

# Translating Emotion Theory and Research Into Preventive Interventions

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Scientific advances in the field of emotions suggest a framework for conceptualizing the emotion-related aspects of prevention programs that aim to enhance children's socioemotional competence and prevent the emergence of behavior problems and psychopathology. A conception of emotions as inherently adaptive and motivational and the related empirical evidence from several disciplines and specialities suggest 7 principles for developing preventive interventions: the utilization of positive and negative emotions, emotion modulation as a mediator of emotion utilization, emotion patterns in states and traits, different processes of emotion activation, emotion communication in early life, and the development of connections for the modular and relatively independent emotions and cognitive systems. Each principle's practical implications and application in current prevention programs are discussed.

Almost from its beginning, psychology has consisted of both a science and a profession, and an uneasy relation between the two. William James (1890/1950), who defined the field more than a century ago, had a lab and saw patients, but the relations between his science and practice have remained largely unknown (Taylor, 1999). This uneasy relation between the major aspects of psychology continued through the 20th century, leaving a wide gulf between the science and practice of psychology (Weisz, Donenberg, Han, & Weiss, 1995). Experts have noted the dearth of mental health projects that integrate theory, findings from basic research, intervention, and careful evaluation of treatments or programs (Cicchetti & Toth, 1999; Coie et al., 1993). Recent efforts to encourage and support work on translating basic research into treatment and prevention programs (National Advisory Mental Health Council's Behavioral Science Workgroup, 2000) offer a bright promise for helping close the gap between science and practice.

In the present article, I attempt to translate emotion theory and research into principles for developing preventive interventions in the first 12 years of life. I focus on deriving theoretical principles for programs intended to enhance socioemotional competence and prevent the development of behavior problems and psychopathology. Some of the principles may prove applicable to other types of interventions and at any age, but they stem from theory and research on infants and children. In keeping with concepts in "prevention science" (Coie et al., 1993), I draw from emotion theory and research in attempting to derive principles to guide the

selection and shaping of techniques that address fundamental causal processes in the early development of risk and protective factors. Many widely used prevention programs share this goal. However, when evaluated with stringent criteria, such as objective assessment of long-term behavioral outcomes and theoretical explanations of change, very few programs merit high ratings (Bear, Webster-Stratton, Furlong, & Rhee, 2000). Many widely used school-based programs have not yet identified precisely what factors mediate change and how they do it, and these achievements probably will not happen until there are closer relations between science and practice.

In this effort to translate emotion theory and research into principles and techniques for interventions that lend themselves to hypothesis testing, I begin with a statement on the nature of emotions. A number of emotion theories provide support for a major theme of this review: the idea that emotions have a profound influence on perception, cognition, and action (e.g., Campos, Mumme, Kermoian, & Campos, 1994; Damasio, 1994, 1998; Frijda, 1986; Lazarus, 1991; Sroufe, 1984). These theories also agree that emotions have adaptive functions. Some of the newer functionalist theories define emotion in terms of readiness, goal-oriented action, or what the individual is trying to do to influence a person–environment transaction (Campos et al., 1994; Kagan, 1994b; Saarni, Mumme, & Campos, 1998). They share much common ground with older theories of emotion that stress the significance of the functions of emotions in human development and adaptation (Darwin, 1872/1965; Hamburg, 1963; Izard, 1971, 1977; James, 1890/1950; Plutchik, 1980; Tomkins, 1962, 1963).

After the statement on the nature of emotions, which draws from a number of theories, I use differential emotions theory and the cross-theoretical emphasis on the functions of emotions in describing the conceptual and empirical basis of seven principles for developing primary prevention programs. I then discuss the implications of these principles and identify preventive interventions that have demonstrated the usefulness of concepts and techniques relating to the principles. Examining applications of the principles or their relations to current programs requires consideration of the programs' use, not only of discrete emotion concepts, but also of more global emotion-related concepts such as attachment, sociomoral values, prosocial orientation, and caring community.

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### The Nature of Emotions

The emotions are essential aspects of human nature. They represent a significant part of our evolutionary-biological and cultural heritage and our adaptation to the physical and social environment (Darwin, 1872/1965; Ekman & Friesen, 1971; Hamburg, 1963; Izard, 1971; Plutchik, 1980). They play a critical role in the evolution, ontogeny, and functioning of consciousness (Cacioppo & Gardner, 1999; Damasio, 1999; Izard, 1977; cf. Rolls, 1999). They form the basis for conscience and moral behavior through their role in empathy, sympathy, and caring (Eisenberg & Fabes, 1998; Eisenberg & Miller, 1987; Hoffman, 1978, 2000). Emotion activation sensitizes us to the interesting and challenging features of our social and physical environment. Emotion feelings define the quality of human experience. They motivate adaptive thought and action. They facilitate prosocial behavior and creative problem solving (Isen, Johnson, Mertz, & Robinson, 1985; Isen, Daubman, & Nowicki, 1987). Emotions form the basis for temperament and personality (Goldsmith & Campos, 1982; Izard, Libero, Putnam, & Haynes, 1993; Malatesta, 1990; cf. Watson & Clark, 1992).

Emotion expressiveness and emotional warmth and responsiveness provide the foundation for the infant's social bonds, including the pivotal attachment to the mother or primary caregiver (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1980; Izard, Haynes, Chisholm, & Baak, 1991; Sroufe, 1984, 1986, 1996). Emotion communication based on accurate decoding and encoding of emotion signals enhances and sustains social interactions and relationships throughout the life span (Hobson, 1995; Izard & Ackerman, 1997). Emotions uncontrolled or gone awry figure prominently in the development of depression, aggression, violence, and other forms of psychopathology (Cicchetti & Cohen, 1995; Dodge & Somberg, 1987; Hubbard & Coie, 1994; Izard & Harris, 1995; Lochman & Lenhart, 1993).

Despite their prominent place in human life, the emotions did not find a central place in science until the last quarter of the 20th century. Even since their rise to prominence, a substantial percentage of researchers have treated emotions as epiphenomena of cognition. A number of theorists view them as dependent on the attainment of certain cognitive abilities for their emergence in ontogeny (M. Lewis, Sullivan, & Michalson, 1983) and as always dependent on cognitive appraisal for their activation (Lazarus, 1991; Oatley & Jenkins, 1992). The emergence of some emotions, such as shame and guilt, does depend on cognitive attainments relating to the self-concept (M. Lewis, Sullivan, Stanger, & Weiss, 1989), and emotions do often arise from the cognitive processes of memory, appraisal, and attribution (Arnold, 1968; Lazarus, 1991; Smith & Ellsworth, 1985; Weiner, 1985; Weiner, Graham, & Chandler, 1982). Moreover, emotional experiences typically involve interactions of feelings, images, and thoughts.

Nevertheless, emotion states also result from noncognitive processes and, at least in part, from trait emotionality or temperament, which sets emotion thresholds (Eisenberg, Fabes, & Losoya, 1997; Izard, 1993). Even in the activation of emotion by appraisal or attribution, the causal processes of emotion and cognition are most likely reciprocal. Ongoing feelings, as well as emerging emotion states, influence the activation of cognitive processes which may, in turn, activate new emotions (Izard, 1993; cf. Lazarus, 1991). Though often intimately related to cognition, emotion as subjective awareness of a feeling or motivational state has unique functional

properties and some independence of cognitive processes (Damasio, 1994; Izard, 1993; LeDoux, 1996; Zajonc, 1980). The unique functions of each basic emotion and the relative independence of the emotions and cognitive systems have implications for translating emotion theory and research into preventive interventions. For example, compared with the relative ease of recognizing and labeling emotions with clear cognitive antecedents, one might experience more difficulty associating language with emotions arising from such noncognitive processes as periodic changes in hormone levels, unanticipated pain, and vague stress (Izard, 1993). Thus, authors of interventions that promote socioemotional competence need to consider the possible contribution of noncognitive processes, including background temperament and emotionality (Izard, 1993; B. Smith, 1994).

If emotions had no unique functions and no capacity to operate independently, theorists could relegate them to the domain of cognition and deal with them as any other type of information. Emotions do contain information (Clare et al., 1996; Izard, 1971, 1993), but they also have subjectively experienced feeling and motivational states like no other type of information (Damasio, 1999; Izard, 1990b; Rolls, 1999). Emotion feelings are the primitives of awareness, capable of influencing mind before they register in self-reflective consciousness. They have preemptory access to channels serving imagery, decision making, and instrumental action (Bechara et al., 1995). Emotion information can translate ordinary cognition into creative thought (Isen, 1984), trigger a courageous act of altruism, or power impulsive violence (Baumeister, Smart, & Boden, 1996; H. Lewis, 1971).

### Emotions and Prevention

A number of scholars have done general reviews or meta-analytic studies of preventive interventions (Bear et al., 2000; Corcoran, 2000; Durlak & Wells, 1997; Quinn, Kavale, Mathur, Rutherford, & Forness, 1999; van IJzendoorn, Juffer, & Duyvesteyn, 1995; Weissberg, 2000; Weissberg & Bell, 1997; Weissberg & Greenberg, 1998). The reviews show that with a few exceptions (e.g., L. S. Greenberg & Paivio, 1997; M. T. Greenberg & Kusche, 1993), approaches to the treatment and prevention of behavior problems and psychopathology have not integrated concepts of emotions as organizing and motivational factors that can facilitate behavioral change and the development of socioemotional competence.

#### *Conceptions of Emotions in Primary Prevention*

Most of the programs that target infants and toddlers and their primary caregivers draw mainly from the psychodynamic tradition and attachment theory (Fraiberg, 1980; Greenspan, 1992; Lieberman & Zeanah, 1999). They generally do not involve discrete emotion concepts, but they deal with emotions on a more global level, in terms of relationship issues and attachment behavior. They attempt to improve the quality of attachment, decrease maternal stress (negative emotion), and increase positive emotional climate in the parent-child relationship (Cicchetti, Toth, & Rogosch, 1999).

Virtually all school-based primary prevention programs benefited from the pioneering work of the late Emory Cowen (e.g., see Cicchetti, Rappaport, Sandler, & Weissberg, 2000; Cowen et al., 1996, for history and overviews). Perhaps because Cowen had

enjoyed some success with his prevention program almost a quarter century before the emotion revolution, specific emotion concepts and techniques do not figure in his work. His work was the harbinger of a robust movement that produced numerous school-based programs designed to enhance mental health and decrease aggression and other behavior problems. Some of the programs influenced by Cowen do contain either specific emotion concepts or global constructs relating to them.

However, the strong tendency of many researchers to treat all emotions as part of cognition or as cognitively dependent phenomena markedly influenced efforts to develop school-based primary prevention programs. Many of them stem from theories that explain aggression and other social problems in terms of disordered or deficient thinking or as a function of biased or inadequate information processing, and they often do this without reference to the role of emotion motivation and utilization as factors in resolving the problems (e.g., Crick & Dodge, 1994; Spivack & Shure, 1982). A few prevention programs ignore both emotion and cognition while focusing solely on attempts to modify behavior. Considerable data support these social-cognitive and behavioral conceptions of problems in psychosocial adjustment and the prevention programs intended to ameliorate or prevent them (see Bear, 1998, for a review).

#### *Emotion Components in Existing Programs*

Although a few school-based programs have a discrete emotions component, perhaps none has thoroughly integrated the concept of emotions as motivational and inherently adaptive and consistently used principles and techniques that facilitate optimal utilization of the energy and motivation of emotion arousal. The few programs that have a discrete emotions component focus it more on emotion understanding and emotion regulation in relation to anger control than on activities designed to take advantage of the inherently adaptive functions of emotions. With very few exceptions (e.g., Lochman, 1992), they treat emotion regulation less extensively than emotion understanding and utilization and emphasize problem-focused techniques (e.g., ask the child to stop and think; identify the problem, feeling, and goal, and start generating and evaluating solutions; M. T. Greenberg & Kusche, 1993, p. 63).

An extensive meta-analytic study of 177 school-based prevention programs revealed that they typically focus on training in social skills and interpersonal problem solving (Durlak & Wells, 1997). Most of these programs showed increases in children's social competence and decreases in behavior problems (range of effect sizes = 0.24–0.93). Another meta-analysis of 35 studies of social skills training programs for children with emotional or behavioral disorders found an average effect size of 0.20, indicating that only 58% of the children would accrue benefit from participation (Quinn et al., 1999).

It may prove very difficult or impossible to determine the effect of the emotion component, or any specific component, of existing programs. In the larger meta-analytic study (Durlak & Wells, 1997), only 29.3% of the 177 programs reported the existence of an intervention manual, and the absence of a manual as well as their evaluation research designs make it impossible to determine what components of the various programs contributed to the positive outcomes. Similarity among programs also make it difficult to do comparative studies; the authors of existing programs borrow

freely from each other, resulting in much similarity in content and techniques. Indeed, many of the most popular school-based prevention programs operate as a consortium (Elias et al., 1997). Some of these programs acknowledge the importance of integrating affect and emotional learning without identifying the theoretical basis or specific techniques for translating this idea into practice (see Elias et al., 1997).

Because several extensive reviews of existing prevention programs already exist, another such review is neither necessary nor within the scope of the present article. Rather, I review the emotion research that supports theoretical principles for developing preventive interventions and look to successful prevention programs for evidence relating to applications of the principles. Because the social skills and social problem-solving programs have little emotion content other than that relating to anger control, I look mainly to the programs that deal with discrete emotions or with global constructs (e.g., attachment, empathy, caring community) that relate to emotions.

Although some programs with an emotions component, as well as some without one, produce positive outcomes (Bear et al., 2000; Durlak & Wells, 1997), unresolved questions remain. Why do these programs work? The empirical studies evaluating these programs have not explained the process of change or demonstrated changes that clearly relate to underlying theory. Do social skills training programs work better if they have an emotions component? Do some programs benefit by eschewing discrete emotion concepts and treating emotion indirectly or in terms of more global constructs like prosocial values and caring community (Solomon, Watson, Battistich, Schaps, & Delucchi, 1996)? Would such programs achieve better results if they added content and techniques relating to specific emotions and an emphasis on emotion motivation and utilization? To begin addressing these questions, one must first explore both the science of emotions and ways of translating emotion theory and the findings of emotion research into emotion-centered prevention programs.

#### *Principles for Emotion-Centered Preventive Intervention*

The principles for developing preventive interventions derive primarily from the central thesis that motivation and adaptiveness are the core defining features of emotions. A number of theorists may find this proposition acceptable, and a number of theories lend support to one or more of the principles. All the principles are consistent with differential emotions theory (Abe & Izard, 1999a; Ackerman, Abe, & Izard, 1998; Izard, 1977, 1993; Izard, Ackerman, Schoff, & Fine, 2000; Izard & Malatesta, 1987; for a perspective on differential emotions theory and its relation to other theories, see Cornelius, 1996; LaFreniere, 2000; Strongman, 1978). The seven principles do not represent categorically different content areas. They form an interrelated set of ideas. In particular, Principles 1 and 2, 4 and 5, and 6 and 7 form complementary pairs, and Principle 3 on linking emotion modulation to emotion utilization relates to all the others.

##### *Principle 1: The Activation and Utilization of Positive Emotions Increase Sociability, Personal Well-Being, and Constructive Behavior*

Emotion feelings are unique in their ability to capture and dominate the mind, to preempt information processing channels,

color perception and cognition, and influence our actions (Bower, 1981, 1987; Isen et al., 1985; Izard, Wehmer, Livsey, & Jennings, 1965; Niedenthal & Kitayama, 1994; Zajonc, 1980). The activation of the positive emotions of interest and joy and their variants have many therapeutic and preventive effects—motivating learning and exploration, the development of social bonds, and activities that counter the stress of sustained negative emotions (Fredrickson & Levenson, 1998; Isen, 2000; Izard, 1977; M. Lewis, 1993; Ryan & Deci, 2000; Tomkins, 1962). Building in part on differential emotions theory, a recent model interprets the positive emotions as the primary means to broaden and build psychological resources, enlarge thought–action repertoires, mitigate or undo the emotional effects of negative life events, and increase psychological resiliency (Fredrickson, 1998; Fredrickson & Joiner, 2000; Fredrickson & Levenson, 1998). If one interprets interest and joy as components of good feeling or positive affect, Principle 1 gains the support of the extensive work of Isen and her colleagues (e.g., Isen, 1987; Isen & Daubman, 1984; Isen et al., 1987). They showed that the good feeling generated by receipt of attention or a little beneficence may enhance types of creativity and problem solving. Although interest and joy can become a part of maladaptive affective–cognitive structures and behavior, as in the case of extreme sensation seeking (Zuckerman, 1979), positive emotions typically bring positive benefits.

### *Interest*

One can readily infer from James's (1890/1950) work that in the absence of compelling negative emotion, interest produces selective perception and determines the cognitive organization of the experiential world (Izard, 1990b). In Darwin's (1872/1965) work, one can see the beginning of an understanding of the relations among emotions and the way that interest (as attention to novelty) has primacy in information processing. However, the work of Tomkins (1962), above all others, defined the positive emotion of interest–excitement and revealed its critical role in motivating and sustaining constructive endeavor. He argued that only the emotion of interest can sustain long-term productive activity. Theory and research that extended Tomkins's treatment of interest emphasized its role in human development, particularly its effectiveness in engaging the infant in the environment and motivating play behavior; it also showed that interest in the human face played a critical part in mother–infant interactions and the development of positive and supportive social bonds (Izard, 1977; Langsdorf, Izard, Rayias, & Hembree, 1983; Renninger, Hidi, & Krapp, 1992).

Others have elaborated and extended the early theoretical framework for studying the emotion of interest (Deci, 1992; Fredrickson, 1998; Ryan & Deci, 2000). The empirical work of these investigators and others (e.g., Deci, Vallerand, Pelletier, & Ryan, 1991; Renninger et al., 1992; Renninger & Wozniak, 1985) have demonstrated the positive effect of interest on exploration, learning, and productivity.

### *Joy*

The emotion of enjoyment–joy and its variant forms such as contentment and elevation have preventive efficacy and numerous benefits for mental and physical health and personal well-being

(Diener & Diener, 1996; Fredrickson, 1998; Haidt, 2000; Izard, 1977; Tomkins, 1962). The joy of achievement provides relief from long periods of intense interest-driven work (Izard, 1977) and recuperative power for overcoming the stress of negative emotions (Lazarus, 1991). Perhaps the first instance of the smile of joy and its power to soothe occurs when a distressed young infant smiles and takes comfort in the recognition of his or her mother's smiling face (Kagan, 1971; Izard, 1978), a process that represents a cognitive or affective–cognitive achievement for the young infant.

The presence of a form of smiling at birth and the indiscriminate and winsome social smiling of young infants before they can distinguish familiar from unfamiliar faces testify to the fundamental significance of the smile for human social life (see Izard, 1977, for a review). Enjoyment, expressed frequently in the exchange of smiles in mother–infant interactions, undoubtedly plays a significant role in the development of the first social bond (attachment) and continues to provide motivation for positive interpersonal relationships throughout the life span (Izard & Ackerman, 1997). The secure attachment, in turn, provides infants a secure base from which they can explore and learn (Ainsworth et al., 1978; Bowlby, 1980). We could also explain the more proximal causes of such exploration and learning in terms of the direct effects of positive emotions: joy-generated confidence and courage and interest-generated engagement in the environment (Izard, 1977; cf. Myers, 1992). Positive emotions play a role in other close relationships. Shared fun characterizes friendships in children (Parker & Gottman, 1989) and correlates highly with commitment in married couples (Stanley, 1997). Whether explained in terms of secure attachment and its subsequent working models or in terms of feelings of interest and joy, the appreciation of someone's care and love may provide the surest way to enhance health and well-being and buffer the effects of negative life events (Aspinwall, 1998; Fredrickson, 2001; Izard, 1991).

### *The Interest–Joy Pattern*

Throughout the life span, the role of interest and joy as a pattern of emotions in play behavior, particularly in infancy and childhood, has particular relevance to the problem of translating emotion science into preventive interventions. Some have identified play as essential to the development and maintenance of primate social life (Jolly, 1966). Whereas interest engages and sustains the child in exploratory play and gamelike activities, joy provides the reward for the work of play that leads to the achievement of mastery and a variety of skills. Object play has substantial benefits for the development of fine motor and perceptual skills, rough and tumble play for gross motor skills, and pretend play, games with rules, and other social play for affective–cognitive skills associated with emotion knowledge and emotion regulation (Boulton & Smith, 1992; Dolhinow & Bishop, 1970; Izard, 1977; Jolly, 1966). The far-reaching effects of play in ontogeny led one affective neuroscientist to propose that play has a significant positive influence on the development of the brain and neural systems that serve affiliative and nurturant needs (Panksepp, 1986a, 1986b).

### *Implications of Principle 1: Positive Emotions Provide Key Psychological Resources*

Although beneficial effects of positive emotions can occur at any age, infancy may provide the optimal period for their influence

on development and effective adaptation. A mother's smile facilitates her infant's activities and play behavior, whereas her expression of sadness has the opposite effect (Termine & Izard, 1988). Infants' high emotional responsiveness and strong interest in the human face (Langsdorf et al., 1983) and biological motion (R. Fox & McDaniel, 1982) suggest that early infancy is a critical or highly sensitive period for gains in emotional development that derive from face-to-face play involving positive emotion expressions. Practice in face-to-face play helps infants pass their first developmental task: acquiring the ability to participate in synchronized dyadic interactions (Tronick & Gianino, 1986; Weinberg & Tronick, 1994). Face-to-face play including synchronized positive emotion expressions together with warm and sensitive emotional responsiveness also helps infants succeed with an important developmental task, that of establishing a reliable social bond or secure attachment (Isabella & Belsky, 1991).

Evidence also suggests that prevention techniques for infants might well include the timely introduction of novel stimuli and challenging age-appropriate tasks to capitalize on interest motivation and engage the infant in the physical environment. For older infants and young children, such tasks might also include simple games with easily achievable goals and success experiences that activate joy or positive motivation (Dweck, 1986; Izard, 1977; Lazarus, 1991).

Emotion science indicates that primary prevention programs for children should foster the learning of adaptive and socially responsible behavior through play, gamelike activities, and participative learning opportunities that children find interesting and enjoyable. Yet, reviews of existing school-based prevention programs (Bear et al., 2000; Durlak & Wells, 1997) reveal few that have a conceptual framework or systematic plan for inducing and sustaining discrete positive emotion feelings and capitalizing on their benefits. The relative neglect of positive emotions may result from a greater emphasis on self-control and the control of negative emotions than on the benefits of positive emotion feelings. The emphasis on control of negative emotions overlooks the possibility that the frequent induction of positive emotions not only enhances personal well-being (Diener, Sandvik, & Pavot, 1991) but also may prove a superior method for regulating and mitigating negative emotions and their ill effects on self-control (Fredrickson, 2000, 2001; Izard, 1977; Lazarus, 1991). Deepening our knowledge of positive emotion feelings at the neural, behavioral, and subjective levels and finding better ways to understand, manage, and utilize them may represent the greatest remaining challenge for researchers in emotion science and preventive intervention (Fredrickson, 1998; Izard, 1977).

#### *Applications of Principle 1: Positive Emotion Induction and Utilization in Preventive Interventions*

Although many prevention researchers do not discuss the induction and utilization of discrete positive emotions (interest, joy) as explicit goals, a number of them describe significant program goals in global terms such as *secure attachment*, *positive emotional climate*, *prosocial orientation*, *values*, and *caring community* (Solomon, Battistich, Watson, Schaps, & Lewis, 2000). These terms relate conceptually to the discrete positive emotions.

Several intervention programs aim to correct or prevent insecure attachment by increasing mothers' emotional availability and re-

sponsiveness to the infant's needs. They often succeed in obtaining a number of positive outcomes such as decreasing mothers' stress and improving their mood, positive emotion expression, and sensitivity to their infants (Cooper & Murray, 1997; van IJzendoorn et al., 1995). These outcomes and the related intervention activities seem congruent with the principle of positive emotion induction and utilization.

The authors of a school-based empathy training intervention (Feshbach, 1983) conceived it as a program that would help create a positive emotional atmosphere and a caring attitude. Well-validated programs with a strong emphasis on empathy and prosocial behavior include activities (e.g., cooperative learning) that children enjoy (Solomon, Watson, Schaps, Battistich, & Solomon, 1990). Activities such as cooperative learning appear to contribute to a sense of belonging to a caring group, an experience that undoubtedly increases the frequency of positive emotions (Solomon, Watson, Battistich, Schaps, & Delucchi, 1992).

Some validated prevention programs for young children give many of their techniques a gamelike nature to make them interesting and enjoyable (e.g., I can Problem Solve [ICPS]; Shure, 1993). Positive emotion induction and utilization undoubtedly occur in other established programs that facilitate mutual concern and respect to promote the development of a caring community and use a "buddy system" to increase helping behavior or skills training relating to friendship (e.g., Promoting Alternative Thinking Strategies [PATHS]; M. T. Greenberg & Kusche, 1993; Child Development Project [CDP], Solomon, Watson, et al., 1992).

Though not stated as an explicit goal, use of gamelike techniques and techniques that foster friendship building and a caring community suggest that positive emotion induction and utilization apparently contribute to the benefits of a number of preventive interventions. Increasing positive emotion expressions and feelings may well prove the primary factor in the success of attachment interventions and a very significant one in school-based programs such as CDP. In any case, the growing literature on the benefits of positive emotions for health and well-being and their apparent contribution to interventions suggest the need for program evaluation research that provides specific tests of hypotheses relating to Principle 1.

#### *Principle 2: Negative Emotions Influence Learning and Memory, and Certain Negative Emotions Provide the Basis for Empathy and Prosocial Behavior*

Freud's (1938) psychodynamic theory argues that early learning results in strong learning and long-lasting effects. The early learning that interested Freud occurs in an affective context of intrapsychic or interpersonal conflict fraught with negative emotions. Freud and his successors supported this idea mainly with individual case histories and notes from psychoanalysis, but experimental evidence from other traditions proved consistent with their position. Although an extensive review of behavioral research on emotion, arousal, learning, and memory revealed a highly complex set of relations among these phenomena, the evidence shows that emotion enhances memory for the central aspects of an event, as well as the details associated with central material (Heuer & Reisberg, 1992). People do not remember everything in an emotional situation, but what they remember is remembered well and

more slowly forgotten (LeDoux, 1996; LeDoux, Romanski, & Xagoraris, 1989).

### *Chemical Induction of Arousal and Memory*

Psychopharmacological studies of negative emotional arousal and cognition in humans support the hypothesis that emotion enhances learning and memory (Cahill & McGaugh, 1998). For example, Cahill, Prins, Weber, and McGaugh (1994) used a  $\beta$ -blocker (propranolol hydrochloride) to block the activation of  $\beta$ -adrenergic receptors in participants who listened to an emotionally arousing story. Their later tests comparing experimental and control participants' memory for story material confirmed the hypothesis that arousal due to adrenergic stress hormones (and not due simply to the cognitive awareness of a tragic event) plays a key role in memory for emotional situations. The  $\beta$ -blocker (and reduction of arousal) significantly reduced learning and memory for emotion-related material (Cahill et al., 1994).

### *Inductive Discipline, Emotion Arousal, and Empathy*

Although arousal of any negative emotion may provide the basis for strong learning, the induction and utilization of the emotions relating to empathy, sympathy, and prosocial behavior have the greatest relevance for preventive interventions. Perhaps the most relevant evidence for the utility of negative emotions in prevention programs comes from a line of research that began with studies of types of parental discipline as they relate to moral behavior and the internalization of standards of conduct (Krevans & Gibbs, 1996). The research revealed positive outcomes for the vicarious experience of certain negative emotions produced by parents' use of inductive discipline as opposed to discipline based on power assertion and love withdrawal. Inductive discipline and the accompanying induction of emotion feelings requires that parents provide children with a cognitive framework that fosters taking the perspective of the other and interpreting social events in emotional terms.

The theory that inspired this line of research proposes that inducing a child to take the perspective of his or her victim would activate the emotions involved in empathy and sympathy, which in turn mediate subsequent prosocial behavior (Hoffman, 1963). This theory identifies the key causal processes of empathy and prosocial behavior in terms of discrete emotion feelings such as sadness over the plight of another, guilt over one's unfair acts, or anticipation of guilt feelings for failure to provide help to the victim (Hoffman, 1976). Significant relations exist between the several constructs in Hoffman's (1976) theory: inductive or other-oriented discipline and empathy (Eisenberg et al., 1992; Miller, Eisenberg, Fabes, Shell, & Gular, 1989; White, Walsh, & Gibbs, 1988), inductive discipline and prosocial behavior (Dlugokinski & Firestone, 1974; Hoffman & Salzstein, 1967; Zahn-Waxler, Radke-Yarrow, & King, 1979), and empathy and prosocial orientation (Eisenberg & Miller, 1987; Lennon, Eisenberg, & Carroll, 1986; Strayer & Schroeder, 1989). Although some have argued that the effects of any type of parental discipline might vary across contexts (Grusec & Goodnow, 1994), the weight of the evidence favors inductive discipline and the induction of the discrete negative emotions involved in empathy and sympathy as a means of fostering the internalization of moral standards and the development of proso-

cial orientation and behavior (Bear & Rys, 1994; Eisenberg & Strayer, 1987; Hoffman, 1975; Hoffman & Thompson, 1980). Of particular importance to Principle 2, one study went beyond testing components of Hoffman's (1976) theory and confirmed his core hypothesis that empathy mediates the effects of inductive discipline on children's prosocial behavior (Krevans & Gibbs, 1996).

### *Implications of Principle 2: Emotion Experiences, Learning, and the Process of Change*

The theory and research relating to Principle 2 suggest that prevention programs may benefit from emotion induction as it relates to empathy training techniques. Empathy training should benefit from techniques that heighten awareness of empathic emotion states, their phenomenology, and their specific motivational characteristics. However, heightened awareness of emotion states and emotion motivation is not enough. Behavioral change and the development of prosocial behavior requires that children regulate their emotion arousal (Eisenberg et al., 1996) and practice making connections between empathy-related emotion states and socially responsible behavior. Applying techniques (e.g., pretend play, role play, and other socially interactive games) that involve emotion-perspective taking, empathy, and altruistic acts helps children develop necessary connections between motivational feeling states and socially responsible actions (Feshbach & Feshbach, 1982; Hoffman, 2000).

Techniques that focus on the vicarious emotions that derive from consideration of others' feelings become more critical in the latter part of the preschool years, as peer relations achieve a bigger place in personal well-being and social adjustment. Successful application of empathy-related techniques help the preschool child pass an important developmental task of this period: increasing one's understanding of others (Eisenberg & Fabes, 1998; Hoffman, 2000).

Successful application of preschool prevention techniques that foster empathy and the utilization of the motivation derived from appropriate and modulated vicarious emotions help lay the foundation for emotion and empathy-based sociomoral behavior (Bear, Richards, & Gibbs, 1997; Eisenberg & Fabes, 1998; Hoffman, 2000). Evidence suggests that even 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-Berg & Hand, 1979). Gains in empathic responding and moral reasoning may help children pass another important developmental task of the preschool period: increasing the ability to conceptualize and manage the emerging self-conscious or self-evaluative emotions that include guilt and shame and more complex affective-cognitive structures like pride, envy, and jealousy (Abe & Izard, 1999b). In addition to fostering altruistic socially responsible behavior, induction of empathy-related emotions provides a meaningful opportunity to learn to discriminate among certain negative emotion feelings, acquire accurate labels that symbolize them in consciousness, and improve the ability to discuss and deepen understanding of their causes and motivational features (L. S. Greenberg & Paivio, 1997; Izard, 1971).

*Emotions and social skills.* Because the negative emotion feelings involved in empathy and sympathy provide the meaning and motivation for ethical and moral reasoning and socially responsi-

ble behavior in morally challenging situations (Eisenberg & Fabes, 1998; Hoffman, 2000), they should play a prominent part in the teaching and learning of social skills. Empathic sadness (for the victim) and the direct experience of guilt (for own wrongdoing or failure to act) provide the motivation for immediate reparation and helping behavior and the key to enhancing the development of patterns of adaptive prosocial behavior (Eisenberg & Fabes, 1998; Izard, 1991). As children develop in prosocial orientation and increase their consideration of the feelings of others, the acceptance of responsibility for one's actions tends to replace denial of wrongdoing and blame directed toward others. In addition to emotion inductions relating to moral reasoning and misconduct or wrongdoing, training parents and teachers to include discussion of emotions, particularly empathy-related emotions, in "preachings" and explanations of behavior in everyday contexts (not involving wrongdoing or discipline) can increase children's emotion-perspective taking, empathy, and altruistic behavior (Dunn, Bretherton, & Munn, 1987; Eisenberg-Berg & Geisheker, 1979).

A strong and consistent emphasis on the role of empathic emotions in teaching social skills would provide an alternative or addition to the dominant social-cognitive position on learning to solve interpersonal problems by learning how to think (M. T. Greenberg & Kusche, 1993; Spivack & Shure, 1982). Emotion theory and research suggest that in ethically and morally challenging situations, one might need to practice emotion-perspective taking and the sharing of emotion experiences vicariously to learn how to feel.

*Empathy and the reduction of aggression.* In addition to the direct benefits of emotion induction and emotion-perspective taking on positive social behavior, the empathic tendencies that they foster serve as a protective factor against interpersonal aggression. A number of studies have revealed that children who score high on empathy engage in less aggression (Staub, 1986) and in more prosocial behavior (see Eisenberg & Fabes, 1998, for a review).

The theory and research relating to Principle 2 does not imply that teachers of school-based prevention programs should use inductive discipline routinely. Principle 2 does imply that use of role play and other social and emotion-perspective-taking techniques may be a safe and productive way to help children gain the benefits of the induction of the emotions involved in empathy and prosocial behavior (M. T. Greenberg & Kusche, 1993; Kusche & Greenberg, 1994).

### *Applications of Principle 2: Emotion Induction in Preventive Interventions*

The authors of an early developed affective education program (Feshbach, 1983; Feshbach & Feshbach, 1982) that emphasized empathy and a prosocial orientation assumed that teaching children to understand their own emotions and, equally important, the emotions of others would increase empathic responding, prosocial behavior, and social competence. They used techniques such as emotion recognition, stories, songs, vignettes, and exercises in perspective taking and role play to help children achieve the goals of the program. They reported that their program increased understanding of the other's point of view and prosocial behavior and that the vicarious affective response of empathy served as an inhibitor of aggressive inclinations (Feshbach & Feshbach, 1982). Other evaluations of brief implementations of the affective educa-

tion program revealed modest short-term gains in kindergarten children's understanding of emotions (Feshbach & Cohen, 1988) and more positive self-evaluations in third- and fourth-grade children (Feshbach, 1979; Feshbach & Feshbach, 1982).

The original empathy training and affective education program did not receive extensive implementations or evaluations. However, many subsequent programs incorporated aspects of the philosophy and content of the empathy training and affective education approach. One prevention researcher who worked extensively with aggressive and delinquent adolescents concluded that social skills training and activities to increase the level of sociomoral reasoning and prosocial behavior may prove ineffective without empathy training (Gibbs, 1987; Gibbs, Arnold, Ahlborn, & Cheesman, 1984; Gibbs, Potter, Barriga, & Liao, 1996).

CDP has significant components for promoting empathy and prosocial values, ethical and moral development, and enhancing the likelihood that children will experience their classroom and school as a caring community (Solomon, Watson, Delucchi, Schaps, & Battistich, 1988). The authors of CDP (Solomon, Schaps, et al., 1992) saw the social context of the school as critical in meeting students' needs of belonging to a social group, having age-appropriate opportunities to express their autonomy, and feeling competent and effective. They argued that the school environment should enable students to experience caring and supportive relationships with peers and adults and to participate in significant decision making concerning their learning and in planning and norm setting. They held that sensing the classroom and school as caring communities depends on a feeling of belonging and shared emotional connections that are based on common goals and values, as well as on spiritual bonds (Solomon et al., 1996).

Many school systems have adopted and implemented CDP, and investigators have subjected it to extensive evaluations that attest to its validity. (For an example and list of references, see Solomon et al., 2000). A recent large-scale implementation and longitudinal evaluation of CDP found that it had significant positive effects on students' personal, social, and ethical attitudes, values, and motives (Solomon et al., 2000). The authors of a recent review (Bear et al., 2000) identified CDP as a model school-based program for the prevention of violence.

CDP does not address emotion concepts explicitly, but it has components that seem quite consistent with aspects of differential emotions theory and the application of Principle 2. They attribute the theoretical and empirical foundations of CDP to early work on the origins of empathy and prosocial behavior in children (e.g., Mussen & Eisenberg-Berg, 1977; Staub, 1979). CDP's emphasis on the idea of a caring community implies positive emotion expression and a positive emotional climate. In the context of a positive emotional climate and a caring community, the CDP program engages children in cooperative learning. Cooperative learning provides opportunities for sharing emotion experiences and developing emotion communication skills that may contribute to the development of empathy and prosocial behavior. The promotion of nonexclusionary attitudes may also promote empathy as well as diminish contempt due to perception of ethnic or religious differences (Jules, 1991). One can only speculate about the possible advantages that CDP might accrue from the addition of an emphasis on understanding and utilizing the motivation stemming from the discrete emotions.

That the addition of specific emotion constructs may help is suggested by their use in other successful prevention programs (e.g., PATHS). Although PATHS has a strong emphasis on promoting thinking strategies, it also deals with the specific emotions involved in empathy. PATHS also encourages teachers to help children make appropriate use of justified guilt to motivate prosocial and moral behavior.

At least one program, the Anger Coping Program (Lochman & Lenhart, 1993), uses an induction technique to activate an emotion other than those usually involved in empathy, prosocial behavior, and moral development (Lochman, Lampron, Gemmer, & Harris, 1987). This program is based on cognitive-behavioral theory and the social information processing model of hostile attribution (Crick & Dodge, 1994; Dodge & Coie, 1987). In one of several techniques of the Anger Coping Program that targets small groups of highly aggressive children, peers take turns taunting each other to elicit anger in the target child. During the anger arousal, the child is instructed in the use of self-talk and other anger-control techniques. The authors conceived of the technique as giving children practice at managing real anger in a safe environment. The goal is to give children opportunities to learn to modulate anger on-line and use it constructively in self-assertion and negotiation. In one well-designed study (Lochman & Lenhart, 1993) of 76 aggressive boys (age 9–12 years), the Anger Coping Program (completed in 12 weekly 45–60 min sessions) significantly exceeded comparison and control groups in reducing aggressive behavior as rated by parents (but not as rated by teachers). The program also tended to increase participants' ratings of self-esteem. Thus, the program as a whole achieved some positive results, but the authors noted its limitations (and that of other programs) in changing behavior patterns in chronically aggressive children.

### *Principle 3: Modulated Emotion Expression Mediates Emotion Utilization*

Although young infants show uncontrolled expression of physical distress and anger to unanticipated pain (e.g., inoculation), by the time they reach 1.5 years of age they exhibit regulatory ability (Izard, Hembree, Dougherty, & Spizzirri, 1983). Between 1.8 and 2.8 years, children significantly increase their effortful control—that is, the ability to slow down motor activity, focus attention, initiate social signals, and lower voice—and greater effortful control at 1.8 years relates to more expressions of joy and more regulated anger (Kochanska, Murray, & Harlan, 2000).

Infants and young children show individual differences in their ability to regulate emotion arousal and expression, and they exhibit some stability over time in their style (frequency, intensity) of emotion expression (Hyson & Izard, 1985; Izard, Hembree, & Huebner, 1987). Undercontrolled toddlers who fail to acquire effective regulatory techniques and frequently express negative emotions tend to have negative personality traits—high neuroticism, low agreeableness—at age 3.5 years (Abe & Izard, 1999b). Socially inhibited toddlers show inhibited behavior with peers and express less positive emotion in fantasy play at age 5 years (Kochanska & Radke-Yarrow, 1992).

Because expressive behavior relates to traits of personality (Abe & Izard, 1999b) and because genes account for a substantial portion of the variance in such traits (Plomin, 1994), it seems

reasonable to assume that genes account for a significant part of the variance in emotion expression styles. Yet, socialization and social learning also influence the development of expressive behavior. Parents who accept, rather than reject or dismiss, their children's expressions of emotions are more likely to have children who use modulated emotion expression (Gottman, Katz, & Hooven, 1997). Individual and social benefits accrue from moderate expressiveness and a modulated emotion expression style. Both nonexpression and intense expression (e.g., venting) increase the risk of negative behavioral outcomes (for a review, see Kennedy-Moore & Watson, 1999).

### *Controlled Expression and the Utilization of Emotion Motivation*

The capacity of modulated emotions to mobilize energy and organize and motivate cognition and action is a key factor in their adaptiveness (Hamburg, 1963; Izard, 1991; Izard & Ackerman, 2000; Plutchik, 1980; cf. Campos et al., 1994; Mayer & Salovey, 1997). In at least some circumstances, empathy and prosocial behavior depend on the ability to keep emotion arousal and emotion expression at a moderate level (Eisenberg et al., 1996). Controlled expressions help facilitate the constructive utilization of the energy and motivation of emotion arousal by modulating interactions with the social and physical environment; for example, talking instead of screaming would enable the utilization of the communicative functions of emotions (Gellhorn, 1964; Izard, 1971; Izard & Bear, 1999; Izard et al., 1987; Kennedy-Moore & Watson, 1999; Polivy, 1998).

### *Emotion Utilization and “Emotional Intelligence”*

The conceptualization of emotions and emotion utilization in Principles 1, 2, and 3 differ from their meaning in the literature on emotional intelligence in two ways. First, Mayer and Salovey (1997) argued that socioemotional competencies stem from a special kind of intelligence, emotional intelligence. Second, they defined motivation in terms of “biological urges or learned goal-seeking behavior. To the extent that it is involved in emotional intelligence, it should be thought of as secondary” (p. 4). In contrast, differential emotions theorists explain emotions as primary motivational systems and their utilization as the processes that capitalize on the inherently adaptive functions of emotions, including their unique motivational capacities (Izard, 1971; Izard & Ackerman, 2000). They argued that socioemotional competencies derive mainly from the emotion systems and their direct effects on cognition and action (Izard, 2000).

### *Implications of Principle 3: Emotion Modulation and Emotion Utilization*

Theory and research relating to Principle 3 suggest a new organizing concept for regulating intense emotion: the modulation (not the stopping or suppression) of emotion and emotion-related activity and the redirection and constructive utilization of the emotion energy and motivation. This conception of emotion utilization implies that one should modulate then harness and utilize the arousal-generated energy to respond with acceptable action to the emotion motivation.



Since Laird's (1974) classic study of experimentally manipulated emotion expressions, more than 30 experiments have suggested that controlling emotion expression may contribute to the control of the concomitant emotion feeling. A chief criticism of these studies, still not answered to the satisfaction of all the critics, relates to their demand characteristics and the possibility that the purpose of the manipulation leaks to the subjects and influences their responses. (For reviews and critiques of these studies, see Izard, 1990a; Matsumoto, 1987; Zajonc, Murphy, & Inglehart, 1989). However, for purposes of therapeutic or preventive interventions designed to facilitate emotion regulation and the accompanying benefits of controlled expression, it really does not matter that one has a cognitive factor in addition to a neuromuscular or vascular feedback effect (Gellhorn, 1964; Izard, 1977; Tomkins, 1962; Zajonc, 1980) contributing to the change in emotion arousal and emotion feelings. Indeed, teaching children to modulate their facial and vocal expressions as a means of modulating their emotion feelings, would mean deliberately taking advantage of complementary cognitive techniques such as self-coaching, imagery, reappraisal, and consideration of the social consequences of intense or extreme expressions.

*Modulated expression versus venting and overcontrol.* Mild to moderate emotion expression can have positive benefits, especially when carefully orchestrated with affective-cognitive restructuring. In contrast, venting generally has negative effects, including the possibility of increasing emotion arousal and the intensity of emotion experience, lowering negative emotion thresholds, and forming maladaptive behavior patterns. (For a full discussion of the advantages of controlled expression over venting, see Kennedy-Moore & Watson, 1999; Polivy, 1998). The popular notions about the benefits of uncontrolled emotion expression or venting are myths. Proponents of the venting hypothesis assume that the intensity of expressive behavior has a simple linear and inverse relation to emotion arousal and experience. Substantial evidence runs counter to this assumption. Expression may represent a readout of physiological arousal, amplify or attenuate arousal, or change independently of arousal (Gross, 1999; Kennedy-Moore & Watson, 1999). Similarly, emotion expression may reflect emotion experience, amplify or attenuate it, or change completely independently of it (Ekman & Friesen, 1982; Izard, 1977). Moreover, the same intensity of arousal may accompany different intensities of expression and levels of self-reported feeling in different individuals (Blascovich, 1992; Katkin, 1984).

Emotion control, particularly anger control, occupies a central place in a number of prevention programs. Sometimes prevention programs emphasize control without caveats about overcontrol (Block & Kremen, 1996; Kennedy-Moore & Watson, 1999) or attention to the potential utilization of modulated anger arousal (L. S. Greenberg & Paivio, 1997). Principle 3 suggests that although anger activation in children increases the risk of disruptive or aggressive behavior, when modulated it also provides the opportunity to learn how to utilize the energy and motivation of modulated anger arousal constructively. Research with adults shows that angry encounters can result in positive long-term changes that include becoming aware of one's own faults and strengths, gaining respect for the angry person, and strengthening one's relationship with the angry person (Averill, 1983).

*Managing intense emotions on-line.* For managing emotions on-line, Principle 3 suggests that young children, particularly those

high in impulsivity and low in effortful control (Rothbart, Ahadi, & Evans, 2000), be taught to manage intense anger activation with emotion-focused techniques. Such techniques should help children react to real anger in social situations without resorting to aggression (Lochman & Lenhart, 1993). Principle 3 suggests that for young impulsive children, the prototypical technique for managing intense anger on-line begins with a benign moderate activity that captures and modulates the anger action tendency and then redirects it toward appropriate self-assertion and negotiation. Once children have redirected the emotion motivation (e.g., anger) into constructive or harmless physical activity, they can begin the critically important task of connecting the modulated anger to the appropriate cognition and behavior involved in negotiation (M. T. Greenberg & Kusche, 1993; Kusche & Greenberg, 1994).

Older children apparently achieve good results in anger management with proactive cognitive-behavioral techniques such as those based on the stop signal metaphor (e.g., M. T. Greenberg, Kusche, Cook, & Quamma, 1995), described later. However, the theory and research relating to Principle 3 suggest that in helping young children learn to manage intense anger on-line, these techniques may benefit from more emphasis on the concept of optimum control (Block & Kremen, 1996) and increased integration of anger modulation and constructive utilization of the energy and motivation of modulated anger arousal (Lochman & Lenhart, 1993).

Modulation and utilization of other emotions can also contribute to anger management. In the toddler-preschool period, shame and guilt emerge as possible mechanisms for the self-regulation of anger (Abe & Izard, 1999b). Modulated sadness (over the plight of the other child) or role-play-induced anticipatory guilt (for intending to hurt or for not helping someone in distress) may produce empathy that counteracts undercontrolled anger and aggression (Eisenberg & Miller, 1987; Hoffman, 2000; Staub, 1986).

Helping children learn to modulate shame induced by bullying, memories of victimization, or public failure may enable a child to take advantage of a safe environment (a caring teacher and positive classroom climate) to use the emotion motivation from shame memories and shame anticipation to motivate the acquisition of skills and competencies that render the self less vulnerable (M. T. Greenberg et al., 1995, PATHS, grade 1, Lesson 25; Izard, 1977; H. Lewis, 1971; M. Lewis, 1993; M. Lewis et al., 1989; Tomkins, 1963). Such emotion utilization may contribute to extraordinary individual endeavors.

### *Applications of Principle 3: Emotion Modulation and Utilization in Preventive Intervention*

PATHS includes techniques for facilitating controlled emotion expression (more specifically, techniques for calming down before engaging in verbal expression). From the opening lessons to the end-of-year PATHS party, teachers frequently remind children to take the three steps for calming down: Stop, take a long deep breath, and say the problem and how you feel (Kusche & Greenberg, 1994). In implementing PATHS, teachers help children understand that all feelings provide useful information that can guide constructive thought and action (Kusche & Greenberg, 1994). The authors of PATHS (M. T. Greenberg & Kusche, 1993) interpreted their strong emphasis on self-control as congruent with the notion of emotion modulation. They also interpreted the PATHS lessons

on how children can learn to detect emotion signals, mask emotions, and change their own emotions states as contributing to emotion modulation and utilization.

Although PATHS may provide the best examples of the application of Principle 3, emotion modulation as a mediator of emotion utilization is not a strong or consistent emphasis in the program. They endorse as OK some anger-related venting behavior—punching a bag or pillow, tearing up old newspapers, screaming loudly when alone (grade 1, lesson 52)—that research suggests may prove maladaptive (for a review, see Kennedy-Moore & Watson, 1999). These venting activities may actually increase anger arousal and aggression. They may also promote the notion that all negative emotions “are things to get rid of” (Kennedy-Moore & Watson, 1999, p. 60).

#### *Principle 4: Emotions Activated or Sustained by Different Processes May Require Different Regulatory Techniques*

For centuries, philosophers and scientists have written about two major sources of emotion: predisposition (biological and genetic factors) and cognition (including sociocultural and linguistic factors). The continuity in aspects of human thought about dispositional (noncognitive) and cognitive antecedents of emotion makes a rather powerful argument for their validity (Kagan, 1994a). Recent theory and research have defined a multisystem model of emotion activation that includes both cognitive and noncognitive processes (Izard, 1993). These two broad types of emotion activation differ on temporal and other dimensions, and they have different implications for preventive interventions, particularly in training parents, teachers, and intervention staff.

#### *Noncognitive and Nonconscious Processes in Emotion Activation*

From the time of Hippocrates (c. 460–370 B.C.E.) and Galen (129–199 C.E.), philosophers and scientists have observed that our biological constitution contributes to our characteristic mood, whether sanguine or melancholy, and the related personality traits of extroversion and introversion. A very substantial body of empirical evidence from contemporary science generally confirms the ancient wisdom related to these issues (Izard, 1993; Kagan, 1994a).

About 1700 years after Galen’s observations on predisposition or temperament, Hume (1739/1972), in the midst of the Age of Reason, argued that certain sentiments (emotional phenomena) like sympathy are universal (dispositional) qualities of human nature. More pointedly than the classical philosophers before him, he argued that the emotions, not reason, drive ethical and moral behavior. In particular, he maintained that the universal sentiment of sympathy counteracts self-interest and motivates constructive prosocial behavior.

A large body of contemporary research is generally consistent with ancient wisdom in showing relations between temperament and emotion experience. For example, investigators have identified children who are dispositionally shy or fearful (Kagan, Reznick, & Snidman, 1987) or anger prone (Dodge, 1985), as well as those whose negative emotionality creates chronic difficulty in behavioral and attentional control (Rothbart, 1989).

In addition to emotions or moods generated or sustained by biogenetic processes, other nonconscious processes, some of which do not involve higher order cognition, give rise to emotions. The simple perception and subcortically mediated evaluation of a tone previously paired with a painful stimulus can activate conditioned fear responses in the absence of the auditory cortex and hence without cortical processing and higher order cognition (LeDoux, Sakaguchi, Iwata, & Reis, 1986; LeDoux, Sakaguchi, & Reis, 1984). LeDoux (1996) argued that activation of fear requires only simple perception of the gross features of a conditioned stimulus.

LeDoux and his colleagues (LeDoux et al., 1984, 1986), as well as Davis and his colleagues (e.g., Campeau & Davis, 1995), have produced incontrovertible evidence that rats can show fear conditioning to both auditory and visual stimuli without benefit of a functional auditory or visual cortex, respectively. LeDoux (1996) called this thalamoamygdala neural circuit the “low road to emotion” (p. 164) and showed that valenced information traverses the low road rapidly, automatically, and nonconsciously. Furthermore, when learning occurs through the thalamoamygdala pathway and without involvement of neocortex or cortical processing, it produces longlasting memories that resist extinction (LeDoux et al., 1989).

Theoretical argument (Rosen & Schulkin, 1997) as well as data from brain-injured patients (Bechara et al., 1995) support the notion that LeDoux’s (1996) model generalizes to humans. The data showed that a patient with bilateral damage to the amygdala failed to acquire a conditioned autonomic response to an unconditioned stimulus (US), an aversive (100 dB) sound, but succeeded in learning the declarative facts about a conditioned visual stimulus when paired with the US. Patients with bilateral hippocampal lesions showed the opposite; they acquired the conditioned autonomic response but failed to learn the declarative facts. Psychophysiological research with non-brain-injured adult humans also shows that a stimulus can activate autonomic and behavioral signs of emotion rapidly, automatically, and nonconsciously (Dimberg, Thunberg, & Elmehed, 2000). The concept of a nonconscious activation process or a *low road* (thalamoamygdala pathway) to emotion offers a way of explaining emotion feelings that emerge in consciousness without labels or connections to language.

Since Darwin (1872/1965), theorists have argued that rapid or automatic emotion activation provides an adaptive advantage in the face of certain serious environmental challenges precisely because the resulting arousal can motivate a more or less instant reaction to the stimulus (Ackerman et al., 1998; Izard, 1977; Plutchik, 1980; Zajonc, 1980). However, rapid reactions to non-cognitively and nonconsciously activated emotions may include impulsive aggression, panic, or fear reactions to harmless objects and hence prove problematic.

*Cognitive processes in emotion activation.* The earliest records of human affairs (e.g., Homer’s *Iliad*, c. 10,000 B.C.E.) make it plain that cognitive processes—what one perceives and what one thinks—can activate emotions and influence the course of subsequent cognition and action. Aristotle (384–322 B.C.E.) elaborated a sophisticated theory of emotions that bears a great deal of similarity to contemporary cognitive and social-cognitive approaches. He proposed quite specific relations between certain appraisals or evaluations and particular emotions (McKeon, 1941). Of particular relevance to points discussed later in this article,

Aristotle included some of the basic negative emotions in his classical list of virtues and, as Hume (1739/1972) did later, described how they could motivate ethical and moral behavior.

Beginning with Arnold (1968), 20th-century psychologists have developed a number of theories about the cognitive appraisal and attributional processes that precede and activate emotions (Lazarus, 1991; Scherer, 1988; Smith & Ellsworth, 1985; Weiner, 1985). Researchers have also proposed a social information processing model to explain the origin of hostile attributional biases in anger-prone children (Crick & Dodge, 1994; Dodge, 1985). This model serves as the theoretical basis for a number of interventions (e.g., Lochman, 1992). The model consists of five steps, each of which takes time. Thus, the emotion activating processes described in appraisal theories and information processing models require cortical processing, more in the way of cognition than simple perception, and more time than the emotions produced by noncognitive and nonconscious processes.

#### *Implications of Principle 4: Different Emotion Activation Processes, Different Regulatory Techniques*

The training of professionals who implement interventions, especially those for young children, should clearly distinguish between the different routes to emotion activation and their implications for emotion regulation. The low road to emotions crosses only a few synapses and requires only a few milliseconds (LeDoux, 1996). The nature of these rapid nonconscious emotion processes, especially in combination with temperamental factors relating to low emotion thresholds and impulsivity, raises questions about use of the “stop-and-think” cognitive-behavioral technique in dealing with intense on-line emotion in young impulsive children. This technique uses stop sign (traffic control signal) posters to help children learn that the first step toward anger control is to “STOP and think.” It is part of a number of successful school-based prevention programs (e.g., M. T. Greenberg & Kusche, 1993; Spivack & Shure, 1978; Weissberg, Caplan, & Bennetto, 1988; Weissberg & Gesten, 1982). The stop-and-think technique may work well in dealing with high-road emotions in relatively well-adjusted older children who are low on impulsivity and aggression but prove less effective for young aggressive children with poorly regulated emotions and high impulsivity.

Because appraisal and attributional processes represent an orderly sequence of rational processes that take time, they offer a bigger window of time for intervention. In many situations children have to evaluate the event or situation before they place blame or credit. In such situations, a number of cognitive-behavioral techniques might prove effective (see Bear et al., 2000, for a review), particularly if the techniques capitalize on appropriate emotion motivation. An example is training children to consider the feelings of others as they use cognitive restructuring in situations that they see as becoming progressively more provocative or frustrating. Such emotion-influenced reappraisal and affective-cognitive restructuring should help in regulating emotions produced by higher order cognitive processes.

#### *Applications of Principle 4: Types of Emotion Regulatory Techniques in Preventive Interventions*

Prevention researchers have not yet developed and tested the effectiveness of techniques based on Principle 4. The principle

suggests several possibilities relating to its application. First, the regulation of low-road emotions in toddlers and preschool children, particularly those prone to impulsive acts, may require special attention or targeted programs. Second, the training of those who implement such programs should include explanations of both high-road and low-road processes in emotion activation and discussion of child and environmental factors that might influence their use. Third, training should also concern practice in using emotion-focused techniques for dealing one-on-one with on-line emotion in the individual child. Such techniques should have two goals. The first goal is the reduction of anger arousal, as rapidly as possible, perhaps through a benign activity that uses some of the energy of the anger arousal. The second goal is the redirection of the remaining anger motivation and action tendency in a constructive activity such as appropriate self-assertion, consideration of the feelings and desires of others, and negotiation of a solution.

Current prevention programs' content and techniques relating to emotion regulation and self-control make no distinction between emotions activated through rapid and nonconscious processes by way of simple perception or minimal cognition (Izard, 1993; LeDoux, 1996) and those that involve complex appraisal and attributional processes (Scherer, 1988; Weiner, 1985). In neglecting Principle 4, the authors of prevention programs miss the opportunity to at least help those who implement the interventions become aware of the differences between cognitive processes that generate emotions and noncognitive nonconscious emotion activation. Attention to these different types of emotion activation may help teachers improve their understanding of individual differences in children's emotionality and emotion responsiveness.

#### *Principle 5: Emotion Patterns in States and Traits Create Complex Motivational Conditions and Challenges for Approaches to Emotion Modulation and Utilization*

The long-standing prominence of various forms of behavioral theories and their style of framing psychological problems in terms of stimulus-response associations may have inclined emotion researchers toward conceiving event-emotion sequences in singular terms—one event, one emotion. For decades, students of emotions have searched for a definable stimulus that would predictably produce a single emotion (Allport, 1924; Gross & Levenson, 1995). Literary and scientific descriptions of human experiences, as well as empirical research, suggest that such searches rarely if ever produce dependable answers (Scherer, 1994). Provocative or challenging stimuli, whether real or imagined, tend to produce multiple emotions (Bartlett & Izard, 1972). Both research and clinical observation indicate that co-occurring emotions form meaningful, nonrandom patterns and that each of the emotions in the pattern retains its unique experiential and motivational qualities (Izard et al., 2000; Izard & Youngstrom, 1996). The concept of emotion patterns as a source of multiple and dynamically interrelated motivational conditions promises to increase researchers' understanding of event-emotion-action sequences (Izard, 1972; Izard et al., 2000).

The concept of emotion patterns applies both to states elicited by discrete events and situations and to stable traits that characterize emotionality, temperament, and personality. The two types of emotion patterning dynamics (state and trait) interact in social exchanges and relationships (Derryberry & Rothbart, 1997; Eisen-

berg et al., 1995; Izard et al., 2000). Thus, in response to certain provocative events, a person dispositionally prone to experience shame and anger may experience these emotions at a higher level of intensity than would a person with a different disposition (H. Lewis, 1971; Tangney, Wagner, Barlow, Marschall, & Gramzow, 1996).

### *Event-Related Patterns of Emotions*

If asked to report their feelings while imagining a situation that elicits a particular emotion or while actually experiencing an emotion-eliciting event, people inevitably report a pattern of emotions (Izard, 1972). In both imagined and real emotion-eliciting situations, the following patterns of emotions frequently recur: interest and joy; sadness and anger; sadness and fear; guilt and fear; and anger, disgust, and contempt (Bartlett & Izard, 1972; Tomkins, 1962, 1963).

Beginning as early as age 7 years, children learn that a single event can cause two emotions. Over the next 3 or 4 years, they increase their understanding of co-occurring patterns of emotions (Harter & Buddin, 1987). The frequency of co-occurring emotions in older children means that they have to learn to contend with multiple motivational states that compete for information processing channels and motor pathways (Blumberg & Izard, 1985).

Patterns of emotions involved in self-evaluation and social comparisons relating to self-enhancement tend to increase in middle and late childhood (Ruble & Flett, 1988), as children experience profound changes in themselves and their social environment. They greatly increase the time they spend with peers (Ladd, 1996), experience a big increase in the amount of critical social and academic feedback about their performance and competencies (Higgins & Parsons, 1983), and may perceive an apparent decrease in parental affection and uncritical acceptance (Maccoby, 1984; Warton & Goodnow, 1991). These changes in behavioral ecology interact with the self-evaluative and social comparison processes of this period. These processes often involve patterns of self-conscious or self-evaluative emotions (shame and guilt) and the patterns of emotions and cognition that constitute the affective-cognitive phenomena of pride, envy, and jealousy (Gottman & Mettetal, 1986; Hartup, 1983; Larson & Richards, 1991, 1994; Ruble & Flett, 1988; Seidner, Stipek, & Feshbach, 1988). These patterns of emotions provide motivation in social interactions and in achieving the critical development milestones of peer acceptance and forming and maintaining friendships.

### *Patterns of Emotions and Emotion Traits*

Evidence suggests that individuals have characteristic thresholds for emotion activation, characteristic moods, emotion expression styles, and regulatory capacities and that recurring emotions or emotion patterns have traitlike status (Davidson, 2000; Diener & Diener, 1996; Eisenberg, Guthrie, et al., 1997; N. Fox, Henderson, Rubin, Calkins, & Schmidt, 2001; Goldsmith & Campos, 1982; Izard et al., 1987; Kennedy-Moore & Watson, 1999; Rothbart, 1989). The substantive as well as measurement models of emotionality, temperament, and personality overlap considerably (Ahadi, Rothbart, & Ye, 1993; Goldsmith & Campos, 1982; Izard et al., 2000; Rothbart, 1989; Rothbart et al., 2000; Smith & Lazarus, 1990). Current measures of temperament in infants and

children include scales for specific emotions such as sadness, anger, and fear, and in factor analyses these typically assemble as a secondary factor of negative emotionality, a traitlike pattern of negative emotions (Rothbart, 1981).

Before infants can make verbal reports of emotion experiences, they show individual differences in emotion expression that remain stable over time (Emde, Plomin, Robinson, & Corley, 1992; Hyson & Izard, 1985; Izard et al., 1987; Kochanska & Askan, 1995; Malatesta, Culver, Tesman, & Shepard, 1989; Rothbart, 1989). Patterns of negative emotions or emotionality have also appeared as stable factors in toddlers (Abe & Izard, 1999b), young children (Eisenberg et al., 1995), and in 6- to 7-year-old children in an American and Chinese sample (Ahadi et al., 1993). In late adolescence and adulthood, particular patterns of emotion experiences correspond with particular traits of personality. For example, interest and joy correlate with extroversion, and high negative emotionality correlates with neuroticism. Indeed, the construct of stable negative emotionality, based on a broad recurring pattern of negative emotions, may adequately describe the adult personality dimension of Neuroticism (Izard et al., 1993; Watson & Clark, 1992).

### *Patterns of Emotions, Temperament, and Behavioral Outcomes*

Numerous studies show that certain patterns of emotions and affective-cognitive structures represented in emotionality and temperament characterize particular forms of maladaptive behavior and may contribute to their development. Researchers describe extremely inhibited infants as shy and fearful (Kagan, Reznick, & Snidman, 1988), socially anxious children in terms of shame and fear (Beidel, 1998), depressed children in terms of a sadness-anger pattern (Blumberg & Izard, 1985), and aggressive or violent individuals in terms of a shame-anger pattern (Baumeister et al., 1996; Fabes & Eisenberg, 1992; H. Lewis, 1971; Schwartz & Proctor, 2000; Tangney et al., 1996; Tangney, Wagner, Fletcher, & Gramzow, 1992). Repeated bully-generated victimization may create a shame-anger pattern that eventually leads to outbursts of anger and aggression (Schwartz & Proctor, 2000). Repeated experiences of peer rejection have a similar effect. Peer rejection can also lead to internalizing or withdrawal behavior (Coie & Dodge, 1988; Coie, Dodge, & Kupersmidt, 1990), indicative of a pattern of emotions involving sadness, inner-directed anger, shame, and guilt (Blumberg & Izard, 1985; Izard, 1972; Izard & Schwartz, 1986).

Emotion traits and other temperament factors may operate interactively or as mediators or moderators in affecting adjustment and social behavior. A longitudinal study involving children from kindergarten through fifth grade showed that resiliency mediated the effect of emotion control on social functioning, and negative emotionality moderated the relation of behavior regulation to prosocial behavior (Eisenberg, Fabes, Guthrie, & Reiser, 2000). In adolescence, high levels of anger and high (but not low) impulsivity relate to delinquency, and high impulsivity and low positive emotionality relate to alcohol abuse and alcohol-related impairments in adolescents (Colder & Chassin, 1997; Colder & Stice, 1998).

### *Implications of Principle 5: Multiple Emotions, Multiple Motivational Conditions*

Evidence suggests that the patterning principle should guide the development of intervention techniques that address each of the prominent emotions in recurring patterns such as shame–anger, fear–shame, and sadness and inner-directed anger. Current prevention programs have done very little to address the issues relating to these critical patterns of emotions and their effects on social functioning and the development of behavior problems and psychopathology. Many anger control interventions neglect patterns by design (i.e., they focus on a single emotion) and thus may miss important causal processes in aggression and violence.

*Event-related emotion patterns and preventive intervention.* Despite their implications for normal and abnormal development, the emotion patterns that often characterize the self-evaluative and social comparison processes of middle and late childhood have generally not attracted much attention in preventive interventions. For example, no prevention program deals explicitly with one of the pernicious patterns that result from social comparison: the interpersonal pattern of contempt as expressed in children's acts of peer rejection and the victim's response of shame or shame→anger→aggression. Attention to this pattern becomes especially critical in middle childhood when expressions of contempt may surge as peer relations and social comparison become highly prominent. Preventive-intervention techniques in this period should increase awareness of the subtle forms of contempt that stem from perceived differences in ethnic, cultural, religious, and socioeconomic backgrounds. Such expressions of contempt amount to peer rejection or peer neglect (Izard, 1977, 1991; Jones, 1997). Such techniques should also encourage the development of norms against these forms of contempt and their consequences.

During middle and late childhood, emotion-centered preventive interventions should facilitate progress on developmental tasks relating to the self-conscious emotions and their roles in social comparison and self-identity. Prevention techniques should provide children opportunities to engage in social comparison without being unduly competitive or hurting others on the one hand or becoming unduly self-critical, withdrawn, or depressed on the other. Since Festinger's (1954) original analysis, a number of investigators have noted that social comparison can have positive effects, such as promoting achievement and task mastery, particularly in early childhood (Butler, 1989). Although social comparison in preschool children usually relates to achievement and task mastery, this use of it peaks in middle childhood (age 8 or 9 years), and then social comparison becomes more frequently related to self-enhancement (Ruble & Flett, 1988). Efforts at self-enhancement through social comparison may stem from shame or shame anticipation over perceived shortcomings or guilt over failures that are due to lack of effort.

Although some universal programs have lessons on self-conscious emotions like shame (e.g., PATHS, grade 1, lesson 25), some issues related to these emotions may require targeted interventions conducted or supervised by mental health professionals. This approach may be advisable for children whose use of social comparison has led to serious problems in peer relations, withdrawal, or depression. Such children may benefit from preventive techniques that help them understand the positive and negative effects of social comparison, the difference between blatant (usu-

ally negative) and subtle (potentially positive) social comparison (Pomerantz, Ruble, Frey, & Greulich, 1995). Prevention programs can provide the basis for such understanding within an emotion-theory framework by emphasizing emotion-perspective taking skills and other emotion-based skills (i.e., skills based on emotion motivation). These emotion-motivated skills should facilitate peer acceptance and friendship and minimize blatant social comparison, as should techniques that children can use to activate and sustain shared positive emotions (e.g., a buddy system as a framework for helping behavior; Solomon et al., 1990). One can teach social and cognitive skills such as those relating to social comparison in an emotion-theory framework by emphasizing emotion-perspective taking and considering the feelings of others, processes that may lead to increased empathy and prosocial behavior.

Prevention techniques that address issues relating to self evaluation and social comparison need to show sensitivity to the emergence of self-concepts and the task of achieving a higher level of self-identity and emotional maturity (E. Erickson, 1950; Harter, 1986; Marcia, 1966). Achieving these goals would entail increasing children's awareness and acceptance of individual as well as cultural and ethnic differences by helping them to engage in higher levels of emotion-perspective taking (Hoffman, 2000).

*Patterns of emotions in temperament and preventive intervention.* Research has not demonstrated the practicality or effectiveness of tailoring school-based intervention programs to temperament types or emotionality factors. Yet, research does support the notion that the training of those who implement prevention programs should help them understand that they do not need to view emotionality and temperament characteristics as unyielding to interventions. Since the early studies of individual differences in infants and children, scientists have observed both continuity and change (e.g., Kagan, 1971). Genes exert a powerful influence on the development and stability of traits of temperament and personality, but "there is no pure temperament that transcends all rearing environments" (Kagan, 1994a, p. 36). A number of lines of research show that temperament changes with development and in response to a number of factors that may yield to intervention.

Cross-fostering shy–fearful and sociable infant monkeys with mothers of contrasting temperaments showed that a mother's temperament greatly influenced the socioemotional phenotype of her adopted infant. For example, shy–fearful infants tended to become extroverted when reared by a sociable mother (Suomi, 1987). Similar experiments also show that characteristics of maternal care can affect the development of stress reactivity and trait fearfulness in rats (Francis, Diorio, Lui, & Meaney, 1999). In human development, the critical temperamental factor of effortful control (Rothbart, Ahadi, & Hershey, 1994) apparently changes as a function, in part, of maternal responsiveness, and in turn, effortful control predicts emotion and behavior regulation (Kochanska et al., 2000). Similarly, parental emotion coaching to increase children's emotion awareness and freedom to engage in modulated emotion expression relates positively to child regulatory physiology and emotion regulation in children 5 to 8 years of age (Gottman, Katz, & Hooven, 1996; Hooven, Gottman, & Katz, 1995; Katz, Gottman, & Hooven, 1996), suggesting that type of emotion socialization may influence temperament-related processes.

Longitudinal studies on the temperamental trait of behavioral inhibition (extreme shyness–fearfulness) has consistently shown that as many as 40% of initially inhibited infants and toddlers

become substantially less inhibited by age 6 years (Kagan et al., 1987). Extensive research with behaviorally inhibited infants and children suggest that a combination of biogenetic factors, parenting styles, and other aspects of socialization help explain both the continuity and discontinuity in their shyness–fearfulness (Kagan et al., 1988). A recent large-scale longitudinal (0–4 years) study (N. Fox et al., 2001) of behavioral inhibition suggests that nonparental care and other aspects of socialization in the first 2 years may contribute to change in temperamental inhibition. Another longitudinal study (Asendorpf, 1994) showed that child characteristics contribute to the malleability of behavioral inhibition. Individual developmental functions in observed inhibited behavior showed that verbal intelligence and teacher ratings of social competence at age 4 years predicted a decrease in inhibition toward strangers and in the classroom at age 10 (Asendorpf, 1994). Prevention programs may have a positive effect on verbal intelligence, and they definitely can increase children’s social competence (M. T. Greenberg et al., 1995; Solomon et al., 1988).

Conscience development in children who show fear proneness benefits from a parenting style that deemphasizes disciplinary techniques that involve power assertion and makes more use of positive emotional interactions. Apparently, a child temperament factor moderates the effect of moral socialization, and different child-care styles show differential effectiveness for children with different temperaments (Kochanska, 1997).

Evidence suggests that children with stable patterns of emotions associated with depressive tendencies would benefit from program content and techniques designed to help not only with sadness but also with the management of anger, often inner-directed anger, the second most prominent emotion in depression (Blumberg & Izard, 1985). Helping children deal with their sadness over loss or failure (Izard, Levinson, Ackerman, Kogos, Blumberg, 1999) may increase their sense of well-being, which in turn may help alleviate the associated inner-directed anger (Fredrickson, 2001; Izard, 1977; Tomkins, 1963). Redirecting the anger away from the self and toward the development of social or academic skills helps in surmounting barriers that block the explicit or implicit goal of self-efficacy. Increased self-efficacy may further attenuate the sadness or depression (Jaycox, Reivich, Gillham, & Seligman, 1994).

#### *Applications of Principle 5: Managing Patterns of Emotions in Preventive Interventions*

*Applications concerning event-related patterns.* PATHS has lessons explicitly designed to help children cope with situations that tend to elicit patterns of emotions. It aims to help children understand that jealousy may involve anger in one situation, sadness in another, and both anger and sadness in yet other situations. It recognizes that a single event may elicit two conflicting emotions and tries to help children understand how these complex motivating conditions affect their thoughts and behavior. One lesson deals with humiliation in terms of situations that may cause shame, sadness, guilt, and highly intense emotional experiences. Other lessons deal with pride and shame, guilt and anger, and the roles of these patterns in self-evaluation and personal responsibility. Children are given opportunities to discuss experiences that relate to events or situations that cause multiple emotions and

engage in role play and other activities to practice managing complex emotional situations.

Although PATHS has lessons that deal with patterns of emotions, particularly the self-conscious emotions involved in self-evaluation, it may benefit from more content and activities that help children identify situations that are likely to cause multiple emotions and combinations of emotions that tend to co-occur more frequently than others. More attention might be given to the distinct motivational characteristics and action tendencies of competing emotions in the frequently recurring patterns. Such material may help children become more aware of relations between particular situations, particular patterns of emotions and motivations, and subsequent patterns of behavior. This increased awareness should enable them to anticipate the emotion experiences of difficult situations and rehearse effective coping strategies.

PATHS gives some attention to the concept of emotion utilization as it relates to patterns of self-conscious emotions. It deals with guilt that may lead to inner-directed anger and emphasizes the adaptive function of guilt in motivating one to make amends and repair relationships. However, its lesson on shame does not discuss the shame–anger pattern or shame as motivation for social conformity and self-improvement that may render the self less vulnerable to shame in the future.

CDP does not deal with discrete emotion concepts or with patterns of emotions. However, it has some components that probably foster positive uses of social comparison and constructive use of the related emotions and emotion patterns. CDP’s buddy system pairs older children with younger children in helping relationships (Solomon et al. 1990). This system provides many opportunities for the younger child to improve task mastery and achievement through nonthreatening comparisons with the older child. CDP also includes cooperative learning activities for same-age children (classmates). These activities include opportunities for emotion- and social-perspective taking, social comparison, self-evaluation, and self-improvement. CDP’s emphasis on helping children feel that they are a part of a caring and just community and socially responsible group (Solomon, Schaps, Watson, & Battistich, 1992) probably sets the stage for positive and constructive use of these self-evaluative and social comparison processes and effective utilization of the related patterns of emotions.

*Applications related to patterns of emotions in traits and chronic conditions.* Universal programs have paid little attention to patterns of trait emotions or temperament. However, a targeted program that helped depressed children restructure their causal attributions or explanatory style may have succeeded, in part, because it addressed self-esteem issues that stem from both the sadness of isolation and inner-directed anger associated with feelings of social and academic failure (Jaycox et al., 1994). A temperament-based prevention program for parents of 3- to 5-year-old children with difficult temperaments yielded results consistent with the notion that changes in parenting techniques may result in moderating the effects of temperament or trait–emotion patterns and thereby improve parent–child relationships and child social functioning. Parents who completed the program reported feeling more strongly attached to their children and more emotional closeness with them (Sheeber & Johnson, 1994).

Prevention programs have not yet dealt specifically with some of the important patterns of emotions like the sad–mad pattern in depression and the shame–anger–aggression pattern that may char-

acterize rejected and chronically aggressive children. Effective techniques for dealing with these patterns may not prove practical for universal programs but may well become an important feature of programs that target groups of withdrawn or aggressive children. The authors of the Anger Coping Program (Lochman & Lenhart, 1993), which targets aggressive and antisocial children, noted the need to take individual differences in emotionality and temperament into account. They found that it was more difficult to get good results for children who have low emotion thresholds for anger and impulsive acts and high stable rates of hostile attributions.

Although universal programs cannot tailor lessons for each child's temperament, they can increase teachers' awareness of individual differences in children's emotion thresholds and reactivity. Such awareness should help teachers in conducting one-on-one dialogues occasioned by disruptive or aggressive behavior that requires discipline. Teachers can also use activities that increase children's understanding and acceptance of individual differences in emotion responses to specific events and in emotion expression styles (e.g., ICPS, PATHS).

#### *Principle 6: Emotional Deprivation in Early Life Results in Dysfunctional Emotion Systems*

Since the work of Harlow and his colleagues (Harlow, 1971; Harlow & Novak, 1973; Suomi & Harlow, 1972) with rhesus monkeys, researchers have known that positive social and emotional communication play a critical role in healthy development. Early socioemotional deprivation leads to severe behavioral and neurophysiological problems in later life (Harlow, 1971; Suomi & Harlow, 1972). Their work and that of others made it clear that emotional deprivation is the most significant aspect of social deprivation. The problems stemming from socioemotional deprivation include an inability to discriminate among or interpret social and emotional cues and hence experiences of extremely maladaptive interactions in the social and physical environment. These problems proved quite resistant to therapy (Harlow & Novak, 1973; Suomi & Harlow, 1972).

Extensive research on infant-mother attachment demonstrates that social interaction alone proves insufficient for healthy development. In addition to the cognitive and physical aspects of social exchanges, positive emotion communication, emotional responsiveness, and emotional support are essential to relationships, adaptation, and well-being (Ainsworth et al., 1978; Bowlby, 1980; Cassidy & Shaver, 1999). Marital discord that results in frequent expressions of negative emotionality and relative absence of positive emotionality in the family predicts poor emotion regulation and poor peer relations in young children (Gottman & Katz, 1989; Levenson & Gottman, 1983).

#### *Socioemotional Deprivation and Neurobiological Development*

In the past decade, neuroscientists have shown that early socioemotional deprivation not only damages emotion communication and causes severe behavior problems, it changes the stress response systems and chemoarchitecture of the brain. It has serious effects on the monoaminergic neurotransmitter systems and the hypothalamic-pituitary-adrenal axis (Bikerdike, Wright, & Mars-

den, 1993; Cicchetti & Rogosch, 2001a, 2001b; Jaffe, de Frias, & Ibarra, 1993; Liu et al., 1997; Thompson & Nelson, 2001). Moreover, biochemical changes resulting from stress such as early maternal separation actually reduce the number of neurons in the anterior cingulate gyrus, prefrontal cortex, and nucleus accumbens, all areas intimately involved in emotion information processing (Poeggel et al., 1999). The brain systems adversely affected by socioemotional deprivation (anterior cingulate and bilateral frontal gyri) subserve the facial expression component of emotion communication (George et al., 1993). Some neuroscientists have speculated that experience-induced brain pathology may cause cell death in the neural substrates of socioemotional development (Gabriel & Taylor, 1998). They suggested that early-separation effects may have consequences for socioemotional development as great as those produced by stressors such as prenatal exposure to cocaine, which adversely affects GABA neurons in the anterior cingulate cortex.

It does not take complete physical separation or social isolation to produce profound neural and behavioral effects on the young. Surgically induced loss of maternal vocal communication produced adverse biochemical changes in the precentral medial and anterior cingulate cortices, reduced body weight, and an inability to discriminate and interpret maternal calls in the pups of the species *Octodon degus*, a precocious rodent (Poeggel & Braun, 1996). Furthermore, cross-fostering experiments with rats showed that naturally occurring variations in maternal care can provide the basis for nongenomic behavioral transmission of stress reactivity indexed in terms of hypothalamic-pituitary-adrenal activity as well as behavioral responses. Mothers high in licking, grooming, and arched-back nursing (LG-ABN) have pups that show less stress reactivity and fearfulness than pups of mothers who show low LG-ABN (Francis et al., 1999).

#### *Socioemotional Deprivation From Ineffective, Harsh, or Dysfunctional Parenting*

The biopsychological research on the effects of socioemotional deprivation on neural systems complements behavioral research on brief deprivation of emotion expressions in humans. Breakdowns, deliberate suppression, or insufficiency of such expression have negative consequences for the development of socioemotional competence, relationships, and mental health (Hobson, 1995; Kennedy-Moore & Watson, 1999; Kochanska & Askan, 1995; Kochanska & Murray, 2000). For example, even minor interruptions in mother-infant emotion communication tends to produce negative emotion expressions in the child and a decrease in play behavior that is essential to healthy development (Termine & Izard, 1988; Tronick, 1989; Tronick, Als, Adamson, Wise, & Brazelton, 1978). Even the development of normal speech patterns in the infant may depend on timely vocal expressions of emotions by the mother (Trainor, Austin, & Desjardins, 2000).

Child maltreatment may represent one of the most common and devastating sources of socioemotional deprivation (Cicchetti & Lynch, 1995). It has long been known that the socioemotional deprivation resulting from maltreatment causes serious abnormal development in psychosocial systems and that such maldevelopment has severe long-term consequences (Cicchetti & Rizley, 1981; Rutter & Quinton, 1984). More recently, investigators have shown that stressful environments and child maltreatment have

adverse effects on emotion-related physiological functioning, particularly the stress-response system—the hypothalamic-pituitary-adrenocortical axis (Cicchetti & Rogosch, 2001a, 2001b; Hart, Gunnar, & Cicchetti, 1995, 1996; Pollak, Cicchetti, & Klorman, 1998; Pollak, Cicchetti, Klorman, & Brumaghim, 1997). Results of Pollack et al.'s (1997) study, based on analyses of cognitive event-related potentials (P300 amplitude), suggested a specific problem in the cognitive processing of the information in emotion expressions, a problem that could seriously impede maltreated children's acquisition of emotion knowledge (Pollak, Cicchetti, Hornung, & Reed, 2000).

The effects of parenting by emotionally disturbed or psychotic parents undoubtedly include a degree of socioemotional deprivation, and such deprivation has a negative influence on children's emotional development and places them at risk for the development of psychopathology (Cicchetti & Schneider-Rosen, 1986; Cummings & Davies, 1994; Downey & Coyne, 1990; Kendziora & O'Leary, 1993). Biological models do not account for all the variance in such risk. Depressed parents respond to their children more negatively, intrusively, and with less supportive nurturing (Dodge, 1990; Field, Healy, Goldstein, & Guthertz, 1990). Thus, children of mentally disturbed parents may not have good models or guidance for the development of adaptive skills in emotion communication and the acquisition of emotion knowledge. For example, investigators studying the effects of depressed mothers on children found that in a group of 5- to 9-year-old children, the younger children showed overarousal to hypothetical situations of interpersonal conflict. The older children responded to the situations with an abnormal pattern of guilt, and the guilt responses did not cohere across situations (Zahn-Waxler, Kochanska, Krupnick, & McKnew, 1990). Abnormal patterns of guilt could impede the development of empathy and prosocial behavior.

#### *Implications of Principle 6: Early Emotion Communication Prevents Emotional Deprivation and Dysfunctional Emotion Systems*

Data from both behavioral research and neuroscience indicate that preventing the development of dysfunctional emotion systems requires early practice in socioemotional communication, including the sharing of positive emotion (Ainsworth et al., 1978; Bowlby, 1980; Izard et al., 1991, 1995; Kochanska & Askan, 1995; Poeggel et al., 1999). Although many expressive behaviors come with our genetic heritage and emerge early in the life of the infant (Izard et al., 1995), the development of socioemotional competence depends on modulated expressive behavior and positive emotion expression in interpersonal exchanges. It also depends on appropriate expression of the negative emotions. Parental expressions of sadness can convey empathy or sympathy (Hoffman, 2000). Situationally appropriate expressions of other negative emotions (e.g., fear) directed to infants experiencing ambiguous situations that may prove dangerous can help them pass the developmental task of achieving effective use of social referencing (Feinman, 1985; Klinnert, Campos, Sorce, Emde, & Svejda, 1983).

Either global (e.g., attachment) or specific emotion constructs can guide early interventions to prevent socioemotional deprivation and its deleterious effects on development. Clinical investigators have made cogent arguments for enhancing the development of a secure infant–mother attachment in infants whose

parental social bond has been threatened or broken, as in the case of foster children or children of depressed mothers (Cicchetti et al., 1999; Dozier, Higley, Albus, & Nutter, in press; Dozier, Stovall, & Albus, 1999; M. Erickson, Korfmacher, & Egeland, 1992; Olds, Kitzman, Cole, & Robinson, 1997). Such interventions aim to increase the emotional warmth and responsiveness of caregivers (e.g., depressed parents, foster parents) and help them reinterpret and respond appropriately to alienating strategies the children may have developed to avoid further emotional insult or abuse.

Another approach, or one that could complement attachment-oriented interventions, consists of program content and techniques emphasizing positive emotion expression and emotion communication. For young infants, such a program should provide sufficient time devoted to face-to-face play that includes language and a range of facial and vocal emotion expressions dominated by varied expressions of interest and joy (Golinkoff & Hirsh-Pasek, 1999; Izard et al., 1995; Tronick, 1989; Weinberg & Tronick, 1994). Typically, infants thoroughly enjoy such encounters, and they respond to the caregiver's positive overtures with their own facial and vocal expressions of emotions.

#### *Applications of Principle 6: Facilitating Early Emotion Communication in Preventive Interventions*

Although attachment-oriented prevention programs for parents and their infants or toddlers have as their principal goal the achievement of a secure attachment, they undoubtedly affect the emotion systems and emotion communication. Since the introduction of the concept of attachment (Ainsworth et al., 1978; Bowlby, 1980), it has been described in terms of emotions. Positive emotion communication characterizes the interactions of a caregiver and infant in a secure attachment, and even a momentary separation causes intense negative emotion expression by the infant (Shiller, Izard, & Hembree, 1986). Compared with securely attached infants, insecurely attached infants show more negative emotion expressions, and more frequent negative emotion expressions predict negative outcomes in later years (Abe & Izard, 1999b).

Several programs designed to prevent or correct insecure attachments appear to facilitate emotion communication in parent–infant dyads. A meta-analysis of the results of 12 of these interventions showed that although many failed in increasing attachment security, some were successful in increasing maternal sensitivity or responsiveness to the infant's emotion expressions (van IJzendoorn et al., 1995). Since this meta-analysis, other interventions designed to increase maternal self-efficacy and positive parenting practices have failed to improve attachment security or maternal behavioral competence (Gelfand, Teti, Seiner, & Jameson, 1996), but one succeeded in improving the mood of mothers suffering from postpartum depression (Cooper & Murray, 1997).

One sophisticated and well-timed program designed to foster attachment security in infants of depressed mothers proved quite successful (Cicchetti et al., 1999). At the end of the program, the ratio of secure to insecure infants in the intervention group compared quite favorably with that of the nondepressed control group and was much better than that of the depressed control group. The intervention resulted in a significant number of shifts from insecure to secure attachments. This rather extensive intervention (average of 45 therapist–dyad sessions over 59 weeks) aimed to provide the mother a corrective emotion experience that empha-



sized empathy, respect, concern, accommodation, and positive regard. The therapeutic tuition and techniques guided by these concepts undoubtedly increased positive emotion communication, as well as positive emotion induction and positive emotional climate in the relationship.

*Principle 7: Modular and Relatively Independent Emotion and Cognitive Systems Require the Fostering of Intersystem Connections*

In the Nature of Emotions section and in the discussion of Principle 4, I presented evidence that supports the notion of modular and relatively independent emotions and cognitive systems (see Ackerman et al., 1998, for a review). Additional evidence relevant to Principle 7 shows that such independence in the early years of life results in part from differential rates of maturation of the underlying brain systems. Different rates of maturation characterize the neural substrates of the emotions, temperament systems, cognitive systems, and the systems that facilitate the integration of emotion and cognition. The amygdala, a particularly important neural substrate of emotions, emerges and becomes functional early in ontogeny, much earlier than the hippocampus, a structure critical to cognitive processes and memory (Andrews, Freeman, Carter, & Stanton, 1995; M. T. Greenberg & Kusche, 1993; Jacobs & Nadel, 1985; Stanton, 2000). Moreover, the prefrontal cortex, critical to emotion–cognition relations (Damasio, 1999; Bechara et al., 1995), continues to develop in early childhood and throughout the adolescent period (Koenderink & Uylings, 1995; Spear, 2000). The anterior cingulate and midline areas of the prefrontal cortex, identified as neural substrates for an executive system that regulates attention to semantic information and conscious effortful control of behavior, has only limited functionality at ages 2 to 3 years. Although effortful control appears as a statistically separate secondary factor of temperament scales in 3-year-old children, it continues to become better defined and more stable between 4 and 7 years (Derryberry & Rothbart, 1997; Rothbart, Ahadi, Hershey, & Fisher, 2001).

Because of the differential rates of maturation of major brain systems in human development, the young infant has a highly effective social communication system that operates through preadapted expressive behavior signals (Izard & Malatesta, 1987; Malatesta & Izard, 1984). This emotion-based communication system precedes emotion labeling and even rudimentary verbal communication of emotion by about a year and a half (Ackerman et al., 1998; Bretherton & Beeghly-Smith, 1982; Golinkoff & Hirsh-Pasek, 1999). The young infant expresses emotions immediately and meaningfully in response to the mother's emotion expressions (Izard et al., 1995), and positive caregiver–infant interactions include synchronous dyadic encoding and decoding of emotion signals (Stern, 1974; Weinberg & Tronick, 1994).

Many other adaptive advantages appear inherent in the infant's precocious emotion system, including a readiness for interactions with a gentle, nurturing environment (Izard et al., 1995; Izard & Malatesta, 1987; Malatesta & Izard, 1984). Since Darwin's (1872/1965) interesting anecdotal remarks on infant emotion communication, observers have described prelinguistic infants' empathic matching of caregiver expressions and provided anecdotal evidence of toddlers' reactions to others' distress. The latter sometimes include attempts at soothing and helping behavior (Hoffman,

1981). Evidence of shared positive emotion communication in the toddler and preschool years predicts early emerging internalized standards, as well as performance on measures of conscience and moral behavior at school age (Kochanska & Murray, 2000). The capacity for early emotion communication and its positive effects on social competence and relationships may represent the most fundamental adaptation in human evolution (Hobson, 1995; Izard, 1977).

Toward the end of the infancy period, when facial expression and other nonverbal behavior serve as the principal means of interpersonal communication (Izard et al., 1995), the linguistic mode of emotion communication, as indexed by emotion recognition and labeling, emerges and continues to grow steadily through middle childhood and beyond (Izard, 1971). After infancy, socioemotional competence and stable relationships depend on the development and functionality of connections and relations between the emotions and cognitive systems (Emde, 1980; Gottman et al., 1997; Hobson, 1995; Izard & Ackerman, 1997; Kochanska, 1994; Malatesta et al., 1989; Nowicki & Duke, 1994; cf. Ainsworth et al., 1978). Such emotion–cognition connections form the basis of emotion knowledge and constitute a critical factor in emotion regulation and utilization.

*Implications of Principle 7: Intersystem Connections Enhance Emotion Knowledge, Emotion Regulation, and Adaptive Coping Strategies*

Despite the advantages of a precocious system for emotion expression and communication, the relative independence of the emotions in early ontogeny and the complex social and physical environment of contemporary life make it necessary to use preventive interventions to foster the development of emotion–cognition relations and intersystem connections. Such interventions may prove especially needed when socialization and social learning opportunities prove inadequate, as may often happen in economically disadvantaged, neglected, maltreated, or other atypical children (Cicchetti & Manly, 2001; Fitzgerald, Lester, & Zuckerman, 1995). Research on the early development of emotion knowledge, particularly in children living in poverty or near-poverty conditions, indicates that in addition to the benefits that accrue from a genetic capacity for emotion communication, much work remains for the agents of socialization and social learning (Izard et al., 2001). These agents must operate effectively and extensively before children achieve socioemotional competence and specific skills for recognizing, labeling, modulating, and utilizing emotions in various contexts and in every day familial and peer interactions.

Rapid and remarkable advances in language skills in toddlers and preschoolers make intervention techniques concerned with intersystem connections particularly salient. The latter part of this period may represent the prime time for forming connections between emotions and the cognitive and action systems in a social context (Abe & Izard, 1999a). Increasing awareness of emotion feelings and at the same time increasing their symbolization in consciousness represents a highly significant developmental task in early childhood. Techniques that increase awareness of emotion feelings and their functions may help children 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 toddler and preschool years, new thoughts can become associated with emotion feelings. This development in emotion-cognition-language relations is particularly noticeable for the emotion of anger because of its role in the frequent expressions of autonomy and oppositional defiant behavior during this period (Dunn & Munn, 1987; Spitz, 1957; Wenar, 1982). Anger feelings can now be expressed verbally in protests and in efforts to obtain concessions from caregivers.

*Increasing intersystem connections for emotion knowledge and emotion utilization.* Emotion-centered prevention techniques for developing intersystem connections in young children should enhance their ability to accurately detect and label emotion signals. They need to include practice at recognizing, labeling, and communicating about their own and others' emotions (induced by pretend play, role play, and emotion stories). At a more global level, complementary techniques should aim to help children modulate arousal so they can appreciate and act on the inherently adaptive motivation of each of the emotion feelings they experience.

The development of intersystem connections involved in socio-emotional communication skills and socioemotional competence is influenced by gender and individual differences in cognitive ability and in temperament-emotionality (Denham, 1998; Izard et al., 2000). Evidence from a recent meta-analysis shows that from infancy through adolescence, girls have an advantage over boys in processing facial expressive information about emotions (McClure, 2000). This research also shows that girls depend more heavily on the emotional aspects of social communication than boys. Developing and maintaining good peer relations among preadolescent girls depends more on social problem solving or negotiation during conflict (Miller, Danaher, & Forbes, 1986), cooperative interactions, and comprehension of others' expressive or nonverbal signals (Coie, Dodge, & Coppotelli, 1982). Basic components of emotion knowledge such as expression recognition and labeling contribute to the development of these social skills (Denham, 1998; Izard et al., 2001). These findings suggest that teachers of universal prevention programs should be sensitive to these gender differences in presenting material and responding to questions. The findings may also provide some guidance for targeted preventions or booster sessions for boys or girls at risk because of gender-related behavior (e.g., relational aggression; Crick & Grotpeter, 1995) that has implications for social adjustment.

*High or low emotion knowledge: Possible pay offs in behavioral outcomes.* For both boys and girls, research has shown that high emotion knowledge in Head Start predicted better psychological adjustment, interpersonal skills, and academic competence in third grade (e.g., Izard et al., 2001). Moreover, early competence in understanding emotion signals correlated positively with behavioral outcomes such as peer acceptance and predicted adaptive social behavior in later childhood (Denham, McKinley, Couchoud, & Holt, 1990; Fine et al., in press; Garner, Jones, & Miner, 1994; Izard et al., 2001; see also Denham, 1998, for a review). Therefore, the data suggest that children's accurate recognition and understanding of the emotion expressions of others increases their likelihood of experiencing and utilizing the emotion feelings appropriate to the interpersonal interaction.

Low emotion knowledge relates significantly to aggression and peer rejection in clinic samples high on externalizing and in victims of abuse (Casey & Schlosser, 1994; Rogosch, Cicchetti, & Aber, 1995; Speltz, DeKlyen, Calderon, Greenberg, & Fisher, 1999). Deficits in emotion recognition and labeling in Head Start children at age 5 years predicted teacher- and self-reported depressive tendencies (feelings of loneliness, hopelessness) and withdrawal behavior at age 9 years (Fine et al., in press). A number of studies have shown that anger-perception bias relates to poor emotion regulation and aggression in Head Start children (Schultz, Izard, & Ackerman, 2000), preschool and elementary school children (Barth & Bastiani, 1997; Fine, Trentacosta, Izard, Mostow, & Campbell, 2001), and in maltreated children (Pollak et al., 2000).

Research suggests that preventive interventions that lead to increases in emotion knowledge and emotion utilization may also lead to decreases in behavior problems associated with poor emotion knowledge and emotion-perception bias. Yet, investigators still have a major challenge in determining how emotion knowledge and other aspects of the emotion components of prevention programs are translated into the skills involved in the social communication and social interactions of everyday life.

#### *Applications of Principle 7: Facilitating the Development of Adaptive Emotion-Cognition Connections in Preventive Interventions*

Although most of the popular prevention programs with a strong emphasis on social skills and social problem solving have no component relating specifically to Principle 7, ICPS (Shure, 1993) has an emotion component that includes activities intended to facilitate the development of emotion-cognition relations. The aim of the emotions component is to help children learn to identify emotions and consider others' feelings and how they might differ from their own. The authors of ICPS viewed the emotion content of the program as a means to develop the prerequisite cognitions for problem solving (Spivack & Shure, 1989). They designed various activities to help children learn how to tell the difference between the emotions of happiness, sadness, and anger. The instructional material and activities for making these distinctions are quite general and give little attention to the specific emotions. Other activities that aim to help children understand the causes and effects of these emotions may contribute to the forming of intersystem connections. The authors of ICPS did not view emotions in terms of potentially useful motivation and hence did not consider the concept of emotion utilization.

The Anger Coping Program has several features that can be considered applications of Principle 7 (Lochman, Lampron, Gemmer, & Harris, 1987; see also Lochman & Lenhart, 1993, for a review). It provides opportunities for children to increase their emotion knowledge through group discussions of anger experiences and their causes and consequences. It has special techniques to increase children's awareness of the inner (physiological) signals of anger. The program's emphasis on emotion-eliciting techniques such as role play and group discussion of problems and solutions has the potential to help with developing appropriate connections between emotions and cognition (coping strategies) and their use as tools in social functioning.

PATHS (M. T. Greenberg & Kusche, 1993; M. T. Greenberg et al., 1995) and Second Step (Beland, 1997; Grossman et al., 1997;

McMahon, Washburn, Felix, Yakin, Childrey, 2000) exemplify the few programs that include numerous discrete emotion concepts and many lessons and activities to facilitate the development of emotion–cognition connections and increase children’s emotion knowledge. For example, they engage children in role play and other activities such as interactive reading of emotion story books to involve them in labeling and discussing emotion feelings and event–emotion–behavior relations. Because of its extensive use as a component in carefully designed and large-scale prevention trials, I focus on PATHS for other illustrative content and techniques relating to the application of Principle 7.

The authors of PATHS (M. T. Greenberg & Kusche, 1993; Kusche & Greenberg, 1994) recognized the primacy of emotions in development and the need to foster connections between the emotions and the later developing cognitive, linguistic, and action systems. PATHS represents a pioneering effort in developing a school-based preventive intervention with both extensive material on discrete emotions and assessment devices designed specifically to determine the extent to which children increase their emotion knowledge. PATHS alone and in combination with other prevention program components has proved effective in increasing emotion knowledge, enhancing the development of socioemotional competence, and reducing behavior problems (Conduct Problems Prevention Research Group, 1999a, 1999b; M. T. Greenberg & Kusche, 1998; M. T. Greenberg et al., 1995).

In PATHS, content and techniques relevant to applications of Principle 7 involve teaching children about emotion feelings and their relations to cognition and action. Like some other established school-based prevention programs, PATHS explicitly teaches children that all feelings are OK (e.g., PATHS; M. T. Greenberg et al., 1995). A noteworthy goal in adopting this view is to help children distinguish between feelings and actions, between feeling angry and acting aggressively. The idea that all feelings are OK is consistent with PATHS’s stronger emphasis on self-control, the control of behavior, and social problem solving than on modulation of emotion feelings as a means of utilizing emotion motivation.

Although the rule that all feelings are OK may work well much of the time, it may not apply in situations where unjustifiable feelings are activated by one’s perceptual bias or by prejudices stemming from oppressive cultural attitudes and customs. Examples are anger feelings due to hostile attributional bias (Crick & Dodge, 1994) and contempt and peer rejection based on perceived ethnic or religious differences (Izard, 1977). Environmental risk factors, socialization practices, and peer culture can make such unwarranted feelings part of maladaptive affective–cognitive structures that need to be addressed as problems and treated in preventive interventions (Izard & Harris, 1995; Mayer & Salovey, 1997; Schultz et al., 2000).

In helping children learn to recognize and label emotion expressions and feelings, the authors of PATHS (Kusche & Greenberg, 1994), like authors of other widely used programs such as Second Step, did not use research-based criteria (e.g., Ekman & Friesen, 1978; Izard, 1979) in representing emotions conceptually or pictorially (Beland, 1997; M. T. Greenberg & Kusche, 1993). Some of these programs deal with as many as 35 different emotions or emotion-related concepts. Many of these concepts cannot be reliably represented in facial expressions and require contextual information for interpretation. The material in popular programs

relating to emotion recognition and labeling should benefit from research-based selection of pictures or drawings and combinations of pictures and contextual information that adults match reliably with the target emotions or emotion-related concepts.

#### Issues for Future Research: Assessing the Effectiveness of Theoretically Coherent Preventive Interventions and Identifying Causal Processes in Behavioral Outcomes

Does an emotions component contribute to the positive behavioral outcomes reported in program evaluation research? Evaluation of programs that included PATHS may provide the best evidence of the overall effectiveness of a school-based program with a strong emotions component. One such intervention program (Fast Track) included PATHS and several other prevention components. A large-scale implementation of Fast Track in 198 classrooms yielded two studies. The first concerned the effects of the entire program on selected children at high risk for conduct disorder and showed significant improvements in children’s peer interactions, socioemotional competence, and academic skills (Conduct Problems Prevention Research Group, 1999a).

The second study focused on the effectiveness of PATHS on the remaining (low-risk) children in the sample. This study showed that the intervention, in which PATHS was the principal component, produced a decrease in aggressive behavior and improvements in peer relations among the low-risk children (Conduct Problems Prevention Research Group, 1999b). However, the authors noted some limitations in attributing the effects in the second study to PATHS alone. One Fast Track component remained a possible causal factor (general feedback to teachers on classroom behavior and management provided by Fast Track staff). Moreover, Fast Track as a whole may have had an indirect effect on the low-risk children because it improved the behavior of their most aggressive and difficult (high-risk) classmates. Eliminating the high-risk children from the analyses did not control for the possibility of such a carryover effect. Although the evidence of significant positive outcomes may not be attributable to PATHS alone, it seems reasonable to assume that PATHS was a significant and perhaps primary contributor.

Other studies show evidence of the effectiveness of PATHS as a stand-alone program. One study found significant effects in increasing emotion knowledge in a large sample of regular and special education classes (M. T. Greenberg et al., 1995). Another reported increases in both emotion knowledge and adaptive social behavior in a small sample of deaf children (M. T. Greenberg & Kusche, 1998). However, the authors of PATHS (M. T. Greenberg & Kusche, 1993) described their intervention as a hybrid in terms of theory and method. The program contains major components on self-control and social problem solving, as well as one on emotions, and the authors have not systematically tested the effectiveness of the separate components in terms of their contribution to behavioral outcomes.

Many psychology-based prevention programs have proven effective in enhancing mental health or socioemotional competence and preventing behavior problems. This is a highly noteworthy and socially significant accomplishment. However, despite clear criteria for program content and evaluation (Coie et al., 1993) and unique opportunities to study human development and adaptive change, prevention research has not shown remarkable success in

advancing psychological science. Scientifically effective prevention research begins by identifying causal processes in the outcome to be prevented. It then evaluates the relations between causal processes assumedly activated by the prevention program and the desired behavioral outcomes (Robins, 1992). Generally, prevention researchers have not taken both of these steps.

No preventive intervention has demonstrated the effectiveness of an emotion-centered program or emotions component alone in promoting socioemotional competence or in reducing aggression, withdrawal, and other behavior problems. Moreover, no one has shown that programs that deal with the specifics of discrete emotions—their expressions, feeling states, functions, regulation (e.g., PATHS; M. T. Greenberg & Kusche, 1993)—are more or less effective than programs that deal with more general emotion-related constructs such as prosocial orientation and caring community (e.g., CDP; Solomon et al., 2000).

The questions regarding the effectiveness of an emotion-centered program or program component apply to other types of programs as well. In many instances, prevention researchers have not specified and tested models of change and shown relations between features of the program and various aspects of child functioning reflected in behavioral outcomes (Robins, 1992). Two approaches may help surmount this problem.

The first approach would test the effectiveness of a program or program component based on a single conceptual framework (social-cognitive, cognitive-behavioral, social information processing, or any one of several emotion theories). Researchers would derive all substance and techniques from the chosen theory.

The second approach would build on the notion that emotion, cognition, and action affect each other reciprocally (Izard, 1993; Lazarus, 1991) and attempt to make a conceptually complex preventive intervention into a theoretically coherent program. For example, existing programs that have a component based on emotion theory and one based on social-cognitive theory could teach social-cognitive skills within an emotion-theory framework. Coaching children in how to respond prosocially to the motivation inherent in the emotions experienced in empathy provides an example (Krevans & Gibbs, 1996; Hoffman, 2000). An approach that teaches cognitive and social skills in an emotion-theory framework would place emphasis on principles relating to the individual and social functions of emotions and connect social and cognitive skills to emotion motivation. It would teach emotion modulation for purposes of emotion utilization, not emotion regulation simply for behavior control. The authors of PATHS appear to have made some strides in this direction by emphasizing that emotions contain useful information that can guide cognition and action (M. T. Greenberg & Kusche, 1993; Kusche & Greenberg, 1994). In contrast, researchers could teach emotions within a cognitive-behavioral framework by emphasizing cognitive and behavioral control of emotions to facilitate self-regulation without using theory and techniques related to the functions and motivational properties of emotions.

In any case, more prevention research needs to begin with a theoretically coherent program and a related model of change. It needs to test hypotheses about the relations of theory-based interventions (designed to activate particular causal processes) and well-defined aspects of individual and social functioning. Such prevention research would enable scientists to study the processes that mediate or moderate the complex relations between causal

factors and the behavioral outcomes reflected in normal and abnormal development.

## Conclusion

The complexities of contemporary life place great demands on emotion systems, systems rooted in the human genome and generative of sensitivities and skills critical to evolution and adaptation. In the face of these demands on systems evolved in simpler times, the socialization and nurturing of emotions, particularly for children in impoverished environments, may often prove inadequate. Such inadequacy, perhaps in part an indication that biological evolution proceeds more slowly than cultural evolution, creates the need for emotion-centered preventive interventions.

All the major components of psychological science have contributed to very substantial advances in the understanding of emotions, their activation, functions, and relations to cognition and action. These contributions to the science of emotion provide the basis for principles and techniques for prevention programs designed to foster the development of socioemotional competence and prevent aggression, violence, social withdrawal, and other behavior problems. It seems that the robust status of emotion science on the one hand and the prevalence of behavior problems and socioemotional deficiencies among today's children and youth on the other should compel psychologists to try to improve efforts to translate emotion science into practice.

Strengthening the scientific basis for preventive interventions and developing innovative techniques for translating science into effective practice that can improve the science remain as challenges for future program development and evaluation research. Evaluating theoretically coherent preventive interventions should facilitate the testing of specific hypotheses about development and behavioral change, advance science, and provide an invaluable service for society.

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