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Emotion processes in normal and abnormal development and preventive intervention

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Abstract

We present an analysis of the role of emotions in normal and abnormal development and preventive intervention. The conceptual framework stems from three tenets of differential emotions theory (DET). These principles concern the constructs of emotion utilization; intersystem connections among modular emotion systems, cognition, and action; and the organizational and motivational functions of discrete emotions. Particular emotions and patterns of emotions function differentially in different periods of development and in influencing the cognition and behavior associated with different forms of psychopathology. Established prevention programs have not emphasized the concept of emotion as motivation. It is even more critical that they have generally neglected the idea of modulating emotions, not simply to achieve self-regulation, but also to utilize their inherently adaptive functions as a means of facilitating the development of social competence and preventing psychopathology. The paper includes a brief description of a theory-based prevention program and suggestions for complementary targeted interventions to address specific externalizing and internalizing problems. In the final section, we describe ways in which emotion-centered preventions can provide excellent opportunities for research on the development of normal and abnormal behavior.

This paper concerns the functions of emotions in development and in the prevention of behavior problems and psychopathology. Emotions directly affect what we perceive, how much sensory data we need to perceive it, how fast we perceive it, and what we think and do in response (Crick & Dodge, 1994; Izard, Wehmer, Livsey, & Jennings, 1965; Niedenthal, Setterlund, & Jones, 1994; Rogosch, Cicchetti, & Aber, 1995; Zajonc, 1980). Positive emotions can greatly broaden, and negative emotions markedly narrow, the perceptual field and the range of cognitive processes and behavioral alternatives (Easterbrook, 1959; Fredrickson, 1998; Isen, 1987; Izard et al., 1965; McNally, 1996). Multiple factors determine whether the emotions motivate cognition and action that reflect effective adaptation or move the individual along a pathway toward maladaptive outcomes. Understanding the causal processes for these contrasting trajectories requires analysis of developmental changes in emotion motivation and in the connections between emotions, cognition, and action.

Patterns of emotions and emotion–cognition interactions help explain the internalizing processes in anxiety and depression (Blumberg & Izard, 1985; Izard, 1972; Nolen–Hoeksema, Parker, & Larson, 1994). Emotions form the motivational basis for empathy and prosocial behavior as well as acts of peer rejection, aggression, and violence (Eisenberg & Fabes, 1998; Hoffman, 2000). Clearly, emotion science, which enjoys contributions from several distinct disciplines, has made numerous, and very substantial, advances in our understanding of normal and abnormal behavior in the past three decades (Cacioppo & Gard-

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ner, 1999; Davidson & Scheerer, 2000). Yet, no one has established a prevention program based singularly, or even primarily, on emotion theory and research (Izard, 2001, 2002). The present paper focuses on theory that emphasizes utilization of the inherently adaptive functions of emotions, the direct effects of emotions on normal and abnormal development, and ways of developing emotion-centered preventive interventions for children at risk for behavior problems and psychopathology. It describes concepts and suggests techniques for experimental forms of emotion-centered programs that aim to optimize the utilization of emotion motivation in preventing psychopathology and facilitating positive behavioral outcomes.

Over the past 20 years psychologists and educators have collaborated in the development of many school-based programs for enhancing social competence and decreasing disruptive and aggressive behavior in the schools (Institute of Medicine, 1994; Weissberg & Greenberg, 1998). An extensive meta-analysis showed that most of these programs have positive effects on children's behavior. Effect sizes ranged from .24 to .93 (Durlak & Wells, 1997). A meta-analysis that focused on 35 programs with a social skills component found a modest mean effect size of .20 in children who fit the broad category of emotional or behavioral disorders (EBD; Quinn, Kavale, Mathur, Rutherford, & Forness, 1999). This effect size indicates that on average, only 58% of the children with EBD realized benefits from the social skills training programs. The authors noted that most studies showed small effects. Moreover, effect sizes did not differ on the basis of duration of intervention and age of participant and differed only minimally in terms of categories of raters (e.g., teachers, parents) who provided the outcome measures.

Interpreting the results of meta-analytic studies of intervention outcomes and deciding what produces the observed effects and who benefits proves to be difficult. First, relatively few of the programs have manuals that specify the substance and techniques of the program (Durlak & Wells, 1997). Second, when they do describe program procedures, the descriptions often lack the detail necessary to precisely determine the content and intervention activities of the program (Mathur & Rutherford, 1996). Third, effectiveness of programs may vary when they focus on particular types of problems (Lochman & Lenhart, 1993; Quinn et al., 1999). Fourth, almost all existing school-based prevention programs have multiple components, but no one has shown the relative efficacy of the different aspects of these interventions. Even when considering the programs in their entirety, evaluation of them in terms of long-term benefits and theoretical explanation of behavioral change shows that very few earn high ratings (Bear, Webster–Stratton, Furlong, & Rhee, 2000).

Although the pioneers in preventive interventions (e.g., Conduct Problems Prevention Research Group, 1999a, 1999b; Cowen et al., 1996; Feshbach & Feshbach, 1982; Greenberg & Kusche, 1993; Solomon, Watson, Delucchi, Schaps, & Battistich, 1988; Spivak & Shure, 1982; Weissberg, Caplan, & Bennetto, 1988) have demonstrated the positive benefits of their programs, much work remains before we have a prevention science (Coie et al., 1993). Science demands methods that enable some precision in identifying the causes of measured effects. Precise attribution of causal processes for the effects of multicomponent preventions based on multiple theories poses serious problems. Adequate explanation of normal or abnormal behavioral change requires programs or program components and evaluation research with a coherent theoretical framework. With few exceptions (e.g., Cicchetti, Toth, & Rogosch, 1999), programs and program evaluation research have not met this requirement. For a multicomponent program this requirement entails a design that enables a comparative evaluation of the theoretically distinct aspects of the program.

A number of experts in developmental psychopathology and preventive intervention have noted the need for theory-based programs (Coie et al., 1993) or programs that test theory as it relates to normal and abnormal development (Cicchetti & Toth, 1992). The considerable gulf between the status of emotion science and its application in clinics and schools

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points to the need for programs that test theories of emotional development (Weisz, Donenberg, Han, & Weiss, 1995). A number of widely used prevention programs have a substantial emotions component (Beland, 1997; Greenberg, Kusche, Cook, & Quamma, 1995, PATHS; Spivak & Shure, 1989, ICPS). These programs have enjoyed some success when implemented as stand-alone programs or as one of several units in multitheory, multimethod interventions (Conduct Problems Prevention Research Group, 1999a, 1999b; Greenberg & Kusche, 1993; Shure & Spivak, 1979; Van Schoiack–Edstrom, Frey, & Beland, in press). However, these programs contain, not only an emotions component, but other components as well (e.g., self-control techniques, social skills training). Moreover, the various components derive from multiple theoretical frameworks, ranging from cognitive (interpersonal cognitive problem solving; Spivack & Shure, 1989) to a mix of elements from the traditions of psychoanalysis, cognitive-behavioral, ecological, and discrete emotions theory (PATHS; Greenberg & Kusche, 1993). Their multicomponent content and eclectic conceptual approaches make it virtually impossible to specify causal processes in outcomes or behavioral change. Therefore, despite their widespread use in U.S. schools and some evidence for their effectiveness, these programs as currently implemented and evaluated have severe limitations in their ability to contribute to our understanding of normal and abnormal developmental processes and the explanation of intervention-influenced behavior change.

The present paper addresses some of the issues of specifying theoretical substance and techniques for preventive interventions. It provides an example of a conceptual framework and suggestive models of prevention programs that enable hypothesis testing and theoretical explanation of change. To determine what preventive interventions can add to our understanding of development and the processes involved in facilitating behavioral change, we propose that researchers build programs or program components tightly based on a single theory. Evaluation research that enables interpretation of effects requires that they have a theory-based manual for trainers, teachers, or others involved in implementing the program. They need to make all the background material in the intervention manual (including all the information they share with the children) consistent with the chosen theory. Moreover, the theory should guide all the specific intervention techniques, including those relating to understanding emotions, emotion regulation, program-related peer interactions (e.g., role play), and teacher–child interactions (e.g., scripted teacher–child dialogues). They should make sure that the children's books used for story time to supplement the content and techniques of a prevention program lesson have themes, thoughts, and actions consistent with the theoretical framework.

Differential Emotions Theory and Its Implications for Prevention Science

Differential emotions theory (DET; Abe & Izard, 1999a; Ackerman, Abe, & Izard, 1998; Izard, 1971, 1977, 1989, 1992, 1993; Izard, Ackerman, Schoff, & Fine, 2000; Malatesta & Izard, 1984) provides the conceptual framework for the preliminary versions of a universal intervention and several targeted interventions described in later sections of this paper. DET consists of a loosely organized and evolving set of propositions and principles influenced by the seminal theories of Darwin (1872/1965), James (1890/1950), and Tomkins, (1962, 1963) and the large body of empirical research on discrete emotions and emotional development over the past 30 years.

Three tenets of DET have special significance for preventive interventions because they provide a basis for understanding normal and abnormal development and the processes that facilitate behavioral change. These tenets concern the adaptive advantages of emotion utilization, the construct of intersystem connections for explaining normal and abnormal development, and the roles of the organizational and motivational functions of the discrete emotions in development and intervention-influenced behavioral change. The first two of these tenets set the stage for applying

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the third in the development of preventive interventions.

The adaptive advantages of emotion utilization

For more than a century, numerous scientists in various disciplines have identified the emotions as inherently adaptive and testified to their critical role in the individual and social behavior involved in survival and adaptation (Darwin, 1872/1965; Hamburg, 1963; Izard, 1977, 2001; James, 1890/1950; Plutchik, 1980). The adaptive advantages of the emotions have no less relevance for contemporary life than they did in the early phases of human evolution. Indeed, the demands placed on us by the complexities of contemporary life may make the emotions and their effective and constructive utilization more important than ever. In any case, a great deal of theory and empirical research supports the notion that the emotions have adaptive functions (Cacioppo & Gardner, 1999; Campos, Mumme, Kermoian, & Campos, 1994; Izard, 1977; Malatesta, 1990). Some theorists have argued that the emotions are the primary motivational system for human behavior (Izard, 1971; Tomkins, 1962, 1963).

Each of the emotions has distinct motivational and adaptive functions that contribute to adaptation (Izard, 1991). For example, the emotion of interest engages the infant and child in the exploration of the physical and social environment, learning, and the development of skills involved in person–environment interactions (Langsdorf, Izard, Rayias, & Hembree, 1983; Renninger & Wozniak, 1985). Joy rewards successful efforts in achievement and mastery, bolsters confidence (Izard, 1977), facilitates creativity and certain types of problem solving (Isen, 1987), and helps mitigate the undesirable effects of negative emotions (Fredrickson & Levenson, 1998). Sadness motivates evaluation of the source of trouble and the search for social support and for strengthening of family and social bonds (Averill, 1983; Saarni, 1990; Tomkins, 1963), and the vicarious sadness of empathy may lead to helping behavior (Hoffman, 2000). Anger can increase courage and support constructive self-assertion (Izard, 1977). Fear motivates protective behavior and leads to the strengthening of alliances (Eibl–Eibesfeldt, 1971; Plutchik, 1980). Although any emotion that runs out of control in terms of frequency or intensity can have maladaptive effects, all emotions, including the ones we call negative, can have significantly beneficial effects on behavior, well-being, and adaptation (Izard & Ackerman, 2000). Thus, if we subscribe to the notion that the emotions have inherently adaptive functions that play a critical role in adaptation, then we need to exert much more effort in developing preventive interventions that enhance children's abilities to understand and modulate emotions and utilize their organizational and motivational functions.

Forming intersystem connections: A key process in normal and abnormal development

DET assumes that each of a limited set of basic emotions exists as a modular system. These discrete emotion systems can operate independently of cortical processing and higher order cognition (Izard, 1993; LeDoux, Romanski, & Xagoraris, 1989). DET's emphasis on modularity and the capacity of emotion systems to operate independently focuses attention on the evolutionary basis of emotions and their inherently adaptive functions. The concepts of modularity and relative independence of emotions and cognition highlight the need to attend to the processes involved in connections and communications among systems. During the course of development, connections among the emotions and cognitive systems enable them to become highly interactive (Ackerman, Abe, & Izard, 1998; cf. Cicchetti & Hesse, 1983; Cicchetti & Schneider–Rosen, 1986; Lazarus, 1991; Sroufe, 1996). Yet, these systems retain their capacity for independent operation (Izard, 1993).

The relative independence of emotion systems is most apparent in early development. Much of emotion–expressive behavior appears to be innately determined (Izard & Malatesta, 1987). Emotion–expressive behavior emerges in fairly normal fashion in deaf and blind children who lack language (Goodenough,

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1933; Thompson, 1941). Its structure and social–communicative functions become apparent in early infancy and remain invariant over time (Izard, 1997). Similarity in certain emotion–behavior relations across the life span suggests that the quality of the core emotion feeling state of each of the basic emotions is also invariant (Campos & Barrett, 1984; Izard & Ackerman, 1997).

Such evidence suggests that what develops in emotional development consists mainly of intersystem connections, particularly connections among emotions, images, and thoughts (Ackerman et al., 1998; Izard, 1977). Although emotion–behavior relations in early development suggest that emotion experiences have significance in the infant's consciousness (Izard et al., 1995; Sroufe, 1996), the elaboration of the meaning of emotion feelings for individual and social behavior awaits their connection to language. Language enables the symbolization of emotions in awareness and provides a powerful tool for emotion modulation and utilization (Greenberg & Paivio, 1997; Izard, 1971).

Whereas emotion–expressive behavior and the capacity to experience emotions emerge largely as a function of the unfolding of biogenetic processes in a normative social environment (Izard et al., 1995), such causal processes do not explain emotion–cognition connections. Like the acquisition of language (Lenneberg, 1967), the symbolization of emotions in awareness is not an automatic process or one that proceeds simply as a result of maturation. Dialogue about emotions and emotion coaching seem necessary for the optimal development of emotion–cognition connections (Dunn, Brown, & Beardsall, 1991; Gottman, Katz, & Hooven, 1996). Both the learning of a language and the forming of connections between words and feelings requires experience and timely practice in a social context. The "acquisition of language is guaranteed for children up to the age of six, becomes steadily compromised from then until shortly after puberty, and is rare thereafter" (Pinker, 1994, p. 293). Moreover, a harsh emotional environment can further complicate the learning of language and the critical processes involved in emotion–language connections. The evidence suggests that there may be a critical or sensitive period for the development of connections between language and the emotions, which is the basis for the highly complex mental domain of emotion–cognition relations (Izard, 1984, 1992).

Depending on multiple factors, including child characteristics such as emotionality or temperament and family characteristics such as emotional climate and parenting practices, children can fail to make connections between certain emotion feelings and their labels or make maladaptive emotion–cognition connections (Ackerman et al., 1998; Izard, 1977; Izard & Harris, 1995; Rogosch et al., 1995). Maladaptive emotion–cognition connections appear in such forms as hostile attributions (Crick & Dodge, 1994) or anger bias (Pollak, Cicchetti, Hornung, & Reed, 2000; Schultz, Izard, & Ackerman, 2000).

Emotion–cognition connections are critical to the processes of acquiring emotion knowledge and understanding emotions. Research has shown that children's poor performance on tests of emotion knowledge predict later academic and behavior problems and abnormal development (e.g., Field & Walden, 1982; Izard et al., 2001; Schultz, Izard, Ackerman, & Youngstrom, 2001; see Denham, 1998, for a review). The findings from this research suggest the need for evaluating theory-based programs that facilitate the development of emotion knowledge, particularly in children at risk for psychopathology. These findings also suggest that children will benefit from programs that increase understanding of the functions of emotions and foster skills for the modulation and adaptive utilization of emotion motivation. Such an emotion-centered program should contain a component on linking emotion motivation to prosocial behavior through the use of emotion perspective taking and other empathy-related techniques.

The organizational and motivational functions of discrete emotions in development and preventive interventions

Applying DET and the principles for integrating emotion concepts into preventive interventions (Izard, 2002) requires attention to

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developmental theory and the empirical data on growth and change in the various biological and behavioral systems of the individual (cf. Cicchetti & Schneider–Rosen, 1986; Coie et al., 1993). A comprehensive developmental theory of both normal and abnormal trajectories and with a life span perspective may represent the ideal, but no such theory exists (Cicchetti & Cohen, 1995). Nevertheless, DET (Abe & Izard, 1999a; Izard, 1991, 1993; Izard & Ackerman, 2000; Izard et al., 2000), together with the organizational perspective on development (Cicchetti, 1993; Cicchetti & Schneider–Rosen, 1986; Santostefano, 1978; Sroufe & Rutter, 1984; Werner, 1957), provides a general conceptual framework for applying emotion science in developmentally appropriate ways.

In terms of the organizational perspective, development occurs as a function of recurring hierarchical reorganizations within and among brain or neural, emotion, cognitive, linguistic, and action systems (cf. Cicchetti & Schneider–Rosen, 1986; Cicchetti & Tucker, 1994). Development proceeds from relatively simple to more articulated and complex systems. In general, reorganization occurs as initially undifferentiated systems, which become more differentiated through growth and experience.

Differential emotions theorists accept the general framework of the organizational perspective but qualify it by adding four distinct emphases. (a) The emotion systems initially have a higher degree of organization than other systems. For example, emotion expressions are preadapted to facilitate the infants' transactions in the social environment (Izard & Malatesta, 1987; Tronick, 1989). (b) Particular discrete emotions and patterns of emotions have stage-salient developmental functions. Emotions provide the motivation for the processes and activities (e.g., completing stage-relevant developmental tasks) that lead to differentiation and reorganization within and among systems (Abe & Izard, 1999a). (c) The relatively independent functioning and powerful motivational thrusts of the emotion systems in infancy and early childhood create frequently recurring disequilibriums. These disequilibriums call for further systems differentiation, increases in intersystem connections, and reorganization within and among systems (Ackerman et al., 1998; Izard et al., 2000). (d) Optimal development of the intersystem connections that produce more articulated and complex organismic systems requires biogenetic input and sensitive emotion socialization (cf. Shipman & Zeman, 2001). Children who do not receive adequate emotional stimulation and support during development, especially in infancy and early childhood, may benefit from an emotion-centered intervention designed to prevent maladaptive emotion–cognition connections and abnormal emotional development.

Emotions, development, and prevention in infancy: 0–2 years

The assumptions that the emotions can operate relatively independently of cognition and that connections between these systems need nurturing have particular relevance in the first 2 years of life. In early infancy, sensory input often follows the thalamoamygdala route or low road to rapid and seemingly automatic emotion activation (Izard & Malatesta, 1987; LeDoux, 1996; Malatesta & Izard, 1984). The relative immaturity of the prefrontal cortex (Greenberg & Fisher, 1999; Thompson & Nelson, 2001) means that the cortical processing involved in emotion–cognition relations (Bechara, Damasio, Tranel, & Damasio, 1997) can have little or no impact on the emotion activation process or emotion response. Evidence from neuroscience, experts' descriptions of the infant as an emotional being (Emde, Gaensbauer, & Harmon, 1976; Sroufe, 1996), and systematic observation of infants' behavior (Izard et al., 1995) testify to the frequency of infants' emotion expressions and lack of cognitive controls. The rapidity and seeming automaticity with which infants respond to provocative stimuli (Haviland & Lelwica, 1987; Izard et al., 1995; Izard & Malatesta, 1987; Stanton, 2000) call for adaptation of regulatory techniques to suit the mode of emotion activation, particularly in stressful situations.

This apparent automaticity in emotion activation and response in early infancy suggests that we should make emotion regulatory techniques emotion focused and emotional in sub-

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stance. The primary goal is to modulate the emotion arousal to facilitate the forming of connections between the emotion motivation and adaptive responses. Effective techniques will depend heavily on emotion communication through expressive behavior. Even young infants can discriminate and respond in meaningful ways to various emotion expressions (Haviland & Lelwica, 1987; Izard et al., 1995; Tronick, 1989).

Infants' high emotional responsiveness and strong interest in the human face (Langsdorf et al., 1983) and biological motion (Fox & McDaniel, 1982) suggest that infancy constitutes a sensitive period for preventive interventions that derive from face to face play. Practice in face to face play involving positive emotion expressions will help infants learn emotion–behavior relations and pass their first developmental task: acquiring the ability to participate in synchronized dyadic interactions (Tronick & Gianino, 1986; Weinberg & Tronick, 1994). Moreover, increasing the frequency of positive emotion experiences has salubrious effects on mental and physical health (Fredrickson, 2000). Joy can serve as a recuperative factor following negative emotion experiences, as well as an antidote for stress (Izard, 1977; Lazarus, 1991).

Intervention techniques based on face–face play and including synchronized positive emotion expressions, together with warm and sensitive emotional responsiveness, will also help infants succeed with a second important developmental task, that of establishing a reliable social bond or secure attachment (Isabella & Belsky, 1991). Implementation and evaluation of such intervention techniques for infants who are beginning to show signs of insecure attachment can test hypotheses relating to the significance of positive emotion expression and emotion communication in the prevention of insecure (avoidant, ambivalent, or disorganized) attachment patterns (Cicchetti et al., 1999). Such patterns tend to persist over time and predict negative behavioral outcomes (Waters, Hamilton, & Weinfield, 2000).

Parent training in positive emotion expression and induction in parent–infant interactions will foster secure attachment processes, reduce infants' negative emotion experiences, and help prevent the long-term effects of persistent negative emotion expression and the stress associated with it. High negative emotion expression in 18-month-old infants predicts high scores on trait neuroticism and low scores on extroversion and agreeableness in the preschool years (Abe & Izard, 1999b; cf. Shipman & Zeman, 2001). Thus, frequent negative emotion expression in infancy may indicate a risk for the development of temperament or personality characteristics associated with oppositional, aggressive, or withdrawal behavior. Targeted emotion-centered intervention to facilitate induction of positive emotions, modulation of negative emotions, and effective emotion utilization can test hypotheses relating to the role of emotion processes in the early development of traits of emotionality and temperament.

Emotions, development, and prevention in early childhood: 2–5 years

Rapid and remarkable advances in emotion regulation and language skills in preschoolers make intervention techniques concerned with intersystem connections particularly salient. By age 2 years, a child can exercise some control over emotion expression, even in response to acute pain (Izard, Hembree, & Huebner, 1987). Throughout the preschool period, maturation and emotion socialization contribute to substantial increases in emotion regulation and set the stage for rapid increases in emotion vocabulary, feeling–thought connections, and the other aspects of emotion–cognition relations. In normal development, these processes lead to significant growth in preschool children's emotion knowledge, emotion expression modulation, and constructive utilization of emotion motivation. (For reviews of related research, see Denham, 1998, and Hyson, 1994.) Due in part to the rapid growth in emotion–cognition connections between 2 and 5 years, this epoch represents a sensitive period for developing a dependable foundation for accurate perception and labeling of the emotions of self and others. Maladaptive emotion–cognition connections in this period contribute to and sustain misperceptions and

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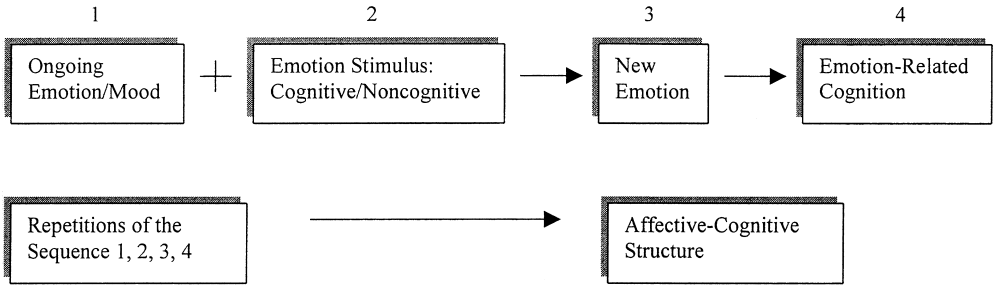


Figure 1. Developing emotion–cognition connections and affective–cognitive structures.

misattributions that result in poor peer relations and other forms of abnormal behavior, including aggression (Crick & Dodge, 1994; Rogosch et al., 1995; Schultz et al., 2000).

Forming emotion–cognition connections. Figure 1 shows the steps in the process of forming the emotion–cognition connections that contribute to the development of emotion knowledge. The process begins with an ongoing mood (Step 1). Sometimes the ongoing mood is the characteristic mood associated with the child's temperament (e.g., happy disposition, anger proneness) or with a recent emotion-eliciting situation. Step 2 consists of processing a noncognitive or cognitive stimulus that leads to Step 3, activation of a new emotion. In young children, Step 4 in forming an emotion–cognition connection often consists of labeling and articulating the new emotion in relation to its context. Emotion labeling (matching a feeling with a word or symbolizing an emotion in consciousness) represents a simple but rather basic affective–cognitive structure or emotion–cognition connection. Mislabeling an emotion (e.g., sadness as anger) may occur when the ongoing negative mood is anger. Moreover, an ongoing anger mood or anger proneness can contribute to a faulty appraisal of a new event, the activation of an inappropriate emotion, and the formation of a maladaptive emotion–cognition connection.

Figure 2 shows the steps that may occur when the ongoing mood interacting with appraisal processes activates not only an emotion feeling but also an event-congruent emotion memory. The emotion memory may relate to a perceptually similar event in the past. Such an emotion memory will likely amplify the newly activated emotion and contribute to the formation of strong affective–cognitive structure and more elaborate emotion memory.

Symbolizing emotions in awareness. Increasing adaptive emotion–cognition connections and affective–cognitive structures increases children's ability to talk about emotion feelings and keep them at a high level of awareness. Awareness of emotions and ability to express them verbally enable children to modulate them through use of techniques such as cognitive restructuring (Harris & Lipian, 1989). Thus, increasing adaptive emotion–cognition connections and the ability to symbolize emotions in consciousness is a highly significant developmental task for the preschool years. An impoverished emotion vocabulary and the related inability to perceive and label emotion cues in the self and others indicate the need for emotion-centered preventive intervention. Techniques and procedures for interventions in this period could include activities such as emotion recognition and labeling tasks (Greenberg et al., 1995). Another potentially useful technique is interactive reading of emotion stories to encourage labeling and articulation of emotion feelings. This and other techniques that increase children's ability to symbolize emotion feelings in awareness and articulate them will increase their ability to understand the causes and functions of emotions (Dunn, Bretherton, & Munn, 1987; Gottman, Katz, & Hooven, 1997; Katz, Gottman, & Hooven, 1996). Children's awareness of their emotions as phenomena that motivate and influence

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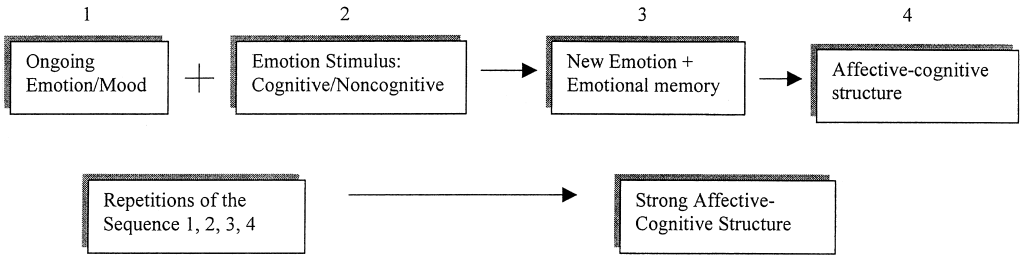


Figure 2. Emotional memories and affective–cognitive structures.

their thoughts and actions will help them pass the early childhood developmental task of increasing one's sense of self-awareness and agency (Dunn et al., 1987).

Because of the increase in awareness and symbolization of emotions in the preschool years, new meanings can become associated with emotion activators. This development in emotion–cognition or language relations holds particularly for the emotion of anger because of its role in the frequent expressions of autonomy during this period (Erikson, 1963; Spitz, 1957). Simple restraints, such as regular times to have meals, get a bath, and go to bed, may cause only relatively fleeting frustration and anger in infants. They may activate strong anger and resistance in preschoolers who sense the restraints as denying them self-expression, interrupting activities in which they are deeply involved or acting as barriers to strongly desired goals (Erikson, 1963). The intensity of the preschooler's response to restraint and discipline varies with several factors, including type of parental discipline, child temperament or emotionality, level of emotion expression in the family, and family emotional climate (Eisenberg, Fabes, & Losoya, 1997; Kochanska, Tjebkes, & Forman, 1998; cf. Shipman & Zeman, 2001). Frequent negative emotion expressions of high intensity, particularly anger expression and aggressive behavior, in response to routine restraints at home or in the preschool setting may indicate a need for a preventive intervention that includes techniques for emotion regulation and the redirection of emotion motivation into effective coping strategies (Abe & Izard, 1999b). The intervention should be timed to deal with the surge in anger expression and oppositional–defiant behavior that often occurs in the early part of the toddler–preschool period of development (Dunn & Munn, 1987; Wenar, 1982).

Facilitating the development of empathy and sociomoral behavior. In the toddler–preschool period, shame and guilt emerge as possible mechanisms for controlling anger and facilitating the development of empathy (Abe & Izard, 1999a; Eisenberg & Hand, 1979; Hoffman, 2000). The latter part of the preschool years may represent a sensitive period for emotion-induction techniques that foster the development of empathy, sympathy, and prosocial orientation. These techniques should foster consideration of the feelings of others and facilitate the forming of adaptive connections between emotions and the cognitive and action systems in a social context. A critical connection is that between the motivation of empathic emotion arousal and the thoughts and actions involved in helping behavior.

Parents of children at risk might be trained to provide them with opportunities (e.g., pretend play, role play, emotion story time) for experiencing, directly or vicariously, the emotions involved in empathy (sadness, anticipatory guilt). These opportunities must occur in an emotionally warm and trusting relationship. The parent needs to monitor the intensity of the child's emotional response to the stimulus and, if necessary, help the child modulate the empathic arousal. Children who react intensely to another's plight and cannot regulate their empathic emotion arousal often fail to make a prosocial response (Eisenberg et al., 1996). Successful application of empathy-based techniques helps the preschool child

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pass another important developmental task of this period: increasing one's understanding of others (cf. Eisenberg & Fabes, 1998; Hoffman, 2000).

Successful application of preschool prevention techniques that foster consideration of the feelings of others, empathy, and the utilization of the accompanying emotion motivation helps lay the foundation for the development of conscience and morality (cf. Dunn, Brown, & Maguire, 1995). As early as the toddler and preschool years, emotion-centered preventive interventions can facilitate the development of emotion-based moral reasoning and positive social behavior (Denham, 1986; Eisenberg & Hand, 1979). The emotions involved in empathy provide the motivation for sociomoral behavior (cf. Bear, Richards, & Gibbs, 1997; Eisenberg & Fabes, 1998; Hoffman, 2000). Inductive discipline and a positive emotional climate in the family foster the development of empathy (Hoffman, 2000; Krevans & Gibbs, 1996). Maltreatment or abuse may deprive young children of opportunities to develop the emotion knowledge necessary for empathy and moral behavior (Rogosch et al., 1995; Smetana, Daddis, et al., 1999; Smetana, Toth, et al., 1999). Maltreatment may also contribute to the development of atypical emotional responses to moral transgressions. Maltreated toddlers are much more likely than nonmaltreated toddlers of a similar age and background to respond to another child's distress not only by failing to show empathy but also with a display of threatening behavior, diffuse anger, or aggressive assaults (Main & George, 1985).

Gains in empathic responding and moral reasoning help preschool children make progress in the important developmental task of managing the self-conscious or self-evaluative emotions (Abe & Izard, 1999a). The emotions, which emerge with the developing self-concept, include guilt, shame, and the more complex affective–cognitive structures like pride, envy, and jealousy (Abe & Izard, 1999a; Lewis, Sullivan, Stanger, & Weiss, 1989). Empathy that leads to successful helping behavior can help children understand and manage guilt, in this case anticipatory guilt for failure to help (Hoffman, 1976; Krevans & Gibbs, 1996). Empathy or sympathy followed by responsible action is an adaptive way to resolve the anticipatory guilt and feel pride in responsible behavior (cf. Hoffman, 2000).

Although research shows significant positive relations between parental use of emotion induction (e.g., inductive discipline), empathy, and prosocial behavior (Hoffman, 2000; Krevans & Gibbs, 1996), it has not shown that a school-based preventive intervention can use these techniques to obtain similar positive benefits. Once established, such interventions could test developmental hypotheses relating to the roots of empathy and sympathy, the conditions for their emergence, and their roles in the development of moral reasoning and socially responsible behavior (Hoffman, 2000) and the prevention of aggression (Eisenberg & Fabes, 1998).

Emotions, development, and prevention in middle and late childhood: 6–12 years

In middle and late childhood, children rapidly increase the number and variety of emotion–cognition connections that relate to their self-concepts and social life. At the same time, children of this age experience other profound changes in their emotion systems and behavioral ecology (Abe & Izard, 1999a). First, thresholds for the activation of emotions by peer-related stimuli decrease markedly. As a result, interest in social interactions increases, and peers become an increasingly important source of excitement and enjoyment. The interest–joy pattern that motivated face–face play with the caregiver and object play and exploration of the physical environment in infancy (Termine & Izard, 1988) now becomes more important as motivation for peer interactions. As a result of these changes in their emotion systems, older children greatly increase the time they spend with peers and without supervision of adults (Ladd, 1996).

Second, although 6- to 12-year-olds realize a lot of their positive emotion experiences in the context of peer interactions, they also have to contend with an increase in negative emotion experiences within and outside the family. These negative emotion experiences stem in part from a big increase in the amount of

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critical social and academic feedback about their performance and competencies (Higgins & Parsons, 1983). Third, the increase in negative emotions from social interactions in middle–late childhood may contribute to the perception of a decrease in parental warmth and uncritical acceptance (Maccoby, 1984; Warton & Goodnow, 1991). Such a perceived change in parental attitude may present a challenge to children's positive self-conceptions. This challenge may peak in the early part of middle childhood, when children typically overestimate their qualities and abilities in all domains of the self-concept (Harter, 1986). Partly as a function of these changes in emotion systems and behavioral ecology, children in middle and late childhood often experience the self-conscious emotions (shame, guilt, contempt) in the context of self-evaluation and social comparison. These emotions and related affective–cognitive structures such as pride and jealousy become prominent players in developmental processes such as achieving peer acceptance and making friends (Gottman & Mettetal, 1986; Hartup, 1983).

Prevention programs should help older children to increase their ability to conceptualize and manage the self-conscious emotions and to engage in higher levels of emotion and social perspective taking (cf. Hoffman, 2000). They need the skills to engage in self-evaluation and social comparison without becoming unduly self-critical, anxious, withdrawn, or depressed. Acquiring these skills may call for preventive techniques that help children understand the various positive and negative effects of social comparison. They need to learn to utilize the self-conscious emotions to motivate social skills that facilitate peer acceptance and friendship. Techniques that children can use to activate and sustain shared positive emotions will prove helpful (Fredrickson, 2001; Izard, 1977). Preventive programs in this period also need to show sensitivity to the emergence of traitlike self-concepts and the task of achieving a higher level of self-identity and emotional maturity (Erikson, 1963; Harter, 1986; Marcia, 1966).

Emotion and social perspective taking techniques should help children realize the value of considering the feelings of others, empathy, and sympathy as working tools in making and keeping friends. Many experimental studies have found positive relations between indexes of empathy and positive social behavior (see Eisenberg & Fabes, 1998, for a review). Empathy-training programs for children in this period have shown promise, but their authors have not yet produced much in the way of objective data supporting their validation (e.g., Feshbach & Feshbach, 1982).

Few preventive interventions have given attention to the self-conscious emotions as causal factors in social acceptance and peer status in older children. No established program has dealt explicitly with the difficult emotion of contempt and its role in motivating children's acts of peer rejection, a well-known cause of behavior problems and psychopathology (Hubbard, 2001). Preventive intervention programs in middle and late childhood should increase awareness of the subtle forms of contempt that stem from perceived differences in ethnic, cultural, and religious backgrounds. These expressions of contempt are tantamount to peer rejection or neglect (Izard, 1977, 1991; Jones, 1997). Prevention programs should encourage the development of norms against these forms of contempt and their consequences. They also need to address the problem of shame as a critical aspect of the victim's response to rejection (Baumeister, Smart, & Boden, 1996). The paucity of research on these emotion processes may reflect the negative attitudes and stigma associated with experiencing shame and expressing contempt for others (Izard, 1971; cf. Tomkins, 1963). In any case, these emotion processes and the other changes in the emotion systems and behavioral ecology may make the middle and late childhood years a sensitive period for the application of prevention programs that promote positive social values and altruistic perspectives.

From emotion theory and research to prevention programs: Preliminary models

To illustrate the translation of DET and related research into preventive interventions, we present a synopsis of an emotion-centered (EC) program. It is being developed for pre-

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schools (e.g., Head Start) and elementary schools that serve populations with a high proportion of children at risk for behavior problems and psychopathology. We discuss directions for some targeted interventions or EC booster sessions designed to help children who are beginning to exhibit precursors or early symptoms of developmental psychopathology. The ideas and techniques for booster sessions or targeted interventions focus on aggressive behavior, peer rejection, social withdrawal, and breakdowns in emotion communication due to maternal depression. EC has been implemented in pilot trials in Head Start and elementary grades one and two, but evaluation research is still underway.

EC focuses on understanding, modulating, and utilizing emotions. It includes training in peer interactions, particularly helping behavior, but it frames the teaching and learning of social skills in emotional terms. EC emphasizes the need for increased awareness of the emotions of self and others. It advocates utilization of the inherently adaptive functions of emotions, particularly those involved in empathy and prosocial behavior. EC has preliminary drafts of manuals for preschool (Izard, 2000) and early elementary grade children (Izard & Bear, 1999). We describe the preschool version of the EC manual.

Teachers' manual for program implementation

The first part of the manual consists of three chapters of background material relating to (a) the role of the teacher in helping children manage their emotions and link them to socially responsible behavior, (b) the psychology of emotions (their expression, feeling states, and functions), and (c) socioemotional competence.

The second part of the manual contains 20 lessons, each consisting of two to five parts, making a total of 68 modules or teaching units. Teachers do two or three modules a week for approximately 5 months. Modules are synchronized with appropriate classroom activities of the standard curriculum. Teachers are encouraged to use EC techniques and principles throughout the day. The manual also includes teacher–child dialogues for helping children modulate intense emotions. The EC lessons cover the following topics:

Emotion recognition increases children's awareness of their own internal signals and the signals in the expressive behavior of others. *Emotion labeling* helps children acquire an emotion vocabulary to enable them to express themselves adequately when they need to talk about their emotion feelings. *Emotion communication* gives children practice in expressing their feelings and in talking to other children about emotion feelings, through puppet play, pretend play, and "tell me a time" (about an emotion-eliciting event). *Emotion story time* engages children in interactive reading of an age appropriate story that features a discrete emotion and increases understanding of event–emotion–behavior relations. *Emotion activation* teaches children a range of internal and external events that activate or cause each of the basic emotions and helps them understand that some conflicts arise because different children feel differently about a particular event or situation. *Emotion–behavior relations* helps children understand the relations among their feelings, thoughts, and actions and see how children are alike and different in what causes their emotions and in their reactions to them. *Emotion regulation and emotion utilization* gives children practice in modulating emotion expression, instrumental actions that have regulatory functions, and emotion-focused coping techniques that help children learn to use emotion motivation in constructive ways (Izard, 1971, 2002; Izard & Kobak, 1991; Polivy, 1998; cf. Kennedy–Moore & Watson, 1999). Techniques include role play, pretend play, and various interactive games. Children learn an emotion-theory based technique for anger control. They learn specific things to do and one "key" thing to do to regulate the various emotions in ways consistent with differential emotions theory. *Empathy and emotion utilization in fair play and prosocial behavior* help children learn to respond to the motivation stemming from the emotions involved in empathy or sympathy with helping behavior or other appropriate action. Teachers are reminded that empathic responding and empa-

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thy- or sympathy-based prosocial behavior represents the highest form of emotion utilization (Eisenberg & Strayer, 1987; Hoffman, 1978, 2000; Izard, 2002; Strayer, 1993). Several lessons teach children empathic responding by teaching them how to help another child who feels sad (or mad or scared).

In the preface to the EC lessons, we emphasize that teachers should follow the basic premises of preschool education: help children develop emotion-related abilities by enabling them to learn by doing and through direct experience. To facilitate learning and retention of EC material, we encourage induction of appropriate emotion experiences through puppet play, pretend play, other games, and emotion stories (cf. Heuer & Reisberg, 1992). Throughout the implementation of EC, we encourage teachers to help children with emotions "on-line," as they experience them. They are also encouraged to show enthusiasm for the program, maintain a positive emotional climate in the classroom, and induce the positive emotions frequently. EC emphasizes the need to capture and maintain children's interest to facilitate learning and constructive activities (Renninger & Wozniak, 1985). It encourages the use of activities that ensure frequent success experiences to activate enjoyment. EC conceives the interest–activity–joy sequences as a means of helping young children at risk form connections between their endeavors and the joy of achievement and between the joy of achievement and the feelings of self-efficacy and well-being (Fredrickson, 1998; Izard, 1977).

Parent participation in EC

Prevention researchers generally agree that effective programs require parent involvement (Bear et al., 2000; Brooks–Gunn, Klebanov, & Duncan, 1996; Coie et al., 1993). EC includes parent meetings to increase understanding of emotions and the importance of parent–child emotion communication. Topics for these meetings include timely discourse about feelings (Dunn et al., 1991) and emotion coaching (Gottman et al., 1996). In addition, the program staff sends parents a weekly highlight of the emotion lesson being taught by the teacher. The format of this message to parents requires them to have some lesson-relevant dialogue with the child, record the childs' responses, and return the responses to the teacher. The completed forms provide data on the amount and quality of parent participation.

Distinctive features of EC

A number of established programs (e.g., PATHS, L. S. Greenberg & Kusche, 1993; Second Step, Beland, 1997) share content similar to that in the EC lessons. EC differs from the other programs in its strict adherence to DET and related empirical research in shaping the philosophy and practical applications of the program. More than any other program, EC emphasizes the inherently adaptive functions of each of the basic emotions. It stresses the importance of the modulation of emotion arousal and expression but not simply to achieve emotion regulation or anger control, which represents a major emphasis in other programs (e.g., PATHS; Second Step). EC also teaches emotion modulation as a means of mediating emotion utilization. The program contains techniques specifically designed to help children capitalize on the adaptive aspects of the motivation associated with each of the discrete emotions.

EC also differs in specific ways from programs having similar content. For example, the EC exercises in emotion recognition and labeling include use of cross-culturally standardized expression photographs or expressions (Izard, 1971) and consensually validated photographs of an ethnically diverse group of children expressing the various discrete emotions (Schultz et al., 2000).

Toward the development of targeted EC interventions

Many successful school-based interventions have both a universal component (administered to the whole class or school) and booster sessions that target children who are at high risk for serious behavior problems and psychopathology (e.g., Conduct Problems Prevention Research Group, 1999a, 1999b). Other

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interventions target only a specific group of high risk children (e.g., aggressive children; Lochman & Lenhart, 1993). Below we use DET and related research to analyze two problems or syndromes relating to externalizing behavior and two relating to internalizing behavior. We attempt to identify precursors of these problems that could signal the need for preventive intervention. Finally, we suggest DET-based principles and techniques for developing intervention materials to prevent these problems through booster sessions designed to complement the implementation of EC as a universal program or for separate targeted interventions.

Emotions and peer rejection. Past research has linked peer rejection to the development and maintenance of externalizing disorders such as criminality and delinquency, internalizing disorders such as depression and social withdrawal, and academic difficulties such as dropping out of school (McDougall, Hymel, Vaillancourt, & Mercer, 2001). Various problems relating to the development of the emotion systems and emotion–cognition relations contribute to childrens' difficulties in achieving peer acceptance and avoiding serious psychosocial problems.

Precursors and emotion-related causal processes of peer rejection. Impulsive behavior, lack of behavioral and attentional control (Rothbart, Ahadi, & Hershey, 1994), and other early signs of problems in understanding and regulating emotions may signal the onset of social problems that eventually result in peer rejection. Children who are unable to cope constructively with their feelings are less popular and less socially competent than those who have good emotion regulation strategies (Eisenberg, Fabes, Nyman, Bernzweig, & Pinuelas, 1994).

Particular deficits in emotion knowledge, involving lack of skills in perceiving and labeling emotion signals in oneself, others, and various contexts, contribute to peer rejection (Arsenio, Cooperman, & Lover, 2000; Denham, McKinley, Couchoud, & Holt, 1990; Mostow, Izard, Fine, & Trentacosta, 2002). Children unable to accurately perceive their peers' emotion expressions and make reasonable inferences about their feelings run the risk of responding inappropriately and increasing the probability of peer rejection (Mostow et al., 2002). Peer-rejected childrens' deficits in emotion knowledge may help explain why they show less empathic responding than their more socially accepted classmates. Responding with sympathy to a peer's distress requires two emotion-related skills: the ability to perceive accurately others' emotion signals and the ability to modulate one's own negative emotions to prevent too much concern with one's own emotion state. Children who have difficulties with either of these tasks will be unable to demonstrate sympathy and respond prosocially toward peers. Either they will misinterpret their peers' emotion cues or they will become overwhelmed with personal distress in response to their peers' negative emotion (Eisenberg et al., 1996). Children's socially ineffective responses to others' distress undoubtedly contribute to their rejection by their peers. In turn, peer rejection often manifests itself in aggressive, antisocial, and disruptive behavior (Coie et al., 1990; Hartup, 1983; Mostow et al., 2002).

As described earlier, DET holds that, in addition to the adverse effect of deficits in emotion knowledge, expressions of contempt (e.g., unjustifiable exclusion of others) and the experience of shame by the victim play a significant role in peer rejection and its consequences. Despite the prevalence of such forms of contempt and their wide-ranging effects in shame–anger connections, aggression (Baumeister et al., 1996), racism (Jones, 1997), and peer rejection, they have received little attention in preventive interventions.

Intervention techniques to address the emotion-related aspects of peer rejection. Emotion-centered prevention of peer rejection begins with teaching the basic skills of emotion perception and emotion labeling that lead to emotion knowledge. These basic emotion-related skills that enable children to talk about inner experiences and respond effectively to those of others remain fundamental to social communication and social relations through the life span (Bandura, 1986; Izard & Ackerman, 1997). Other prevention techniques that

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should help enhance peer-relevant emotion knowledge include activities that provide opportunities to learn emotion–behavior connections involved in peer relations. These activities (e.g., role-play, emotion story time) help children learn that failure to detect the emotions of a peer can lead to misunderstandings and conflict.

Prevention programs for peer rejection should also provide opportunities to experience and respond to the emotions involved in empathy, sympathy, and prosocial behavior. Training in empathic responding should emphasize its important role in making and keeping friends, a critical step in young children's achieving social competence (Vaughn et al., 2000). Inducing sympathy-related emotions such as sadness and anticipatory guilt (Hoffman, 2000) in a safe and controlled environment and teaching children how to modulate and utilize the motivational thrust of empathic emotions in helping behavior can help them learn to avoid aggressive encounters (Staub, 1986). Emotion-based empathy training techniques can directly counteract the factors in peer rejection by helping children understand the devastating effects of aggressive behavior. It can also help them understand the adverse effects of contempt (excluding others) and its role in causing others to feel shame and anger and retaliate with aggressive behavior.

Implementing and evaluating carefully controlled, theory-based techniques aimed at preventing peer rejection will enable researchers to test hypotheses relating to the role of specific deficits or breakdowns in emotion perception and emotion labeling in peer rejection. Such intervention efforts will also provide opportunities to get a better fix on the role of particular discrete emotions like contempt and shame in the processes that lead to maladaptive social behavior.

Anger and aggression. Although anger can have constructive effects (Averill, 1983; Izard, 1977), it often results in aggression in young children. Once a child begins to show a pattern of aggressive behavior, it often becomes stable over time (Farrington, 1991; Olweus, 1979). Childhood aggression relates to many negative outcomes, such as antisocial behavior in adolescence and adulthood (Coie & Dodge, 1998; Farrington, 1991). Anger is the emotion most relevant to aggression. Therefore, emotion-centered programs should specifically target processes related to anger as well as patterns of emotions in which other emotions might trigger or amplify anger and lead to violence (Baumeister et al., 1996).

Emotion-related processes in childhood aggression. Recent research reveals that anger perception bias and emotion regulation are significant factors in aggressive behavior. Anger perception bias is seeing anger cues in the expressive behavior of others and in various situations where none exist. It is similar to the construct of hostile attribution bias (Crick & Dodge, 1994), although it relies on different theoretical assumptions and measurement techniques (Schultz et al., 2000). Anger perception bias has been reliably measured in children in preschool and elementary school (Barth & Bastiani, 1997; Schultz et al., 2000) and in children that have been physically abused (Pollak et al., 2000). Because anger perception bias relates to aggression, it may well be a factor in the poor emotion regulation manifested in impulsive behavior. Recent studies have linked poor emotion regulation to aggression in children from preschool to middle school and in maltreated children (Garner, 1995; Schwartz & Proctor, 2000; Shields & Cicchetti, 1998). Emotion dysregulation makes a distinct contribution in differentiating between children who are bullies and children who are not prone to aggressive dominance or bullying (Shields & Cicchetti, 2001).

Addressing anger bias and aggression with emotion-centered techniques. Although interventions that target anger perception bias might prove beneficial for children of all ages, the techniques described below should prove especially useful for preschool children. Physical aggression peaks in preschool (Coie & Dodge, 1998), and preschool is the first extensive opportunity for children to learn to regulate their emotions in a social environment (Walden & Smith, 1997). Many preschool children cannot yet distinguish pictorial or conceptual representations of anger from other negative emotions (Denham, 1998; Stein &

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Jewett, 1984). Also, children make many of the adaptive emotion–cognition connections that either foster or prevent anger perception bias during the preschool years. Finally, because childhood aggression is best targeted during preschool, it is vitally important to include parents in the targeted intervention. Not only are many parenting factors related to aggression (Coie & Dodge, 1998), but during preschool, parents are still the most consistent presence in their child's life.

Prevention techniques for anger prone children need to target the faulty emotion–cognition connections that result in anger perception bias and aggressive acts. Programs can address anger perception bias through adaptations of the emotion recognition and labeling techniques described earlier. Emotion recognition exercises for children who are beginning to show anger bias or aggressive behavior should focus on helping them distinguish the various components of anger expressions from the components of other expressions (e.g., expressions of sadness). Preschool children, particularly those at risk, also may need help in learning to distinguish emotion-specific signals from ambiguous and mixed signals (Schultz et al., 2000). Role play, including teacher modeling of emotion-specific expressions and actions, will help in demonstrating contrasting signals and effects of anger and other emotions. Specially adapted techniques for children who show anger bias and anger proneness should also focus on anger modulation and empathic responding (cf. Eisenberg & Fabes, 1998; Staub, 1986).

Emotions and internalizing difficulties in childhood. Emotions and emotion–cognition relations play an important role in the emergence of internalizing syndromes in childhood, suggesting the need for emotion-based interventions that target internalizing processes. Depression, anxiety, and the experience of intropunitive emotions such as shame, guilt, and sadness typify internalizing symptoms (Achenbach, 1991; Zahn–Waxler, Klimes–Dougan, & Slattery, 2000). Researchers have identified numerous risk factors for the emergence of internalizing behaviors in childhood (Duggal, Carlson, Sroufe, & Egeland, 2001; Mesman, Bongers, & Koot, 2001), including deficits in emotion perception accuracy and emotion knowledge (Denham, 1998; Fine et al., 2001; Izard et al., 2001; Schultz et al., 2001) and inability to manage the self-conscious emotions (Zahn–Waxler et al., 1990).

Internalizing behaviors have not been studied as thoroughly as have externalizing behaviors, nor have they often been the target of interventions, except where they are comorbid with externalizing behaviors (Beitchman, Inglis, & Schachter, 1992; Zahn–Waxler et al., 2000). However, evidence suggests that internalizing behaviors in childhood are associated with serious outcomes, including social isolation and withdrawal during childhood and depressive disorders and suicidal ideation in adolescence (Ialongo, Edelsohn, Werthamer–Larsson, Crockett, & Kellam, 1993; Wangby, Bergman, & Magnusson, 1999; for a review, see Kovacs & Devlin, 1998; cf. Fischer, Rolf, Hasazi, & Cummings, 1984).

Emotion-related casual processes and precursors of internalizing difficulties. Although not inherently maladaptive, negative emotion such as sadness, fear, and guilt can be activated in situations where they are not appropriate, and the resulting moods can become long in duration and high in intensity (Watson & Clark, 1992). Maladaptive emotion activation and experience of negative emotions that lead to internalizing behavior occurs through faulty intersystem (emotion–cognition) connections. It may also occur through faulty connections between two or more emotions, as in the case of prolonged sadness activating anger or inner directed hostility (Tomkins, 1963; cf. Blumberg & Izard, 1986; Izard, 1972). Through repeated social interactions, faulty connections can become "preferred or default solutions," further increasing and strengthening the faulty links between emotions and cognitions, making their recurrence more likely (Izard et al., 2000).

Maladaptive emotion patterns and emotion–cognition–action sequences that contribute to internalizing processes may result from adverse, high-stress environments that include hostile family climate, insecure attachments to caregivers, conflict-laden interactions between family members, and low threshold for

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experience of negative emotions (Ackerman et al., 1998; Izard et al., 2000). Given maladaptive connections among emotion systems, situations that bring on sadness would trigger inappropriate emotions and cognition bound to it through higher order system connections and patterns. Children prone to experience maladaptive emotion patterns might be more vulnerable to experiencing internalizing symptoms in the face of stressful situations.

Testing emotion theories of internalizing through preventive intervention. DET suggests that maladaptive emotion patterns and faulty emotion–cognition connections contribute to internalizing cognition and behavior. These causal processes are promoted and sustained in part by deficits in understanding and regulating emotions, particularly the self-conscious emotions, and by deficits in understanding relations among emotions. However, researchers have not thoroughly explored these causal connections across development or the possibility of changing them through theory-based intervention techniques. Techniques directed toward increasing understanding and management of self-conscious emotions, emotion patterns, and emotion–cognition connections should help prevent internalizing difficulties in children. Inclusion of lessons that increase children's ability to understand relations among emotions in anxiety and depression (e.g., understanding that extended sadness over failure can activate inner-directed anger or shame; Tomkins, 1963) can test specific hypotheses relating to deficits in understanding and managing the self-conscious emotions and emotion patterns and their influence on the development of internalizing disorders in childhood.

Maternal depression and emotional problems in children. Rates of depression are estimated at 8–12% for mothers of young children in the general population (Lovejoy, Graczyk, O'Hare, & Neuman, 2000), with markedly higher rates for lower socioeconomic groups (Cummings & Davies, 1994). Mothers' depression is related to a wide range of emotional difficulties and impaired social competencies in their children, including childhood depression, suicidal behavior, conduct disorder, attention deficit hyperactivity disorder, and anxiety disorder (Cummings & Davies, 1994; Kaslow, Deering, & Racusin, 1994). These difficulties continue throughout life, extending beyond the mother's depressive episode (Camras, Sachs–Alter, & Ribordy, 1996; Kaslow et al., 1994).

Emotions-related causal processes in the effects of maternal depression on children. Depressed mothers show a more negative emotion style, including increased hostility, higher rates of negative interactions, and more impatient use of directives in guiding child behavior than do normal mothers (Cummings & Davies, 1994). Maternal emotion style is a stronger predictor of children's coping style than maternal diagnostic status (Hamilton, Hanmen, Minasian, & Jones, 1993). Compared to depressed mothers, well mothers explain the causes of emotions, especially positive emotions, in more developmentally appropriate ways. Depressed mothers are less likely to elaborate as to causes and more likely to focus on negative emotions (Zahn–Waxler et al., 1990). They are also less responsive to child behavior and show less warmth (Lovejoy et al., 2000; Pound, Puckering, Cox, & Mills, 1988).

Maternal displays of intense negative emotion and other maladaptive aspects of parent–child emotion communication adversely affect the development of emotion knowledge (Dunn & Brown, 1994). Parenting behaviors characteristic of depressed mothers are correlated with a lack of emotion knowledge in their children (Camras et al., 1996). This outcome may result from the ineffective communication skills practiced by depressed mothers. Compared to well mothers, depressed mothers are less effective in using infant-directed speech to guide their infants' attention, resulting in less learning by their children (Kaplan, Bachorowski, Smoski, & Hudenko, in press).

In addition to affecting patterns of expression, regulation, and the growth of emotion knowledge, maternal depression may affect children's overall feelings about themselves and the world. Caregivers' accessibility and responsivity are correlated with positive self-representations (Cicchetti, Rogosch, Toth, & Spagnola, 1997). Children living with de-

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pressed parents are more likely to experience consistently intense negative emotional environments, with unreliable need fulfillment by their parents, leading to negative self-representations (Cicchetti et al., 1997; Cummings & Davies, 1994) and insecure attachment to the caregiver (Cicchetti et al., 1999).

Children of depressed mothers differ from children of well mothers in emotion expression, emotion regulation, and emotion knowledge. They also tend to show less responsivity to their mothers (Kaplan et al., in press; Murray, Sinclair, Cooper, Ducournau, & Turner, 1999). Altered patterns in these emotion and emotion–cognition processes have been linked to difficulties such as childhood depression and conduct disorder, as well as social problems (Camras et al., 1996).

Greater inhibition of expressed tension and frustration in infants (Cole, Barrett, & Zahn–Waxler, 1992) and a preference for less personal expression in play in 5-year-olds (Murray et al., 1999) characterize the expressive patterns of children of depressed mothers. In children of well mothers, feelings of guilt tend to increase and become increasingly associated with empathy and concern about interpersonal relationships. In contrast, for young children of depressed mothers, feelings of guilt seem to cause overarousal and extreme concern, and for older children, the guilt is expressed less explicitly and produces less empathy (Zahn–Waxler et al., 1990). This decrease in the responsiveness to guilt producing situations may develop as a mechanism to protect the child from continued overarousal.

Children's ability to regulate emotion arousal is strongly influenced by the quality of emotion communication in parent–child interactions in the first few years of life (Tronick, 1989). Insensitive and hostile communication is excessively challenging and negatively arousing, interfering with the child's emerging capacity to regulate arousal (Cummings & Davies, 1994). The diminished capacity to regulate arousal translates into emotional and behavioral difficulties.

Intervention techniques to address the emotion-related aspects of maternal depression. Based on the tenets of DET, an emotion-centered intervention program for children of depressed mothers would address difficulties with emotion expression, regulation, and communication and attempt to increase understanding of sadness and guilt, as well as overall emotion knowledge. Parent training involving specific techniques for improving emotion communication (e.g., coaching in positively toned infant-directed speech) may increase the feelings of self-efficacy for these parents, leading them to view their parenting role more positively (Lovejoy et al., 2000; Weissman et al., 1972).

Treatment of mothers' depressive symptoms decreases reports of behavior and relationship problems with their infants (Cooper & Murray, 1997). Interventions are needed that directly address the damaged relationship between parent and child. One approach that shows promise is toddler–parent psychotherapy, which demonstrates effectiveness in improving the attachment security of toddlers through exposing the mother–child dyad to corrective emotional experiences under the guidance of a therapist (Cicchetti et al., 1999).

Children with greater emotion knowledge have mothers who both value emotional expression and endorse an approach to child rearing involving induction (Denham, 1993) and positive, contingent responsiveness (Denham, Zoller, & Couchoud, 1994). These findings suggest that teaching depressed mothers the EC techniques of positive emotion induction combined with specific methods to facilitate communication about emotion, such as puppet play and interactive reading of emotion stories, may prove effective in increasing the emotion skills of their children.

Emotion-Centered Preventive Interventions as Avenues for Developmental Research

As behavioral scientists, we must continually press forward in our efforts to apply knowledge gained through empirical investigations to science-based applications that promise to benefit the children and families whom we study and ultimately serve (Cicchetti & Toth, 2000). Theory-based preventive interventions represent the ideal medium in which to realize this pursuit. They provide a framework for

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both translating basic science into practice and using evidence from the evaluations of these applications to further inform theories of normal and abnormal development. In this paper, we present an approach to applying theoretically coherent universal and targeted preventive intervention techniques grounded in tenets of DET (Izard, 1993, 2002). We identify sensitive periods throughout childhood during which certain emotion-related processes and abilities are critical to accomplishing developmental tasks. For each period, we suggest theory-based intervention techniques that may facilitate optimal emotional development. In this final section, we discuss how application of theory-based intervention techniques in both universal and targeted programs can inform us about the processes that contribute to normal and abnormal development.

Theoretically coherent emotion-centered prevention programs

In previous sections of this paper, we discuss key developmental tasks or issues for each period of normal childhood development and identify emotion processes and abilities that may be necessary to enable children to successfully negotiate these tasks. Carefully controlled research investigating universal implementations of emotion-centered prevention programs at each developmental period may provide support for these claims and insights into the direct and indirect effects of increasing children's emotion-related skills. A theoretically coherent prevention program provides the opportunity to implement specific techniques designed to promote a particular emotion-related ability in the midst of a sensitive period, such as preschool, and evaluate differences in later outcomes, such as prosocial activity or externalizing behavior and peer rejection in early elementary school. Moreover, theoretically coherent applications provide the opportunity to determine what program components are necessary and sufficient to prevent the development of negative outcomes.

For example, DET asserts that one of the critical emotional processes throughout the preschool years is the formation of emotion–cognition connections. As language emerges and children develop a theory of mind and the ability to symbolize emotions in consciousness, they increase their emotion vocabulary and their ability to identify emotions in others. These achievements and abilities enable children to develop empathy-related skills. The theory suggests that recognizing and labeling emotions in others is the intermediate outcome of the formation of connections between the emotion systems and cognition. We hypothesize that when these connections to the emotion systems fail to develop normally and involve inappropriate or ineffective concepts and schemas, children are at risk for misperception and misinterpretation of others' emotion signals, subsequent social and behavioral blunders, and maladaptive development, including inability to empathize, externalizing behavior, and peer rejection. Longitudinal investigation of a theoretically coherent universal prevention program that includes lessons designed to increase emotion labeling and recognition abilities would permit researchers to test the hypothesis that these emotion-related skills are necessary to promote the development of empathy. Through comparison with the control group, one could test the hypothesis that without these emotion-related abilities that facilitate empathy and prosocial behavior, children are at greater risk for the development of behavior problems and psychopathology.

Theoretically coherent preventive interventions applied at salient developmental periods permit testing of specific hypotheses about the contributions of particular emotion-related abilities to normal development in concurrent and later periods. In addition, implementing a theoretically coherent emotion-centered prevention program provides the opportunity to study the salubrious effects of a positive emotional climate in the classroom. When all children in a class experience the benefit of positive emotion inductions and also receive lessons in emotion knowledge, emotion modulation, and emotion utilization, they should realize two related advantages. It is likely that they will benefit not only from scaffolding of their own emotion-related abilities but also from a

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more positive emotional climate that is due in part to classmates' increased empathy-related abilities and general awareness of individual differences in emotionality. Intervention research that utilizes multilevel models to examine both individual- and classroom-level differences in emotion-related factors can begin to inform our thinking about the effects in increasing the individual child's ability to manage emotions and the effects of classroom climate on children's continuing development.

Targeted emotion-centered preventive intervention programs

In previous sections, we identify internalizing and externalizing syndromes that may be amenable to targeted emotion-centered intervention techniques or booster sessions within the context of universal prevention programs. We also describe empirically determined factors that may suggest that a child is at risk for developing psychopathology. Empirical evidence supports the notion that quantifiable risk factors predict later psychopathology (Ackerman, Izard, Schoff, Youngstrom, & Kogos, 1999). Research using targeted interventions in different periods of development will enable us to test specific hypotheses about the developmental risk of deficiencies in adaptive intersystem connections and emotion modulation and utlization. Research that identifies children at risk for a particular outcome (e.g., emotion perception bias) and utilizes specific emotion-related techniques (emotion recognition and labeling) to intervene can provide valuable insights into causal processes in development.

For example, DET hypothesizes that shared positive emotion experiences are essential to the formation of an adaptive infant–caregiver bond. In the absence of these reciprocal emotion interactions, we hypothesize that children are at risk for maladaptive emotional development and insecure attachments to their primary caregiver, which may lead to additional negative outcomes across the life span (Cassidy & Shaver, 1999). Researchers using prevention programs that target at-risk infants based on circumstances such as caregiver depression or family instability or changes in primary caregivers might consider specific emotion-related techniques such as structured infant–caregiver positive emotion interactions and caregiver emotion coaching. Then they could include pre- and postintervention assessment of attachment in the evaluation battery, along with measures of emotion understanding and responding, and test hypotheses about the role of positive emotion and emotion coaching in the formation of the infant–caregiver bond.

Another form of targeted interventions involves booster sessions with at-risk children in the context of a larger universal EC program. Research involving booster sessions can provide opportunities to investigate effects of further exposure to specific techniques on those who are experiencing deficits in emotion-related abilities (e.g., lessons targeted at increasing emotion-motivated interpersonal skills for children at risk for developing internalizing disorders). Studies involving different numbers of booster sessions can provide an examination of dose–response effects of emotion-centered intervention techniques on high risk children.

Conclusion

As we progress toward a prevention science, carefully controlled research utilizing theoretically coherent prevention programs will be vital to establishing the field and to enhancing our knowledge about emotion processes in normal and abnormal development. Although we do not claim that a single theory can completely explain the complexity of emotional development, we think DET and techniques derived from it can promote well-designed studies of both universal and targeted preventive interventions. In this paper, we discuss several specific hypotheses about the role of emotion modulation, emotion utilization, and the formation of intersystem connections in several periods of development. We suggest a model of prevention that will enable testing of these ideas through carefully controlled research. Theoretically coherent emotion-centered prevention programs and evaluation research will, as basic research has done in the past, help shape and modify both the specific hypothe-

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ses and the general ideas surrounding theories of emotional development. Such prevention research will in turn lead to new and more refined intervention techniques that further facilitate the development of socioemotional competence and reduce the risk for abnormal emotional development.

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