; Dodge & Somberg, 1987). But it is quite likely that deficiencies in emotion management as well as social information processing contribute to their social dysfunction: under threatening circumstances, the affective salience of social cues, their interpretation, and the thoroughness of one's search for and evaluation of alternative response options are all likely to be affected by skill at self-regulating emotion. Children who can “keep their cool” when threatened may be better able to think carefully about the situation and devise competent and successful response strategies. In a sense, emotion management may be both a contributor to and a result of the quality of social information processing that leads to successful or unsuccessful encounters with peers.

Needless to say, the development of the skills involved in emotion management is affected by a panoply of significant relationships in varied settings: in the context of parent-child relationships, out-of-home care settings, peer interactions, school settings, and, later, workplace associations, strategies for emotion self-regulation are fashioned and refined. A number of important questions arise from such an analysis. Given the challenges to “emotional competence” in troubled parent-offspring relationships noted above, for example, can children acquire more successful strategies of emotion management through extrafamilial support, such as with a teacher or with peers? Are there qualitatively different kinds of emotion regulation strategies—or skills for different emotional demands—acquired in peer as opposed to family contexts? Finally, how do variations in the “emotion culture” (Gordon, 1989) observed cross-nationally affect the interpretation of

emotion experience and the requirements for the self-regulation of emotion? These and other questions are fascinating catalysts for the study of the development of emotion regulation, and especially of individual differences in regulatory capacities, in the context of close relationships.

### THE CORRELATES OF INDIVIDUAL DIFFERENCES IN EMOTION REGULATION

Current enthusiasm for the study of emotion regulation doubtlessly also derives from its practical applications. The study of emotion regulation provides an arena within which problems of social competence and incompetence, behavioral self-control, and even intellectual and cognitive functioning can be regarded in a new light. By characterizing these differences as partly a function of individual differences in emotion regulation processes, researchers not only contribute new ideas about the origins of these social and cognitive differences but also begin to identify new intervention and remediation strategies. Implicit in these efforts is the view that differences in emotion regulation skills can be reliably identified and that a coherent formulation of adaptive or “optimal” emotion regulation can be framed as a guide to intervention efforts.

The preceding discussion indicates why this is both a worthwhile goal and a compellingly challenging one. Because emotion regulation encompasses heterogeneous developmental processes, individual differences in emotion regulation are likely to occur along multiple dimensions rather than on a single axis. Individuals likely vary, for example, in their knowledge of the need for emotion regulation in specific situations, their awareness of alternative strategies, their flexibility in applying different regulatory strategies, and other components of emotion control. There is no necessary reason why individuals should exhibit deficiencies in all aspects of emotion regulation or in all situations; individual patterns of skill, difficulty, and compensation may be the rule. This makes the tasks of identifying the nature of these individual differences and of designing effective intervention approaches considerably more complex.

Adding to this complexity is the need to define clearly rather than intuitively what we mean by *optimal* emotion regulation (or, on the other hand, emotion *dysregulation*). As Cole, Michel, and Teti (in this volume) have noted, various clinical approaches emphasize different facets of optimal regulation, and most are difficult to operationalize. In general, *optimal* emotion regulation could be defined for either clinical or research purposes as a process or an outcome. Many formulations of emotion regulation regard optimal regulation in terms of its outcomes: the individual is capable of keeping emotions under sufficient control to allow for interpersonal relat-

edness and sociability, prosocial initiatives when appropriate, sympathy toward others, personal assertiveness when needed, and/or other indices of successful functioning. Effective emotion regulation is believed to be an ingredient of these behaviors, and signs of “emotion dysregulation” are commonly perceived in the absence of these capacities. But, in other respects, optimal emotion regulation can be regarded as a process: the enlistment of strategies that permit flexibility, quick reappraisals of emotionally provoking situations, access to a broad range of emotions, and efficient goal directedness. In this respect, *emotion regulation* is defined in terms of the quality of emotion that results, regardless of its other behavioral consequences.

The problem with these formulations is that the construct *optimal emotion regulation* is so broadly defined that it becomes confounded with intuitive values of what a well-functioning personality is like. Like the construct of ego control that characterized earlier research on personality development, emotion regulation is often regarded by contemporary researchers as a stable component of personality functioning with broad manifestations in diverse behavioral domains, with those who are “optimally” regulated showing many positive sociopersonality characteristics that avoid the excesses of either under- or overregulation. In these circumstances, it is helpful to remember that *optimal emotion regulation* (or *emotion dysregulation*) is often better defined by the demands of the immediate social situation and the goals of the individual than as a global, personological construct. What is “optimal” may vary for different individuals, in different situations, and with different goals.

Consider, for example, the case of a child who gets angry at a peer who has wronged her. In that situation, does “optimal” emotion regulation involve retaliation, or tattling to an authority, or avoiding the perpetrator, or insisting on the perpetrator’s apology, or crying—or some combination of these responses? I suspect that this depends on many factors that are specific to this situation, such as the child’s power relative to that of the wrongdoer, the values of the adults to whom the child might turn, the behavior of other children in the setting, and the overarching values of the sociocultural milieu (cf. Miller & Sperry, 1987). I suspect that “optimal” emotion regulation also depends on the child’s goals for that situation. In this example, these goals might include reestablishing a sense of personal well-being, ensuring that the wrongdoing does not recur, reestablishing good relations with the perpetrator, restoring a sense of esteem within the peer group—or some combination of these. In other words, emotion management does not necessarily involve diminishing unpleasant affect (although it may); depending on the child’s goals, anger might be enhanced (to stand up to the perpetrator), modulated (to enlist the assistance of friends in

self-defense), or blended (to provoke an adult's intervention through salient distress). In a sense, the "optimal" choice depends on the child's goals for a given situation.

Similar questions can be raised about other features of individual variations in the self-regulation of emotion. In certain circumstances, for example, well-regulated emotion sensitizes the child to the emotions of others and fosters an appropriate emotional response to them. In these situations, the optimal self-regulation of emotion is likely to be associated with empathy and prosocial initiatives (cf. Eisenberg & Fabes, 1992b). In other circumstances, however, this is a potentially dysfunctional outcome, such as when the child witnesses domestic violence (and is thus at considerable risk by intervening prosocially) or has a parent with an affective disorder (in which case empathy may be disorganizing). Given differing circumstances, optimal emotion regulation processes may yield different behavioral outcomes—indeed, one might regard a child's manifest distress or avoidance as a more "optimal" self-regulatory strategy than one that yields emotional engagement in a parent's personal turmoil.

Children do, of course, acquire characterological styles of emotion management that become increasingly important facets of successful or dysfunctional aspects of personality functioning with increasing age. But a premature research focus on identifying and labeling these styles may cause researchers to miss noticing the social-contextual processes and personal goals that help define what *optimal* regulation is *in that context*. Researchers may also neglect the fact that children can be effective managers of their emotions in some situations (e.g., encounters with peers) and not in others (e.g., sibling interactions) or that they may effectively accomplish some emotional goals and not others. Moreover, in situations involving extreme emotional demands (such as child maltreatment, marital conflict, or a parent's psychopathology), "optimal" emotion regulation may be manifested in behavior that looks very different from what a more typical, well-functioning personality manifests. Finally, a research emphasis on the social-contextual constituents of emotion regulation will also sensitize researchers to the standards by which members of a culture (and subculture) define *optimality*.

In the future, I suspect that individual differences in emotion regulation will be defined much less globally and in a manner that is far more situationally specific than is presently the case, with careful attention to the nature of the child's goals, other developmental capacities, and the contextual demands that the child faces. This will contribute, I hope, to a developmental picture in which individual patterns of compensation and specialization, rather than "optimality" and "dysregulation," characterize our portrayals of developing individuals. And, in this context, I suspect that future research will link the growth of emotion regulation to the growth of



self-understanding and of social cognition as these processes are jointly involved in the child's construction of emotion and its functions in social contexts.

## NEW APPROACHES TO THE STUDY OF EMOTION REGULATION

Definitions of psychological processes are closely allied with measurement strategies, so it is perhaps appropriate that this essay close with a brief overview of new methodological approaches to the study of emotion regulation that have been explored in my lab with students and colleagues. The purpose in doing so is not to propose that these approaches are necessarily useful for all research purposes but rather to contribute to the variety of research methods that are currently available to researchers in this burgeoning field of study.

Consistent with the definition of *emotion regulation* discussed earlier, our methodological strategy has focused on measuring the dynamic features of emotional responses observed in the infants we have studied. This is because some of the most informative features of emotional arousal entail not variations in discrete emotions (which often covary) but rather changes in the temporal and intensive features of emotion that reflect the appraisal and regulatory processes related to emotion and that, in turn, influence many of the functional properties of expressions of emotion (such as the reactions that they elicit from social partners). We call these response features *emotion dynamics* because, while the discrete emotion may “play the tune” of an individual's response, emotion dynamics (like the dynamic markings on a musical score) significantly influence quality, intensity, timing, and modulation and thus significantly color emotionality. These response parameters have long interested students of infant temperament and child clinical researchers (especially those concerned with emotion regulation), but they have seldom been effectively operationalized in studies of early emotional development. This is the task that we have undertaken, together with studying the meaning and correlates of individual differences and developmental changes in these dynamic features of emotional responding.

We use either continuous time-sampled ratings or on-line temporal assessments of facial and vocal measures of emotion to index response parameters like the *latency* of the response (i.e., time from the onset of the eliciting stimulus until onset or peak of the emotional response), *rise time* (i.e., time from the onset of the emotional response until peak intensity is achieved), *persistence* (i.e., duration) of the emotional reaction, and *recovery* (i.e., time from the terminus of the eliciting stimulus until emotional responses reach a neutral baseline). More broadly, we also examine the *range* and *lability* of emotional responsiveness as well as indexing the *intensity* of

emotional reactions over short- and longer-term periods (see Thompson, 1990).

Needless to say, these response dynamics are multidetermined: many factors are influential in shaping the latency, intensity, and other characteristics of an emotional response, some of which involve emotion regulation processes. Consequently, we have examined these response parameters in the context of specific hypothesis-testing studies in which we have sought to predict group differences in these emotion dynamics on the basis of characteristics of the infants themselves or of their experiential history that might contribute to differences in emotion regulation. Such an approach addresses the study of emotion regulation strictly in terms of its influence on emotional response parameters, somewhat independently of the broader consequences for psychosocial functioning.

In one study, for example, the emotion dynamics of a sample of Down syndrome (DS) infants in the Strange Situation procedure were compared with those of a sample of typical infants observed twice in this procedure: once when their ages were equivalent to those of the DS sample and also earlier, when their mental age was more comparable to that of the DS sample. Our purpose was to evaluate whether the emotion dynamics of Down syndrome infants were uniquely different from those of the comparison sample or could instead be interpreted in terms of the DS infants' cognitive lags (Thompson, Cicchetti, Lamb, & Malkin, 1985). Our results indicated that the emotional responses of the DS sample differed significantly from those of the typical sample at *each* age: Down syndrome infants showed diminished emotion intensity, a decreased emotion range, limited lability, a more prolonged latency to distress onset during separation episodes, but a quicker recovery during reunions compared with typical infants regardless of whether they were matched for age or cognitively comparable to the DS sample.

These differences suggest that the organization of emotional behavior for DS infants is unique owing both to their physiological difficulties in modulating arousal and to the cognitive retardation that blunts the speed and efficiency of their appraisals of situations and events. Both physiological and cognitive factors regulate the emotional behavior of DS (and typical) infants via attention, interpretive, as well as physiological processes. This conclusion has had, in turn, important implications not only for our understanding of how DS infants manage to address the socioemotional challenges of early growth but also for intervention and parent education (cf. Cicchetti, 1990).

In other studies, we have examined whether the difficulties in alertness, physiological stability, and arousal modulation commonly observed in premature babies would be manifested in differences (compared to full-term infants) in their regulation of emotional arousal at the end of the first year.

We discovered that the emotion dynamics of relatively healthy preemies (i.e., without compromising medical complications) were no different than those of typical infants at 12 months (Frodi & Thompson, 1985) but that medically compromised premature infants showed significantly different dynamics in their emotional behavior in the second year that reflected their continuing difficulties modulating arousal (Stiefel, Plunkett, & Meisels, 1987). Such findings not only underscore the importance of considering the long-term influences of early biological insult on emotion regulation but have also indicated how the quality of infant-caregiver interactions can support healthy emotional responsiveness in both healthy and medically compromised premature infants.

In these studies as well as others (e.g., Connell & Thompson, 1986; Thompson, Connell, & Bridges, 1988; Thompson & Lamb, 1984), we have examined differences in emotion dynamics in the context of attachment and found that variations in emotionality assume a central role in the nature and stability of the differences between securely and insecurely attached infants. These differences in emotion dynamics have temperamental as well as nontemperamental origins (cf. Belsky & Rovine, 1988) and are likely shaped by the ongoing features of caregiver-infant interaction that affect other components of attachment-system functioning (cf. Thompson & Lamb, 1983). This conclusion is consistent with emerging views of how early caregiving contributes to the development of “emotional biases” in infants (Malatesta, 1990) as well as of the role of temperamental individuality in emotion regulation.

More recently, we have explored developmental changes in the dynamics of emotion in a longitudinal study of infants observed in mother-infant play, an encounter with a stranger, and a separation episode at ages 6, 9, and 12 months (Thompson, 1990). This half year of life is a period of striking changes in emotion regulation owing to rapid cognitive advances that affect emotion appraisals (e.g., the growth of means-ends understanding and of evocative memory skills), neurophysiological maturation in the frontal lobes related to arousal regulation, the consolidation of social expectations for familiar partners, the emergence of social referencing as a means of construing emotionally arousing events, and the growth of self-propelled locomotion, which alters the child’s transactions with the social and nonsocial world in that it offers a new potential for goal attainment and feelings of self-efficacy and frustration (Campos, Kermoian, & Zumbahlen, 1992). Consequently, we expected that across this developmental transition infants would show progressively enhanced emotion intensity, growing persistence in their emotional responses, and decreased response latency and rise time in their reactions—indicators, in short, of growing emotional “vitality.”

This is precisely what we found across *both* positive and negative emotion elicitors. That is, regardless of whether infants were positively or nega-

tively aroused, they showed greater speed and intensity in their emotional reactions from 6 to 12 months owing, in part, to the regulatory changes in emotionality outlined above. This emotional “vitality” appears to assume an important role in the nature of the infant’s transactions with the social world during this period (cf. Tronick, 1989).

However, even though these developmental changes in emotionality were consistent across positive and negative situations, the valence of the reaction *did* make a difference for the organization of these dynamic features. To summarize briefly, negative emotional arousal in infants was characterized by a biologically based “emergency reaction” in which high distress intensity was accompanied by a short latency, long persistence, but prolonged rise time to provide a rapid mobilization of the baby’s resources in the face of threat and to evoke a preemptory response from adult listeners. By contrast, high positive emotional arousal involved a longer latency, a shorter escalation to peak intensity, and much less persistence, fostering a more sustained appraisal of situational events and a capacity to respond to changes in those events but also an ability to become quickly engaged in positive stimulation. In sum, these findings indicate significant developmental changes in emotion dynamics from 6 to 12 months against a background of a consistent organizational structure of these dynamic features, as one might predict on the basis of an appreciation of both the biologically adaptive and the psychologically flexible features of the emotion regulation processes discussed in this essay.

These studies underscore what the literature reviewed here also attests: that continued study of the development of emotion regulation processes is compelling because of the potential insights that it can contribute to our understanding of emotional growth. With greater conceptual clarity concerning the meaning of *emotion regulation* and its constituents and consequences, many of these potential contributions are bound to be realized.

## SUMMARY

Contemporary interest in emotion regulation promises to advance important new views of emotional development as well as offering applications to developmental psychopathology, but these potential contributions are contingent on developmentalists’ attention to some basic definitional issues. This essay offers a perspective on these issues by considering how emotion regulation should be defined, the various components of the management of emotion, how emotion regulation strategies fit into the dynamics of social interaction, and how individual differences in emotion regulation should be conceptualized and measured. In the end, it seems clear that *emotion regulation* is a conceptual rubric for a remarkable range of developmental

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processes, each of which may have its own catalysts and control processes. Likewise, individual differences in emotion regulation skills likely have multifaceted origins and are also related in complex ways to the person's emotional goals and the immediate demands of the situation. Assessment approaches that focus on the dynamics of emotion are well suited to elucidating these complex developmental and individual differences. In sum, a challenging research agenda awaits those who enter this promising field of study.