



Project
MUSE[®]

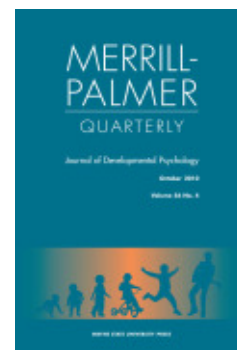
Today's Research. Tomorrow's Inspiration.

Emotion-Related Regulation: An Emerging Construct

Eisenberg, Nancy.
Champion, Claire.
Ma, Yue.

Merrill-Palmer Quarterly, Volume 50, Number 3, July 2004, pp.
236-259 (Article)

Published by Wayne State University Press
DOI: [10.1353/mpq.2004.0016](https://doi.org/10.1353/mpq.2004.0016)



 For additional information about this article

<http://muse.jhu.edu/journals/mpq/summary/v050/50.3eisenberg.html>

Emotion-Related Regulation: An Emerging Construct

Nancy Eisenberg, Claire Champion, and Yue Ma, *Arizona State University*

Emotion-related regulation is a topic of considerable current interest; however, this was not always true. We briefly discuss the history of interest in the topic and then the current state of the field, including definitions of the construct. In addition, we summarize some of the important issues for future attention, including definitional issues, topics that merit attention, and methodological and design issues. This field of inquiry is flourishing, but it is one that is rapidly expanding and improving in the quality of the research.

Emotion regulation currently is a major topic of study in developmental psychology and related disciplines or subdisciplines. This fact is reflected in the number of books and monographs on the topic that have been (or are being) published in the last decade (e.g., Baumeister & Vohs, 2004; Fox, 1994; Philippot & Feldman, in press). However, the topic was not always a popular one. Before the mid-1980s, discussion of emotion by developmentalists was relatively limited; even more rare were writings on emotion regulation. For example, in 1981, at the Biennial Meeting of the Society for Research in Child Development, there were no entries in the program index for the terms *emotion regulation* or *delay tasks*, and only one paper was under the term *self-regulation*. In 1989, the category of emotion regulation did not appear in the index; three abstracts were listed under *regulation*, three abstracts were listed under *self-regulation*, and one abstract was listed under *delay*

Nancy Eisenberg, Claire Champion, and Yue Ma, Department of Psychology.

Work on this paper was supported by grants from the National Institutes of Mental Health (1 R01 MH60838) to Nancy Eisenberg and the National Institute of Drug Abuse (DA05227) to Laurie Chassin and Nancy Eisenberg.

Correspondence should be addressed to Nancy Eisenberg, Department of Psychology, Arizona State University, Tempe, AZ 85287-1104. E-mail: nancy.eisenberg@asu.edu.

Merrill-Palmer Quarterly, July 2004, Vol. 50, No. 3, pp. 236-259. Copyright © 2004 by Wayne State University Press, Detroit, MI 48201.

tasks. Fourteen years later in 2003, the category *emotion regulation* included 53 entries, and *self-regulation* included 36 entries.

Similarly, only recently has emotion regulation been covered in any depth in developmental psychology or child development textbooks. For example, in two textbooks from the mid to late 1970s (Gardner, 1978; *Developmental Psychology Today*, 1975), cognitive development dominated the contents, and the chapters related to social-emotional development pertained primarily to attachment relationships. In three textbooks in the early 1980s (Kopp & Krakow, 1982; Mussen, Conger, Kagan, & Huston, 1984; Clarke-Stewart & Koch, 1983), sections on emotion were very limited, although in some there were chapters on social and emotional development (Mussen et al., 1984; Clarke-Stewart & Koch, 1983). Topics such as attachment, moral development, and aggression dominated the space devoted to social and emotional development. However, in one book of that era (Mussen et al., 1984), three pages on self-control were included. In the late 1980s to early 1990s (Shaffer, 1989; Berk, 1991; Cole & Cole, 1989), sections on social, emotional, and personality development were larger than previously. However, the topic of emotion regulation still usually was not included, aside from the early childhood chapter in the Cole and Cole textbook, which had a three-page subsection on “developing the ability to regulate oneself.” It is only recently that textbooks routinely have included content on emotion regulation. For example, in a sample of three recent textbooks (Shaffer, 2002; Berger, 2003; Siegler, Deloache, & Eisenberg, 2003), all include at least one section on emotion regulation, and all contain chapters or parts of chapters on emotional development.

Despite the relatively recent surge of theory and research on emotion regulation, work on the topic did not emerge from a total theoretical vacuum. For example, Freud (1961/1997) argued that the ego regulates impulses and drives (often involving emotion) that are housed in the id for the purpose of obtaining more pleasure in the long run. Moreover, in Freud’s theory, the emergence of the superego adds a new type of control to that of the ego, based on guilt and the internalization of values and standards of the same-sex parent. Erikson (1950/1963) also discussed the emergence of emotion regulation. In regard to the infant stage of trust versus basic mistrust, he noted, “The [infant’s] experience of a mutual regulation of his increasingly receptive capacities with the maternal techniques of provision gradually helps him to balance the discomfort caused by the immaturity of homeostasis with which he was born” (1950/1963, p. 147). Erikson also discussed the importance of firm, reassuring outer control for structur-

ing and regulating children's early emotion and argued that his second psychosocial stage, autonomy versus shame and doubt, was "decisive for the ration of . . . freedom of self-expression and its suppression" (1950/1963, p. 264). Further, investigators studying coping in the 1960s and 1970s also dealt with the issue of regulation. Haan (1963, 1977), for example, developed elaborate systems of coding ego-related coping behaviors and argued that coping involves "purpose, choice, and flexible shift, adheres to intersubjective reality and logic, and allows and enhances proportionate affective expression" (p. 34). She differentiated coping from ego defenses, which were viewed as more rigid and irrational and as involving covert expression of impulses. Furthermore, Lazarus's (1966) early work on coping, influenced by prior work on stress and cognitive appraisals, pertained to the management of emotion and behavior when an individual is stressed. Indeed, Lazarus and Folkman (1984) defined coping as "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (p. 141). Thus, coping generally is viewed as including attempts to modulate the effects of stressful circumstances (which generally elicit emotion).

It is not clear how much the aforementioned (and other) early lines of work stimulated more recent interest in the construct of emotion regulation. Much of the initial surge of interest in emotion regulation in the 1970s and 1980s was in the area of infancy (see Campos, Barrett, Lamb, Goldsmith, & Stenberg, 1983). For example, Kopp in 1982 outlined stages of emotion-related regulation in the early years of life, especially as exhibited in young children's compliance. Around the same time, Rothbart and Derryberry (1981) cited the regulation of reactivity as one of the two major constructs of temperament, and their conception of temperament came to dominate work on temperament in infants and young children (e.g., Fox, 1989; Rothbart, 1989).

In general, in early studies on regulation or self-control in infancy, regulation was assessed with measures of infants' coping with distress or with obstructions to their desires or movement (e.g., Fox, 1989), infants' reactions during peek-a-boo, separations from mother (e.g., Braungart & Stifter, 1991; Stifter & Moyer, 1991), the still-face situation (Gianino & Tronick, 1988), or measures of temperament (Rothbart, 1981). In early research and theory, self-regulation or self-control after infancy sometimes was operationalized as compliance (especially willing compliance; e.g., Kopp, 1982) or socially appropriate behavior (e.g., not disrupting games or breaking rules; e.g., Block & Block, 1980, in their rating scale; Kendall & Wilcox, 1979). The use of behav-

ioral measures of regulation was less frequent in early studies of children than in studies of infants and toddlers, although research by Mischel (Mischel & Baker, 1972; Mischel & Ebbesen, 1970) and Block and Block (1980) were two notable exceptions. For example, Mischel and his colleagues measured children's abilities to delay gratification (e.g., eating a treat) when doing so would result in receiving a larger amount of the desirable commodity.

In early studies of the correlations of children's emotion-related regulation, there was a tendency for investigators to use the same person—often the parent—to report on children's regulation (often as part of their temperament) and their adjustment or social functioning (Barron & Earls, 1984; Teglasi & MacMahon, 1990). The issue of reporter bias is, consequently, an important limitation to consider when interpreting the results of some early research. Moreover, due to the goals of the researchers at the time of data collection, the construct of emotion regulation sometimes was not differentiated much from emotion: Measures of anger, other negative emotions, or emotional lability, for example, often were viewed as an index of low regulation (Pulkkinen, 1982; Pulkkinen & Hamalainen, 1995; also see Caspi, Henry, McGee, Moffitt, & Silva, 1995). Nonetheless, some of the early work was groundbreaking in that it established links (often over time) between constructs related to or partly reflecting regulation and the quality of children's social functioning (such as their aggression; e.g., Block & Block, 1980; Pulkkinen, 1982). The demonstration of the relevance of regulation to children's adjustment and social competence was, in all likelihood, one of the major factors fueling the sharp increase in interest in regulation in the late 1980s and 1990s.

In the early studies of children's emotion regulation, theoretical models and especially empirical research linking regulation to other domains of children's functioning generally examined simple, direct relations (see Block & Block, 1980; Fox, 1989; Pulkkinen, 1982, 1986, for some exceptions). Typically, correlations between some measure of regulation and an aspect of socioemotional functioning (e.g., compliance, externalizing problems) were examined. Factors that mediated or moderated the relation of regulation to developmental outcomes were seldom examined; nor was regulation likely to be examined as a mediating variable between other variables (e.g., demographic variables or parenting) and children's socioemotional functioning.

Around 1990 and thereafter, there was a dramatic increase in the number of chapters, books, and articles on the topic of children's emotion-related regulation (e.g., Eisenberg & Fabes, 1992; Fox, 1994;

Garber & Dodge, 1991; the special issues of *Developmental Psychology* and *Merrill-Palmer Quarterly*, edited by Dodge [1989] and Eisenberg [1994], respectively). By the mid-1990s, emotion regulation was arguably one of the most popular topics in developmental psychology (Dunn, 1996). Moreover, the central importance of regulation has been widely recognized. For example, a 2000 National Academy of Science (NAS) committee report, *From Neurons to Neighborhoods*, concluded, "The growth of self-regulation is a cornerstone of early childhood development that cuts across all domains of behavior" (Shonkoff & Phillips, 2000, p. 3).

Now

On average, research and theory on emotion regulation has increased in quality as well as quantity in the last decade. On the conceptual front, developmentalists have devoted considerable time and energy to the issues of defining emotion regulation or self-regulation (e.g., Campos, Mumme, Kermoian, & Campos, 1994; Cicchetti, Ganiban, & Barnett, 1991; Cole, Michel, & Teti, 1994; Cole, Martin, & Dennis, in press; Eisenberg, 2002; Kopp & Neufeld, 2003; Thompson, 1994) and to delineating the complex ways in which regulation might be linked to the quality of children's social functioning (e.g., Cole et al., in press; Eisenberg & Fabes, 1992; Eisenberg, Fabes, Guthrie, & Reiser, 2000; Thompson & Calkins, 1996). Although there is still not consensus, issues related to the role of intent, external agents, motivation, physiology, and many other factors in emotion-related regulation are topics of intense discussion. Consider the following definitions of emotion regulation:

extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their intensive and temporal features, to achieve one's goals. (Thompson, 1994, pp. 27–28)

the intra- and extraorganismic factors by which emotional arousal is redirected, controlled, modulated, and modified to enable an individual to function adaptively in emotionally arousing situations. (Cicchetti, Ganiban, & Barnett, 1991, p. 15)

emotion regulation during the early years is a developmental process that represents the deployment of intrinsic and extrinsic processes—at whatever maturity level the young child is at—to (1) manage arousal states for affective biological and

social adaptations and (2) achieve individual goals. (Kopp & Neufeld, 2003, p. 360)

changes associated with activated emotions. These include changes in the emotion itself . . . or in other psychological processes (e.g., memory, social interaction) The term emotion regulation can denote two types of regulatory phenomena: emotion as regulating and as regulated *Emotion as regulating refers to changes that appear to result from the activated emotion Emotion as regulated refers to changes in the activated emotion.* These include changes in emotion valence, intensity or time course . . . and may occur within the individual (e.g., reducing stress through self-soothing) or between individuals (e.g., a child makes an unhappy parent smile). (Cole et al., in press; all italics are theirs)

as the process of initiating, avoiding, inhibiting, maintaining, or modulating the occurrence, form, intensity, or duration of internal feeling states, emotion-related physiological, attentional processes, motivational states, and/or the behavioral concomitants of emotion in the service of accomplishing affect-related biological or social adaptation or achieving individual goals. (Eisenberg & Spinrad, in press)

As is evident from this sampling of definitions, there is agreement that emotion regulation often involves internal processes related to emotion. Some, but not all, investigators appear to believe that the intent often is important (e.g., Eisenberg & Spinrad, in press; Thompson, 1994). Many would likely include regulation imposed or fostered by other people (e.g., parents) as part of emotion-related regulation, if not part of emotion self-regulation. Some include the regulation of behavior that is an external manifestation of emotion (e.g., emotional expressions) or is fueled by emotion (e.g., some acts of aggression) as part of emotion regulation (e.g., Campos et al., 1994; Eisenberg et al., 1996); it is not clear if all investigators would agree on this point. A few researchers (e.g., Gross, 1999) have included behaviors that preclude the actual experience of emotion in their definitions of emotion regulation (or related coping behaviors; see Aspinwall & Taylor, 1997); others do not discuss this possibility. Perhaps of most relevance to our discussion, the centrality of these aspects of functioning to a definition of emotion regulation is a topic of considerable debate (see the special section of *Child Development*, in press, including commentaries to the Cole et al. target article).

In regard to methods, researchers currently tend to use a wide array of measures of emotion regulation and multiple methods (e.g., questionnaires, behavioral measures, physiological measures) and/or multiple reporters (self-reports, parents' reports, teachers' reports). An array of behavioral measures exist for assessing children's self-regulation, even in the second to fifth year of life (e.g., Cole et al., in press; Kochanska, Murray, & Coy, 1997; Kochanska, Murray, & Harlan, 2000; Mangelsdorf, Shapiro, & Marzolf, 1995), as well as in the school years (e.g., Lengua, 2002; Mezzacappa, Kindlon, Saul, & Earls, 1998; Olson, Schilling, & Bates, 1999; White et al., 1994). These measures typically assess the child's abilities to effortfully manage attention, soothe themselves, enlist support, inhibit behavior when needed or on command, or activate behavior as required to behave in the desired or appropriate way. Although these aspects of regulation are not used solely for the regulation of emotion, they are processes that often are part of an effort to modulate emotional experience and expression. In addition, investigators have used vagal tone (Fox, 1989; Porges, Doussard-Roosevelt, & Maiti, 1994) and cortisol responding (Stansbury & Gunnar, 1994) as measures of regulation (or related constructs).

Current research on emotion regulation often involves longitudinal data, which are desirable for assessing various complex ways of conceptualizing the role of regulation in socioemotional development. As was noted by Rothbart and Bates (1998), temperament (including aspects of temperamentally based regulation) may relate to adjustment (or other aspects of development) through direct relations, indirect relations, or moderated relations. As an example of indirect or mediated relations, investigators have found that individual differences in personality resiliency mediate relations of emotion-related regulation to children's social competence (e.g., Eisenberg, Fabes, et al., 2000), agreeableness (Cumberland, Eisenberg, & Reiser, in press), and internalizing problems (Eisenberg, Spinrad, et al., 2004). Moreover, the relations of regulation to adjustment can be mediated by coping (Lengua & Long, 2002). In addition, emotion-related regulation has been found to mediate relations of socialization variables such as attachment (Contreras, Kerns, Weimer, Gentzler, & Tomich, 2000), parental expression of emotion (Eisenberg, Gershoff, et al., 2001; Eisenberg, Valiente, Morris, et al., 2003), parental philosophy of emotion (Gottman, Katz, & Hooven, 1997), nurturant/response, sensitivity, conflicted/harsh parenting (Brody & Ge, 2001; Braungart-Rieker, Garwood, Powers, & Wang, 2001; also see Wills, DuHamel, & Vaccaro, 1995), or parental temperament/personality (Cumberland-Li, Eisen-

berg, Champion, Gershoff, & Fabes, 2003) to social competence, adjustment, and alcohol use. Thus, findings show that emotion-related regulation or related constructs are involved in chains of potentially causal relations.

Further, there are a number of studies demonstrating that various indices of regulation interact with other variables when predicting outcomes such as social competence, adjustment, and substance/alcohol problems. For example, some investigators have found that regulation and negative emotionality interact when predicting children's social competence, coping, or adjustment (e.g., Belsky, Friedman, & Hsieh, 2001; Colder & Stice, 1998; Eisenberg, Fabes, et al., 2000; Lengua & Long, 2002; Valiente et al., 2003; also see Colder & Chassin, 1997; Lengua, Wolchik, Sandler, & West, 2000). In many instances, regulation is a stronger predictor of outcomes for children prone to experience negative emotions than for less emotional children. Moreover, in other studies, self-regulation has moderated the association between multiple risk and adjustment (such that children low in self-regulation were more vulnerable to multiple risk; Lengua, 2002) and between coping and adjustment in children of divorce (Lengua & Sandler, 1996). These studies are representative of the nonlinear relations that have been obtained in a number of recent studies.

Central to many recent studies on emotion-related work have been theory and empirical data on effortful control, an aspect of temperament that is believed to involve executive functioning. *Effortful control* is defined as "the ability to inhibit a dominant response to perform a subdominant response" (Rothbart & Bates, 1998, p. 137) or the "efficiency of executive attention, including the ability to inhibit a dominant response and/or to activate a subdominant response, to plan, and to detect errors" (Rothbart, personal communication, January 26, 2002). Effortful control pertains to the ability to willfully or voluntarily inhibit, activate, or change (modulate) attention and behavior. Measures of effortful control often include indices of attentional regulation (e.g., the ability to voluntarily focus or shift attention as needed, called *attentional control*) and behavioral regulation (e.g., the ability to effortfully inhibit behavior as appropriate, especially when one does not feel like doing so, called *inhibitory control*). Executive skills involved in the integration of information and planning are also involved. There is mounting evidence that effortful control is related to problems with adjustment and social competence (e.g., Eisenberg, Cumberland, et al., 2001; Gilliom, Shaw, Beck, Schonberg, & Lukon, 2002; Kochanska & Knaack, 2003; Lemery, Essex, & Snider, 2002; see Rothbart & Bates, 1998; Eisenberg, Fabes, et al., 2000).

Investigators are also beginning to examine the relations of different aspects of emotion-related regulation (including aspects of effortful control) to various aspects of socioemotional functioning. For example, internalizing problems, because they often involve problems with anxiety (including social anxiety) and depression, likely involve deficits in the ability to modulate internal emotional and emotion-related physiological states. Attentional control—especially the ability to focus on nonthreatening stimuli and to shift attention—may be especially important for minimizing internalizing tendencies (Derryberry & Reed, 2002). Because many individuals with internalizing problems tend to be inhibited, rigid, and inflexible in their behavior, one also might expect them to exhibit high levels of problems with activational control. In contrast, children with externalizing problems, especially those associated with anger and frustration, would be expected to exhibit deficits in attentional control and inhibitory control. There is some initial support for these predictions: Both internalizing children and externalizing children tend to be low in attentional control (e.g., Eisenberg, Cumberland, et al., 2001; Lengua, West, & Sandler, 1998; cf. Lemery et al., 2002), whereas externalizing children also tend to be low to average in inhibitory control (and high in impulsivity; Eisenberg, Cumberland, et al., 2001; Lemery et al., 2002; Lengua et al., 1998). Thus, investigators are beginning to chart relations between different aspects of regulation (including some executive functioning skills related to regulation) and different aspects of children's socioemotional functioning.

Although numerous studies in the past decade have linked problems in emotion-related regulation with adjustment and social competence, it is difficult to prove causality with correlational relations. The increase in longitudinal research on this issue has made it possible at least to examine prediction over time. For example, there is evidence that effortful control and related constructs are related to guilt, social competence, compliance, and adjustment several or even more years in the future (e.g., Eisenberg, Fabes, et al., 2000; Eisenberg, Guthrie, et al., 2000; Kochanska, Tjebkes, & Forman, 1998; Kochanska & Knaack, 2003; Mischel, Shoda, & Peake, 1988; Murphy, Shepard, Eisenberg, & Fabes, in press; Olson et al., 1999; also see Caspi, 2000; Shoda, Mischel, & Peake, 1990). Thus, even if the direction of causality between emotion-related regulation and aspects of socioemotional functioning has not been proved, it is clear that these aspects of functioning are interrelated.

The Future

Definitional Issues

An important goal for the future is to develop greater consensus on the definition of emotion (or emotion-related) regulation. Even though there are numerous commonalities in the definitions used by different theorists and investigators, there are also important differences that lead to problems. Often the results of studies examining emotion regulation cannot be directly compared, in part because the lack of consensus on the definition of emotion regulation results in investigators using quite different measures of the construct. As suggested by Cole, Martin, and Dennis (in press), a common definition of emotion regulation would foster progress in the field and contribute to the validity of emotion regulation as a scientific construct.

There are a number of key distinctions to consider when constructing a definition of emotion regulation. There is general consensus that emotion regulation involves internal processes related to emotion. However, there is not consensus regarding whether emotion regulation involves primarily effortful (i.e., voluntary, albeit not necessarily conscious) processes or also includes involuntary, more reactive processes such as inhibition due to subcortical motivational (e.g., approach or inhibition) systems (see Eisenberg & Morris, 2002; Eisenberg & Spinrad, in press). In addition, as already noted, definitions of emotion regulation vary in regard to (a) their inclusion of processes used to regulate emotion-related behavior such as emotional expression and emotionally driven aggression (rather than only internal emotion-related states) and (b) their inclusion of instances of external regulation (e.g., by parents) of children's emotion-related responding. Even though external regulation of emotion by socializers likely promotes internal regulation, it may be fruitful to differentiate between emotion self-regulation—that is, emotion-relevant regulatory processes that are generated primarily by the target individual—and regulation that is primarily accomplished through the efforts of others (e.g., a parent soothing an infant). Moreover, definitions of emotion regulation differ in regard to their inclusion of proactive coping (“efforts undertaken in advance of a potentially stressful event to prevent it or to modify its form before it occurs”; Aspinwall & Taylor, 1997, p. 417) or antecedent emotion regulation (managing emotional reactions before they occur by using proactive coping or attentional and cognitive processes to choose the situations that are focused upon and how they are interpreted; Gross, 1999). In the future, researchers should strive to

clarify their conceptions of emotion regulation, especially if no consensus on the term is achieved. Unfortunately, investigators often do not define emotion regulation at all, or they include elements of other constructs (e.g., negative emotionality, adjustment, or social competence) in their operationalizations of emotion-related regulation.

Topics of Study

Currently, there is relatively little published longitudinal work on emotion-related regulation's precursors, development, stability, and relations with other emerging processes such as language and an understanding of emotion. For example, although cognition and attention obviously play important roles in emotion regulation, the role of cognitive processes (and their emergence and development) in emotion-related regulation has suffered from benign neglect. Coping theorists have addressed this issue to some degree due to their focus on planning, positive cognitive restructuring, cognitive distraction, and other cognitive coping mechanisms (e.g., Sandler, Tein, & West, 1994; see Compas, Connor-Smith, & Saltzman, 2001). In addition, Mischel and colleagues (e.g., Mischel & Baker, 1972; Mischel & Ebbeson, 1970) examined the role of cognitive transformations and distraction in delay of gratification. Other investigators have included emotion knowledge in interventions that were designed to promote regulated behavior (e.g., Greenberg, Kusche, Cook, & Quamma, 1995; see Denham & Burton, in press). Dodge and Crick's (Crick & Dodge, 1994) work on processes involved in aggression also is of some relevance; their conceptual model includes the role of cognitive processes such as attributions about others and generating and prioritizing strategies for dealing with potential social conflicts in aggression (often a dysregulated behavior). However, we know relatively little about the role of children's understanding of their own (as well as others') feeling states in self-regulation when emotionally aroused, how the need to regulate is internally calculated, how regulation strategies are weighed and selected, and how cognitive processes are harnessed to modulate attention and effortfully activate or inhibit behavior.

Physiological correlates of effortful control and less voluntary reactive processes also are of considerable interest, but they seldom have been studied. It is likely, for example, that effortful control and reactive processes are most closely associated with different parts of the brain (see Derryberry & Reed, 1996; Eisenberg & Morris, 2002). Moreover, vagal modulation of respiratory-driven, high-frequency heart-rate variability has been associated with executive control (i.e., effortful control) on behavioral tasks, whereas motivational or reactive processes involved in

reactive control (e.g., passive avoidance, avoidance of punishment and low reward dominance) have been correlated with sympathetic modulation of heart-rate variability (Mezzacappa et al., 1998).

Moreover, although children's emotion-related regulation has been a popular topic of study in recent years, most investigators have focused primarily on parental socialization, such as parenting style, parental expression, acceptance, and discussion of emotion, and parental reactions to children's expression of emotion (see Eisenberg, Cumberland, & Spinrad, 1998; Eisenberg, Spinrad, & Cumberland, 1998; Gottman et al., 1997). Socialization influences on emotion-relevant regulation in day care, kindergarten, and elementary school, as well as in other contexts external to the home, seldom have been studied. These potential sources of influence likely play an important role in the socialization of regulation, especially for older children. Moreover, research on this issue is of practical significance for education.

Culture has been a growing topic of interest in the field of psychology in recent years. Unfortunately, most studies on emotion regulation have been conducted in Western cultures, especially in North America, and clearly a need exists for studies in different cultures and subcultures. In such research, it would be useful to explore issues such as the following: similarities and differences across cultures in conceptions of regulated behavior, when regulation is desirable, and how it is achieved; the applicability of measures of emotion-related regulation across cultures and how they can be adapted to be culturally sensitive and valid; cultural differences in commonly enacted regulation styles and strategies; and cultural differences in the relations between regulation and other psychological variables, such as parenting socialization, social competence, and psychological adjustment. Although cross-cultural studies can contribute greatly to our understanding of the role of context in conceptions and instantiations of emotion-related regulation, within-culture studies in non-Western societies or subcultures in Western societies examining the correlates or predictors of individual differences in emotion regulation can also be informative (see Eisenberg, Pidada, & Liew, 2001; Zhou, Eisenberg, Wang, & Reiser, in press, for examples of studies conducted in Indonesia and China, respectively).

In addition, although there is behavioral genetics research on processes or dispositions involved in infants' and toddlers' emotion regulation (e.g., attention focusing, inhibitory control; Goldsmith, Buss, & Lemery, 1997), there is relatively little analogous work in older children, especially involving both questionnaire and behavioral indices. Studies in which age-related change in the contributions of genetic and

environmental factors to regulation are examined are an example of behavioral genetics research that would be especially informative (see Plomin et al., 1993).

Measurement Challenges

Several challenges in regard to the measurement of emotion-related regulation are evident (see Cole et al., in press). First, there is a need for purer measures of emotion regulation. Some measures of emotion regulation likely measure emotion, social competence, or adjustment as much (or more) than regulation. Moreover, measures of regulation often may inadvertently tap relatively involuntary behavioral inhibition due to children's inhibition in novel situations; others may assess a combination of effortful control and impulsivity (i.e., the relatively involuntary pull toward a reward such as food). Inhibition tasks that assess children's behavioral inhibition when confronted with novel objects or people might be used in combination with effortful control to assess the unique relations of both constructs. Moreover, although voluntary attention focusing has been frequently studied, aspects of attention focusing that are involuntary (e.g., rumination) have less frequently been examined in children. Information on these processes might help investigators to differentiate between effortful attentional processes and more involuntary attentional responses (see, e.g., Derryberry & Reed, 2002; Vasey El-Hag, & Daleiden, 1996).

As was suggested by Cole, Martin, and Dennis (in press), researchers should strive, when possible, to use independent measurements for the activated emotion and the regulatory process. Because emotion regulation often is inferred from the expression of low levels of emotion, measures of emotion regulation and emotionality often are confounded. This is one reason that it is useful to assess processes that often are involved in emotion-related regulation (e.g., attentional control, inhibition of behavior) rather than trying to assess the regulation of the emotion itself. One approach that Cole et al. (in press) suggested for separating emotion regulation from emotion is to analyze temporal relations between emotions and regulatory processes (e.g., behaviors such as self-comforting or distracting oneself).

In addition, there is a need for new measures tapping neglected aspects of emotion regulation such as antecedent emotion regulation or proactive coping (see above). Most researchers have focused on regulation processes that occur during the elicitation of emotion or its physiological concomitants (and related action tendencies) or after an emotion is presumed to have been elicited. One reason for the lack of research on antecedent types of regulation is that they are difficult to

observe and measure. Perhaps some aspects of antecedent regulation or proactive coping could be assessed by measuring attentional and cognitive processes (and perhaps physiological reactions) that proceed (or portend) potentially stressful events. For example, one could assess attempts to avoid allocating attention to cues regarding threatening events using Stroop-like and other attentional tasks (see Derryberry & Reed, 2002). One might also try to assess (e.g., with interviews or thought-reporting procedures) children's attempts to plan ahead in order to prevent or minimize exposure to stressful or negative circumstances (or maximize positive emotion; Eisenberg, Morris, & Spinrad, in press). Similar procedures could be used to assess cognitive activities that adjust or alter goals when doing so is likely to reduce distress. Investigators might also construct situations in which they can observe behavioral instances of avoiding or modifying potentially evocative contexts (before they become distressing).

Further investigation of the relative effectiveness of different regulatory strategies/processes for modulating different specific emotions (e.g., anger, sadness, fear) would also contribute to an understanding of emotion-related regulation. Such information has theoretical and applied implications. For example, when considering intervention studies or clinical work, after determining the negative emotion(s) to which an individual or a population is most prone, adequate behavioral or cognitive strategies could be fostered. Beck's (e.g., Beck & Freeman, 1990) and others' work on the cognitive control of depression represents attempts to use cognitive strategies to regulate thoughts linked with certain emotional experiences. Similarly, information on the regulatory behaviors associated with specific emotions could be useful in prevention and intervention programs with children.

Finally, many studies of older children's and adolescents' emotion-related regulation have involved solely self-report questionnaires because it is difficult to elicit sufficient emotion to observe adolescents' emotion regulation. The use of other-report measures is a partial remedy (e.g., Lengua et al., 1998), but more studies involving behavioral measures of adolescents' emotion-related regulation (e.g., White et al., 1994) are needed.

Design Issues

Most studies on emotion-related regulation involve correlational, often concurrent, data so inferences in regard to causality are unwarranted. Sometimes longitudinal methods have been used, especially to

study the relation of children's emotion-related regulation at one age to their psychological adjustment, such as internalizing problems, externalizing problems, and social competence at an older age. However, due to their expense and the problem of attrition, most longitudinal studies of regulation span only a few years. In addition, although the causal relation of earlier regulation to later psychological outcomes cannot be clearly demonstrated from longitudinal correlational data, certain analytic procedures can provide evidence regarding the plausibility of particular causal sequences. For example, an investigator can take into account prior levels of variables when examining relations among variables at a later assessment in order to assess if relations between regulation and other variables seem to be due simply to earlier levels of those variables (and their possible interrelations at a younger age; Eisenberg, Valiente, Fabes, et al., 2003). When there are relations of regulation to social functioning even when controlling for levels of functioning at the time regulation was assessed (or taking into account consistency in measures over time in structural equation models), then there is more reason to believe that regulation has a causal effect on social functioning (e.g., Eisenberg, Spinrad, et al., 2004). In addition, in structural equation modeling, one can test the plausibility of bidirectional relations over time or if a path from emotion-related regulation to an aspect of socioemotional functioning occurring later in time is stronger or more unique than a path from such functioning to emotion-related regulation at the later assessment (see Eisenberg, Spinrad, et al., 2004 for an example). In the future, the field would benefit from greater use of studies involving the assessment of at least two points and the use of sophisticated statistical tools such as structural equation modeling. A related statistical tool that could be used to greater advantage is growth curve analysis, which can help identify different developmental trajectories for emotion regulation and relations among the developmental trajectories of regulation and other aspects of socioemotional functioning.

However, even correlational longitudinal data cannot prove causality. Experimental intervention or prevention studies that train children to be more regulated and then test their social competence and adjustment are the best way to unravel causal relations and test theoretical propositions (e.g., Greenberg et al., 1995).

The intervention work by people such as Greenberg (Greenberg et al., 1995; Kam, Greenberg, & Walls, 2003) and others using his Promoting Alternative Thinking Strategies curriculum (see Conduct Problems Prevention Research Group, 1999a, 1999b) is an example of programs in which teaching regulation is part of an intervention.

However, in general, interventions of this sort have included so many components that it is impossible to know which aspects of the intervention were responsible for changes in regulation or related social behaviors (e.g., changes in aggression). In the future, it would be useful to examine the effects of interventions specifically and primarily targeted at promoting regulation (not in combination with other interventions) on children's regulation and related social behaviors.

Conclusion

In summary, the topic of emotion regulation has moved to center stage in developmental psychology in recent years. Building on early pioneers in the field, we have made considerable progress in understanding this crucial aspect of development. Nonetheless, many challenges related to defining, measuring, and understanding emotion-related regulation and its associations with other aspects of development remain. If investigators address these challenges, we are likely to see further significant strides in our understanding of emotion regulation in coming decades.

References

- ASPINWALL, L. G., & TAYLOR, S. E. (1997). A stitch in time: Self-regulation and proactive coping. *Psychological Bulletin*, *121*, 417–436.
- BARRON, A. P., & EARLS, F. (1984). The relation of temperament and social factors to behavior problems in three-year-old children. *Journal of Child Psychology and Psychiatry*, *25*, 23–33.
- BAUMEISTER, R. F., & VOHS, K. D. (Eds.) (2004). *Handbook of self-regulation: Research, theory, and applications*. New York: Guilford.
- BECK, A. T., & FREEMAN, A. (1990). *Cognitive theory of personality disorders*. New York: Guilford.
- BELSKY, J., FRIEDMAN, S. L., & HSIEH, K. H. (2001). Testing a core emotion-regulation prediction: Does early attentional persistence moderate the effect of infant negative emotionality on later development? *Child Development*, *72*, 123–133.
- BERGER, K. S. (2003). *The developing person through childhood to adolescence*. New York: Worth.
- BERK, L. E. (1991). *Child Development* (2nd ed.). New York: Allyn and Bacon.
- BLOCK, J. H., & BLOCK, J. (1980). The role of ego-control and ego-resiliency in the organization of behavior. In W. A. Collins (Ed.), *The Minnesota Symposia on Child Psychology: Vol. 13. Development of cognition, affect, and social relations* (pp. 39–101). Hillsdale, NJ: Erlbaum.
- BRAUNGART, J. M., & STIFTER, C. A. (1991). Regulation of negative reactivity during the strange situation: Temperament and attachment in 12-month-old infants. *Infant Behavior and Development*, *14*, 349–364.

- BRAUNGART-RIEKER, J., GARWOOD, M. M., POWERS, B. P., & WANG, X. (2001). Parental sensitivity, infant affect, and affect regulation: Predictors of later attachment. *Child Development, 72*, 252–270.
- BRODY, G. H., & GE, X. (2001). Linking parenting processes and self-regulation to psychological functioning and alcohol use during early adolescence. *Journal of Family Psychology, 15*, 82–94.
- CAMPOS, J. J., BARRETT, K. C., LAMB, M. E., GOLDSMITH, H. H., & STENBERG, C. (1983). Socioemotional development. In P. H. Mussen (Ed.), *Handbook of Child Psychology* (4th ed., pp. 783–915). New York: Wiley.
- CAMPOS, J. J., MUMME, D. L., KERMOIAN, R., & CAMPOS, R. G. (1994). A functionalist perspective on the nature of emotion. In N. A. Fox (Ed.), *The development of emotion regulation: Biological and behavioral considerations. Monographs of the Society for Research in Child Development, 59*, 284–303.
- CASPI, A. (2000). The child is the father of the man: Personality continuities from childhood to adulthood. *Journal of Personality and Social Psychology, 78*, 158–172.
- CASPI, A., HENRY, B., MCGEE, R. O., MOFFITT, T. E., & SILVA, P. A. (1995). Temperamental origins of child and adolescent behavior problems: From age three to age fifteen. *Child Development, 66*, 55–68.
- CICCHETTI, D., GANIBAN, J., & BARNETT, D. (1991). Contributions from the study of high risk populations to understanding the development of emotion regulation. In K. Dodge & J. Garber (Eds.), *The development of emotion regulation* (pp. 15–48). New York: Cambridge University Press.
- CLARKE-STEWART, A., & KOCH, J. B. (1983). *Children development through adolescence*. New York: Wiley.
- COLDER, C. R., & CHASSIN, L. (1997). Affectivity and impulsivity: Temperament risk for adolescent alcohol involvement. *Psychology of Addictive Behaviors, 11*, 83–97.
- COLDER, C. R., & STICE, E. (1998). The moderating effect of impulsivity on the relationship between anger and adolescent problem behavior: Cross-sectional and prospective findings. *Journal of Youth and Adolescence, 27*, 255–274.
- COLE, M., & COLE, S. R. (1989). *The development of children*. New York: Scientific American Books.
- COLE, P. M., MARTIN, S. E., & DENNIS, T. A. (in press). Emotion regulation as a scientific construct: Methodological challenges and directions for child development research. *Child Development*.
- COLE, P. M., MICHEL, M. K., & TETI, L. O. (1994). The development of emotion regulation and dysregulation: A clinical perspective. *Monographs of the Society for Research in Child Development, 59* (Serial No. 240), 73–100.
- COMPAS, B. E., CONNOR-SMITH, J. K., & SALTZMAN, H. (2001). Coping with stress during childhood and adolescence: Problems, progress, and potential in theory and research. *Psychological Bulletin, 127*, 87–127.

- CONDUCT PROBLEMS PREVENTION RESEARCH GROUP. (1999a). Initial impact of the Fast Track Prevention Trial for conduct problems: I. The high-risk sample. *Journal of Consulting and Clinical Psychology, 67*, 619–647.
- CONDUCT PROBLEMS PREVENTION RESEARCH GROUP. (1999b). Initial impact of the Fast Track Prevention Trial for conduct problems: II. Classroom effects. *Journal of Consulting and Clinical Psychology, 67*, 648–657.
- CONTRERAS, J., KERNS, K. A., WEIMER, B. L., GENTZLER, A. L., & TOMICH, P. L. (2000). Emotion regulation as a mediator of associations between mother-child attachment and peer relationships in middle childhood. *Journal of Family Psychology, 14*, 111–124.
- CRICK, N. R., & DODGE, K. A. (1994). A review and reformulation of social information-processing mechanisms in children's social adjustment. *Psychological Bulletin, 115*, 74–101.
- CUMBERLAND-LI, A., EISENBERG, N., CHAMPION, C., GERSHOFF, E. T., & FABES, R. A. (2003). The relation of parental emotionality and related dispositional traits to parental expression of emotion and children's social functioning. *Motivation and Emotion, 2*, 27–56.
- CUMBERLAND, A., EISENBERG, N., & REISER, M. (in press). Relations of young children's agreeableness and resiliency to effortful control, impulsivity, and social competence. *Social Development*.
- DENHAM, S., & BURTON, R. (in press). *Social and emotional prevention and intervention programming for preschoolers*. New York: Kluwer-Plenum.
- DERRYBERRY, D., & REED, M. A. (1996). Regulatory processes and the development of cognitive representations. *Development and Psychopathology, 8*, 215–234.
- DERRYBERRY, D., & REED, M. (2002). Anxiety-related attentional biases and their regulation by attentional control. *Journal of Abnormal Psychology, 111*, 225–236.
- DEVELOPMENTAL PSYCHOLOGY TODAY. (1975). New York: Random House.
- DODGE, K. A. (1989). Coordinating responses to aversive stimuli: Introduction to a special section on the development of emotion regulation. *Developmental Psychology, 25*, 339–342.
- DUNN, J. (1996). The Emanuel Miller Memorial Lecture 1995: Children's relationships: Bridging the divide between cognitive and social development. *Journal of Child Psychology and Psychiatry and Allied Disciplines, 37*, 507–518.
- EISENBERG, N. (1994). Guest editor for a special issue of *Merrill-Palmer Quarterly*: Children's emotions and social competence. *Merrill-Palmer Quarterly, 40*, 1–169.
- EISENBERG, N. (2002). Emotion-related regulation and its relation to quality of social functioning. In W. W. Hartup & R. A. Weinberg, *The Minnesota*

- Symposia of Child Psychology: Vol. 32. Child psychology in retrospect and prospect* (pp. 133–171). Mahwah, NJ: Erlbaum.
- EISENBERG, N., CUMBERLAND, A., & SPINRAD, T. L. (1998). Parental socialization of emotion. *Psychological Inquiry, 9*, 241–273.
- EISENBERG, N., CUMBERLAND, A., SPINRAD, T. L., FABES, R. A., SHEPARD, S. A., REISER, M., MURPHY, B. C., LOSOYA, S. H., & GUTHRIE, I. K. (2001). The relations of regulation and emotionality to children's externalizing and internalizing problem behavior. *Child Development, 72*, 1112–1134.
- EISENBERG, N., & FABES, R. A. (Eds.). (1992). Emotion and its regulation in early and development. *New Directions in Child Development, 55*, 1–110.
- EISENBERG, N., FABES, R. A., GUTHRIE, I., MURPHY, B. C., MASZK, P., HOLMGREN, R., & SUH, K. (1996). The relations of regulation and emotionality to problem behavior in elementary school children. *Development and Psychopathology, 8*, 141–162.
- EISENBERG, N., FABES, R. A., GUTHRIE, I. K., & REISER, M. (2000). Dispositional emotionality and regulation: Their role in predicting quality of social functioning. *Journal of Personality and Social Psychology, 78*, 136–157.
- EISENBERG, N., GERSHOFF, E. T., FABES, R. A., SHEPARD, S. A., CUMBERLAND, A. J., LOSOSYA, S. H., GUTHRIE, I. K., & MURPHY, B. C. (2001). Mothers' emotional expressivity and children's behavior problems and social competence: Mediation through children's regulation. *Developmental Psychology, 37*, 475–490.
- EISENBERG, N., GUTHRIE, I. K., FABES, R. A., SHEPARD, S., LOSOYA, S., MURPHY, B. C., JONES, S., POULIN, R., & REISER, M. (2000). Prediction of elementary school children's externalizing problem behaviors from attentional and behavioral regulation and negative emotionality. *Child Development, 71*, 1367–1382.
- EISENBERG, N., & MORRIS, A. S. (2002). Children's emotion-related regulation. In R. Kail (Ed.), *Advances in child development and behavior* (Vol. 30, pp. 190–229). Amsterdam: Academic Press.
- EISENBERG, N., MORRIS, A. S., & SPINRAD, T. L. (in press). Emotion-related regulation: The construct and its measurement. In D. Teti (Ed.), *Handbook of research methods in developmental psychology*. Oxford: Blackwell.
- EISENBERG, N., PIDADA, S., & LIEW, J. (2001). The relations of regulation and negative emotionality to Indonesian children's social functioning. *Child Development, 72*, 1747–1763.
- EISENBERG, N., & SPINRAD, T. L. (in press). Emotion-related regulation: Sharpening the definition. *Child Development*.
- EISENBERG, N., SPINRAD, T. L., & CUMBERLAND, A. (1998). Socialization of emotion: Reply to reviewers. *Psychological Inquiry, 9*, 317–333.
- EISENBERG, N., SPINRAD, T. L., FABES, R. A., REISER, M., CUMBERLAND, A., SHEPARD, S. A., VALIENTE, C., LOSOYA, S. L., GUTHRIE, I. K., & THOMPSON, M. (2004). The relations of effortful

- control and impulsivity to children's resiliency and adjustment. *Child Development*.
- EISENBERG, N., VALIENTE, C., FABES, R. A., SMITH, C. L., REISER, M., SHEPARD, S. A., LOSOYA, S. H., GUTHRIE, I. K., MURPHY, B. C., & CUMBERLAND, A. J. (2003). The relations of effortful control and ego control to children's resiliency and social functioning. *Developmental Psychology*, 39, 761–776.
- EISENBERG, N., VALIENTE, C., MORRIS, A. S., FABES, R. A., CUMBERLAND, A., REISER, M., GERSHOFF, E. T., SHEPARD, S. A., & LOSOYA, S. (2003). Longitudinal relations among parental emotional expressivity, children's regulation, and quality of socioemotional functioning. *Developmental Psychology*, 39, 2–19.
- ERIKSON, E. H. (1963). *Childhood and society*. New York: Norton. (Original work published 1950.)
- FOX, N. A. (Ed.). Emotion regulation: Behavioral and biological considerations. *Monographs of the Society for Research in Child Development*, 59 (Serial No. 240), 167–186.
- FOX, N. A. (1989). Psycho physiological correlates of emotional reactivity during the first year of life. *Developmental Psychology*, 25, 364–372.
- FOX, N. A. (Ed.). (1994). The development of emotion regulation: Biological and behavioral considerations. *Monographs of the Society for Research in Child Development*, 59 (2–3, Serial No. 240).
- FREUD, S. (1997). Beyond the pleasure principle. In *Sigmund Freud: Selected writings* (pp. 235–310). New York: Norton. (Reprinted from *Civilization and its discontents*, [J. Strachey, Trans., 1961]).
- GARBER, J., DODGE, K. A. (Eds.). (1991). *The development of emotion regulation and dysregulation*. Cambridge, UK: Cambridge University Press.
- GARDNER, H. (1978). *Developmental Psychology: An introduction*. Boston: Little, Brown.
- GIANINO, A., TRONICK, E. Z. (1988). The mutual regulation model: The infant's self and interactive regulation, coping, and defense. In T. Field, P. McCabe, & N. Schneiderman (Ed.), *Stress and coping* (pp. 47–68). Hillsdale, NJ: Erlbaum.
- GILLIOM, M., SHAW, D. S., BECK, J. E., SCHONBERG, M. A., & LUKON, J. L. (2002). Anger regulation in disadvantaged preschool boys: Strategies, antecedents, and the development of self-control. *Developmental Psychology*, 38, 222–235.
- GOLDSMITH, H. H., BUSS, K. A., & LEMERY, K. S. (1997). Toddler and childhood temperament: Expanded content, stronger genetic evidence, new evidence for the importance of environment. *Developmental Psychology*, 33, 891–905.
- GOTTMAN, J. M., KATZ, L. F., HOOVEN, C. (1997). *Meta-emotion: How families communicate emotionally*. Mahwah, NJ: Erlbaum.
- GREENBERG, M. T., KUSCHE, C. A., COOK, E. T., QUAMMA, J. P. (1995). Promoting emotional competence in school-aged children: The effects of the PATHS curriculum. *Development and Psychopathology*, 7, 117–136.

- GROSS, J. J. (1999). Emotion and emotion regulation. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research* (2nd ed.; pp. 525–552). New York: Guilford.
- HAAN, N. (1963). An investigation of the relationship of Rorschach scores, patterns, and behavior to coping and defense mechanisms. *Journal of Projective Techniques*, 28, 429–441.
- HAAN, N. (1977). *Coping and defending: Processes of self-environment organization*. New York: Academic Press.
- KAM, C-M., GREENBERG, M. T., & WALLS, C. T. (2003). Examining the role of implementation quality in school-based prevention using the PATHS curriculum. *Prevention Science*, 4, 55–63.
- KENDALL, P. C., & WILCOX, L. E. (1979). Self-control in children: The development of a rating scale. *Journal of Consulting and Clinical Psychology*, 47, 1020–1030.
- KOCHANSKA, G., & KNAACK, A. (2003). Effortful control as a personality characteristic of young children: Antecedents, correlates, and consequences. *Journal of Personality* 71, 1087–1112.
- KOCHANSKA, G., MURRAY, K., & COY, K. (1997). Inhibitory control as a contributor to conscience in childhood: From toddler to early school age. *Child Development*, 68, 263–277.
- KOCHANSKA, G., MURRAY, K. L., & HARLAN, E. T. (2000). Effortful control in early childhood: Continuity and change, antecedents, and implications for social development. *Developmental Psychology*, 36, 220–232.
- KOCHANSKA, G., TJEKES, T. L., & FORMAN, D. R. (1998). Children's emerging regulation of conduct: Restraint, compliance, and internalization from infancy to the second year. *Child Development*, 69, 1378–1389.
- KOPP, C. B. (1982). Antecedents of self-regulation: A developmental perspective. *Development Psychology*, 18, 199–214.
- KOPP, C. B., & KRAKOW, J. B. (1982). *The child: Development in a social context*. Reading, MA: Addison-Wesley.
- KOPP, C. B., & NEUFIELD, S. J. (2003). Emotional development during infancy. In R. Davidson, K. R. Scherer, & H. H. Goldsmith (Eds.), *Handbook of Affective Sciences* (pp. 347–374). Oxford, UK: Oxford University Press.
- LAZARUS, R. (1966). *Psychological stress and the coping process*. New York: McGraw-Hill.
- LAZARUS, R. S., & FOLKMAN, S. (1984). *Stress, appraisal, and coping* (pp. 282–325). New York: Springer.
- LEMERY, K. S., ESSEX, M. J., & SNIDER, N. A. (2002). Revealing the relation between temperament and behavior problem symptoms by eliminating measurement confounding: Expert ratings and factor analyses. *Child Development*, 73, 867–882.
- LENGUA, L. J. (2002). The contribution of emotionality and self-regulation to the understanding of children's response to multiple risk. *Child Development*, 73, 144–161.

- LENGUA, L. J., & LONG, A. C. (2002). The role of emotionality and self-regulation in the appraisal-coping process: Tests of direct and moderating effects. *Journal of Applied Developmental Psychology, 23*, 471–493.
- LENGUA, L. J., & SANDLER, I. N. (1996). Self-regulation as a moderator of the relation between coping and symptomatology in children of divorce. *Journal of Abnormal Child Psychology, 24*, 681–701.
- LENGUA, L. J., WEST, S. G., & SANDLER, I. N. (1998). Temperament as a predictor of symptomatology in children: Addressing contamination of measures. *Child Development, 69*, 164–181.
- LENGUA, L. J., WOLCHIK, S. A., SANDLER, I. N., & WEST, S. G. (2000). The additive and interactive effects of parenting and temperament in predicting problems of children of divorce. *Journal of Clinical Child Psychology, 29*, 232–244.
- MANGELSDORF, S. C., SHAPIRO, J. R., & MARZOLF, D. (1995). Developmental and temperamental differences in emotion regulation in infancy. *Child Development, 66*, 1817–1828.
- MEZZACAPPA, E., KINDLON, D., SAUL, J. P., & EARLS, F. (1998). Executive and motivational control of performance task behavior, and autonomic heart-rate regulation in children: Physiological validation of two-factor solution inhibitory control. *Journal of Child Psychology and Psychiatry, 39*, 525–531.
- MISCHEL, W., & BAKER, N. (1972). Cognitive appraisals and transformations in delay behavior. *Journal of Personality and Social Psychology, 31*, 254–261.
- MISCHEL, W., & EBBESEN, E. B. (1970). Attention in delay of gratification. *Journal of Personality and Social Psychology, 16*, 329–337.
- MISCHEL, W., SHODA, Y., & PEAKE, P. K. (1988). The nature of adolescent competencies predicted by preschool delay of gratification. *Journal of Personality and Social Psychology, 54*, 687–696.
- MURPHY, B. C., SHEPARD, S. A., EISENBERG, N., & FABES, R. A. (in press). Concurrent and across time prediction of young adolescents' social functioning: The role of emotionality and regulation. *Social Development*.
- MUSSEN, P. H., CONGER, J. J., KAGAN, J., & HUSTON, A. C. (1984). *Child development and personality*. New York: Harper & Row.
- OLSON, S. L., SCHILLING, E. M., & BATES, J. E. (1999). Measurement of impulsivity: Construct coherence, longitudinal stability, and relationship with externalizing problems in middle childhood and adolescence. *Journal of Abnormal Child Psychology, 27*, 151–165.
- PHILIPPOT, P. & FELDMAN, R. S. (Eds.). (in press). *The regulation of emotion*. Mahwah, NJ: Erlbaum.
- PLOMIN, R., EMDE, R. N., BRAUNGART, J. M., CAMPOS, J., KAGAN, J., REZNICK, J. S., ROBINSON, J., ZAHN-WAXLER, C., & DEFRIES, J. C. (1993). Genetic change and continuity from fourteen to twenty months: The MacArthur Longitudinal Twin Study. *Child Development, 64*, 1354–1376.

- PORGES, S. W., DOUSSARD-ROOSEVELT, J. A., & MAITI, A. K. (1994). Vagal tone and the physiological regulation of emotion. In N. A. Fox (Ed.), *Emotion regulation: Behavioral and biological considerations. Monographs of the Society for Research in Child Development*, 59 (Serial No. 240), 167–186.
- PULKKINEN, L. (1982). Self-control and continuity from childhood to late adolescence. In P. B. Baltes & O. Brim, Jr. (Eds.), *Life-span development and behavior* (Vol. 4., pp. 63–105). New York: Academic Press.
- PULKKINEN, L. (1986). The role of impulse control in the development of antisocial and prosocial behavior. In D. Olweus, J. Block, & M. Radke-Yarrow (Eds.), *Development of antisocial and prosocial behavior: Research, theories, and issues* (pp. 149–206). Orlando: Academic Press.
- PULKKINEN, L., & HAMALAINEN, M. (1995). Low self-control as a precursor to crime and accidents in a Finnish longitudinal study. *Criminal Behaviour and Mental Health*, 5, 424–438.
- ROTHBART, M. K. (1981). Measurement of temperament in infancy. *Child Development*, 52, 569–578.
- ROTHBART, M. K. (1989). Temperament and development. In G. A. Kohnstamm, J. E. Bates, & M. K. Rothbart (Eds.), *Temperament in childhood* (pp. 187–247). New York: Wiley.
- ROTHBART, M. K., & BATES, J. E. (1998). Temperament. In W. Damon (Series Ed.) and N. Eisenberg (Vol. Ed.), *Handbook of child psychology: Vol. 3. Social, emotional, personality development* (pp. 105–176). New York: Wiley.
- ROTHBART, M. K., & DERRYBERRY, D. (1981). Development of individual differences in temperament. In M. E. Lamb & A. L. Brown (Eds.), *Advances in developmental psychology* (Vol. 1, pp. 37–86). Hillsdale, NJ: Erlbaum.
- SANDLER, I. N., TEIN, J., & WEST, S. G. (1994). Coping, stress and the psychological symptoms of children of divorce: A cross-sectional and longitudinal study. *Child Development*, 65, 1744–1763.
- SHAFFER, D. R. (1989). *Developmental psychology: Childhood and adolescence* (2nd ed.). Belmont, CA: Brooks/Cole.
- SHAFFER, D. R. (2002). *Developmental psychology: Childhood and adolescence* (6th ed.). Belmont, CA: Wadsworth.
- SHONKOFF, J. P., & PHILLIPS, D. A. (Eds.), & THE COMMITTEE ON INTEGRATING THE SCIENCE OF EARLY CHILDHOOD DEVELOPMENT. (2000). *From neurons to neighborhoods: The science of early childhood development*. Washington DC: National Academy of Science.
- SHODA, Y., MISCHEL, W., & PEAKE, P. K. (1990). Predicting adolescent cognitive and self-regulatory competencies from preschool delay of gratification: Identifying diagnostic conditions. *Developmental Psychology*, 26, 978–986.
- SIEGLER, R., DELOACHE, J., & EISENBERG, N. (2003). *How children develop*. New York: Worth.

- SOCIETY FOR RESEARCH IN CHILD DEVELOPMENT. (1981, April). *Program book*. Biennial Meeting, Boston, MA.
- SOCIETY FOR RESEARCH IN CHILD DEVELOPMENT. (1989, April). *Abstracts* (Vol. 6). Biennial Meeting, Kansas City, MO.
- SOCIETY FOR RESEARCH IN CHILD DEVELOPMENT. (2003, April). *Program book*. Biennial Meeting, Tampa, FL.
- STIFTER, C. A., & MOYER, A. (1991). The regulation of positive affect: Gaze aversion activity during mother-infant interaction. *Infant Behavior and Development, 14*, 111–123.
- STANSBURY, K., & GUNNAR, M. R. (1994). Adrenocortical activity and emotion regulation. In N. A. Fox (Ed.), *The development of emotion regulation: Biological and behavioral considerations. Monographs of the Society for Research in Child Development, 59* (Serial No. 240), 108–134.
- TEGLASI, H., & MACMAHON, B. H. (1990). Temperament and common problem behaviors of children. *Journal of Applied Developmental Psychology, 11*, 331–349.
- THOMPSON, R. A. (1994). Emotion regulation: A theme in search of definition. In N. A. Fox (Ed.), *The development of emotion regulation: Biological and behavioral considerations. Monographs of the Society for Research in Child Development, 59* (2–3, Serial No. 240), 25–52.
- THOMPSON, R. A., & CALKINS, S. D. (1996). The double-edged sword: Emotional regulation for children at risk. *Development and Psychopathology, 8*, 163–182.
- VALIENTE, C., EISENBERG, N., SMITH, C. L., REISER, M., FABES, R. A., LOSOYA, S., GUTHRIE, I. K., & MURPHY, B. C. (2003). The relations of effortful control and reactive control to children's externalizing problems: A longitudinal assessment. *Journal of Personality, 71*, 1179–1205.
- VASEY, M. W., EL-HAG, N., & DALEIDEN, E. L. (1996). Anxiety and the processing of emotionally threatening stimuli: Distinctive patterns of selective attention among high- and low-test-anxious children. *Child Development, 67*, 1173–1185.
- WHITE, J. L., MOFFITT, T. E., CASPI, A., BARTUSCH, D. J., NEEDLES, D. J., & STOUTHAMER-LOEBER, M. (1994). Measuring impulsivity and examining its relationship to delinquency. *Journal of Abnormal Psychology, 103*, 192–205.
- WILLS, T. A., DUHAMEL, K., & VACCARO, D. (1995). Activity and mood temperament as predictors of adolescent substance use: Test of a self-regulation mediational model. *Journal of Personality and Social Psychology, 68*, 901–916.
- ZHOU, Q., EISENBERG, N., WANG, Y., & REISER, M. (in press). Chinese children's effortful control and dispositional anger/frustration: Relations to parenting styles and children's social functioning. *Developmental Psychology*.