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Emotional Regulation and Emotional Development

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Current neofunctionalist views of emotion underscore the biologically adaptive and psychologically constructive contributions of emotion to organized behavior, but little is known of the development of the emotional regulatory processes by which this is fostered. Emotional regulation refers to the extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions. This review provides a developmental outline of emotional regulation and its relation to emotional development throughout the life-span. The biological foundations of emotional self-regulation and individual differences in regulatory tendencies are summarized. Extrinsic influences on the early regulation of a child's emotion and their long-term significance are then discussed, including a parent's direct intervention strategies, selective reinforcement and modeling processes, affective induction, and the caregiver's ecological control of opportunity for heightened emotion and its management. Intrinsic contributors to the growth of emotional self-regulatory capacities include the emergence of language and cognitive skills, the child's growing emotional and self-understanding (and cognized strategies of emotional self-control), and the emergence of a "theory of personal emotion" in adolescence.

KEY WORDS: emotion; self-regulation; development.

INTRODUCTION

Recent neofunctionalist views of emotion have underscored the biologically adaptive and psychologically constructive contributions of emotion to competent and strategic behavior (e.g., Barrett and Campos, 1987;

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Bretherton, Fritz, Zahn-Waxler, and Ridgeway, 1986: Campos, Barrett, Lamb, Goldsmith, and Stenberg, 1983; Campos, Campos, and Barrett, 1989; Malatesta, 1990; Saarni and Harris, 1989). Contrary to traditional formulations that emphasized how the irrational and stressful features of emotional arousal make it difficult to maintain competent functioning, these newer views emphasize how emotions organize social communication and interaction, personality processes, goal-achievement, and cognitive processing from an early age. Informed by bioevolutionary models of emotion in human adaptation, neofunctionalist views note that while emotional arousal retains its capacity to undermine healthy functioning, it also motivates and guides, even in children, adaptive behavioral processes as diverse as empathy (e.g., Hoffman, 1982), memory retrieval (Fagan, Ohr, Fleckenstein, and Ribner, 1985), parent–infant interaction (Gianino and Tronick, 1988), attachment (Thompson, Connell, and Bridges, 1988), and self- and other-understanding (Bretherton, McNew, and Beeghly-Smith, 1981). Emotion can thus be a "behavior regulator" (cf. Klinnert, Campos, Sorce, Emde, and Svejda, 1983) as well as a detriment to competency.

This paper addresses an important but somewhat neglected aspect of this emerging viewpoint: the development of emotional regulatory processes. In many respects, the capacity of emotion to promote or undermine constructive functioning depends on the extent to which emotional arousal is monitored, evaluated, and (if necessary) controlled by the individual. In a sense, emotional arousal must itself be regulated for emotion to helpfully guide competent functioning. This is true not because emotional arousal *per se* is disorganizing, but because its biologically and psychologically adaptive motivational and organizational characteristics are contingent on arousal remaining within the individual's capacities to cope. This is especially evident in developmental analysis. Emotional arousal is regulated primarily by others early in life as caregivers monitor and regulate the baby's distress, promote positive affect, and direct the emergence of self-referent emotions, e.g., guilt and pride. But emotional arousal becomes increasingly self-regulated as the result of neurophysiological development, the growth of cognitive and linguistic skills, and the emergence of emotional and self-understanding. As a consequence, whereas the newborn infant may cry uncontrollably when distressed, the toddler is capable of seeking assistance, the preschooler can reflect upon and talk about her feelings, the school-age child can re-direct attention and use other deliberate strategies to reduce distress (and can control its expression to others), and the adolescent has sufficient self-understanding to evoke more personal, idiosyncratic self-regulatory strategies. These developmental changes not only render the child better capable of maintaining satisfying emotional homeostasis, but

also permit her to enlist emotional arousal more successfully in ongoing transactions with the social and nonsocial surroundings.

Although there has been considerable interest, therefore, in emotion as a regulator of other developmental processes (cf. Campos *et al.*, 1989), there has been little attention to how emotion itself is regulated and how capacities for emotional regulation affect the course of emotional development. The purpose of this paper is to offer a developmental outline of the latter (see also Thompson, 1990).

EMOTIONAL REGULATION AND BEHAVIORAL DEVELOPMENT

Emotional regulation may be defined as the extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their intensive and temporal features. Biologically, emotions organize and coordinate multi-system responses to significant environmental events (e.g., Levenson, 1988). Thus, emotional regulatory processes are necessary both to provide flexibility (rather than stereotypy) to the behavioral processes that emotions help to motivate and direct, and also to enable organisms to respond quickly and efficiently to changes in their conditions by maintaining internal arousal within performance-enhancing limits. Not surprisingly, therefore, the evolution of higher-order cortical functions has fostered inhibitory controls over subcortical emotive processes (Panksepp, 1989), although inhibitory as well as excitatory processes related to emotional arousal can be found at various levels of nervous system organization (e.g., Dawson and Panagiotides, in press; Gunnar, 1986; Porges, 1991). Thus, although humans may be evolutionarily equipped with a basic repertoire of primary emotions (cf. Izard and Malatesta, 1987), there are also biological foundations to emotional regulatory processes that significantly alter these primary emotional experiences that have evolved to provide increased flexibility and efficiency to emotive motivational systems.

Psychologically, emotional regulation is a painstaking developmental process because it requires intervening into phylogenetically deeply-rooted affect systems with psychologically complex control mechanisms. For this reason, the management of emotion is an important component of "emotional maturity" (Jersild, 1954) and "emotional competence" (Gordon, 1989; Saarni, 1990). The growth of emotional regulatory capacities is a significant part of emotional development, because as emotion is externally managed and increasingly self-regulated with development, emotional experience becomes socialized, acquires new meaning for the individual, can

be self-controlled and used purposively, and can thus be integrated into the child's growing repertoire of strategic behavioral processes. A broadening range of emotional regulatory competencies thus assists the child's own behavioral self-regulation while also channeling emotional experience in ways consistent with the "emotional culture" (Gordon, 1989) in which the child is raised.

This is illustrated by a recent ethnographic study of three mothers and their 2 1/2-year-old girls in a blue-collar neighborhood in South Baltimore (Miller and Moore, 1989; Miller and Sperry, 1987, 1988). These mothers used a variety of deliberate socialization strategies to emotionally "toughen" their young offspring and guide their expressions of anger in light of the demands for assertiveness and self-defense in their inner-city neighborhood. These strategies included selectively reinforcing justified aggressive outbursts but rewarding self-control when aggression was unjustified or inappropriate; provoking mock "practice" episodes of aggression; fostering the child's anger when self-defense seemed warranted; and using verbal comments to interpret, challenge, warn, or pacify the child. As a consequence, their young offspring possessed a varied repertoire for expressing anger and learned to regulate, evoke, or disinhibit feelings of anger in subculture-specific ways. These socialization processes have functional value for children in the settings in which they are growing up, but they may also be dysfunctional in other interactive contexts. Self-assertiveness is not likely to benefit the child in subcultural settings with different values, for example, such as in the authority relations between students and teachers, or later between employees and employers. In these contexts, the effects of the child's socialized strategies of emotional management are much different because the meaning and interpretation of their emotional expressions is different outside the neighborhood in which they are appropriate. Thus, emotional regulatory processes help to channel the meaning and significance of emotional arousal in adaptive ways in particular contexts.

Another reason for the importance of emotional regulation to emotional development is that an understanding of emotional regulation provides a window into the growth of individual differences in personality and social functioning. Individual differences in infants' reactions to strangers and separation are indexed primarily by variations in emotionality (e.g., Thompson and Limber, 1990). Variations in the quality of peer relationships are related to the child's emotional self-regulatory skills (e.g., Gottman and Mettetal, 1986). Moreover, there is considerable evidence that variations in the security of infant–parent attachment are related to the child's ability to cope with the stress of infant–mother separation in the Strange Situation. These coping capacities depend, in part, on the amount of prior experience with separation (cf. Miyake, Chen, and Campos, 1985;

Sagi, Lamb, Lewkowicz, Shoham, Dvir, and Estes, 1985), support from the caregiver (Dickstein, Thompson, Estes, Malkin, and Lamb, 1984), temperamental vulnerability (Gunnar, Mangelsdorf, Kestenbaum, Lang, Larson, and Andreas, 1991), and congenital characteristics (Stiefel, Plunkett, and Meisels, 1987; Thompson, Cicchetti, Lamb, and Malkin, 1985), as well as the development of early emotional self-regulatory capacities (Thompson *et al.*, 1988). Emotional regulatory skills are also related to problems in peer relationships (Rubin and Rose-Krasnor, 1986, in press), such as with children whose anger and social inferences lead to aggression against agemates (Dodge, 1991; Dodge, Pettit, McClaskey, and Brown, 1986), or with children who are socially withdrawn because of shyness. Taken together, the growth of emotional regulatory skills may provide a developmental foundation for the emergence of social competence.

Similarly, individual differences in significant dimensions of child temperament, personality, or behavioral style (e.g., dominant mood, approach-withdrawal, or threshold of responsiveness) may also have their roots in variations in emotional regulatory competencies (the same is true of adults with respect to dominant personality dimensions like warmth and extraversion). As revealed in the studies by Kagan (Kagan, Reznick, and Gibbons, 1989; Kagan, Reznick, and Snidman, 1987) and Fox (1989a,b), for example, physiologically-based individual differences in the functioning of neural structures modulating emotionality are associated with behavioral markers of wariness, fearfulness, and inhibition. These differences in emotional and behavioral style are also influenced by caregiving interventions (see Kagan *et al.*, 1987). Thus, physiologically- and experientially-based tendencies related to the management and control of emotional arousal have broad implications for an individual's style of engagement with the social and nonsocial world. The studies by Kagan and Fox suggest that if emotional regulatory processes shape the quality of emotional experience for an individual in ways that promote a withdrawn or outgoing behavioral style, then variations in regulatory skills or tendencies may help explain why emotional arousal means different things to different individuals throughout the life-span (e.g., for some, the arousal of anger is empowering such that for example, and for others, it is to be denied or avoided). Emotional regulation underlies many differences in social and personality functioning.

Another reason for the importance of emotional regulation is that emotional regulatory processes are linked to cognitive functioning and academic achievement. Emotional self-management is required for the attentional and problem-solving strategies necessary for effective cognitive performance, especially in tasks involving delay, inhibition, or the substitution of long-term goals for immediate incentives (e.g., Mischel and Mischel, 1977, 1983). They influence academic performance as they are enlisted in

managing performance stress, including test anxiety. Emotion management may also be significant during performance evaluations, especially for coping with the emotions engendered by academic successes and failures and their causal implications (e.g., Graham, 1991; Graham and Weiner, 1986), particularly as they relate to perceptions of competence and self-confidence. Finally, when children encounter distressing situations at home or elsewhere, their skills at emotional self-regulation may determine whether these situations impair academic performance or not (e.g., Hetherington, Cox, and Cox, 1982).

Finally, emotional regulatory processes are important because of their relevance to the study of child clinical disorders and their etiology and treatment. This is because many childhood disorders entail affective dimensions, and problems in emotional self-regulation define many behavioral problems of childhood and adolescence (e.g., Achenbach and Edelbrock, 1983). Moreover, as developmental psychopathologists have long recognized (cf. Rutter and Garmezy, 1983), understanding normative developmental processes such as those related to emotional regulation can provide added insight into the origins of early psychological disorders. The offspring of parents with depressive or bipolar disorders, for example, are themselves at risk for affective disorders, in part because of how the parent's disorder imposes demands on the child's nascent emotional self-regulatory capacities (see Zahn-Waxler and Kochanska, 1990). On the other hand, the study of Down Syndrome infants and children reveals how the physiological processes governing emotional regulation in normal and atypical populations can account for the more subdued, dampened emotionality of these children (Cicchetti, 1990; Thompson *et al.*, 1985). In each case, normative processes of emotional regulation figure prominently in understanding the origins and characteristics of these clinical disorders.

The relevance of emotional regulation to the understanding of child clinical disorders is especially apparent in the study of child maltreatment (e.g., Cicchetti, 1990). The socioemotional sequelae of maltreatment are apparent as early as infancy, and are especially manifested in disorders of emotional regulation. In Gaensbauer's evocative analyses, for example, abused or neglected infants observed in episodes of social interaction with a play partner displayed signs of regulatory dysfunction, including abrupt and unpredictable changes in mood, the "compartmentalization" of affect to specific eliciting conditions, shallowness, ambiguity, or ambivalence in emotional expressions, and infrequent expressions of pleasure (Gaensbauer, 1982; Gaensbauer and Mrazek, 1981; Gaensbauer and Sands, 1979). In my own preliminary re-analyses of these data, these infants have also exhibited a marked and generalized "shutting down" of affective responsiveness. In many respects, these infants are vulnerable owing either to precocious, en-

hanced capabilities in emotional management (what might be called "over-regulation" of emotion), or deficient abilities in coping with their emotional arousal. At older ages, maltreated children exhibit an acute sensitivity to aggressive stimuli, are more likely to perceive ambiguous situations as threatening, are more prone to angry, frustrated, and aggressive outbursts, and also exhibit socioemotionally withdrawn, avoidant behavior (see Aber and Cicchetti, 1984; and Cicchetti, 1990 for reviews). The origins of these disorders of emotional regulation are complex, but it is noteworthy that the parents of maltreated infants and children exhibit less positive and more negative emotion toward their offspring (e.g., Burgess and Conger, 1978; Lewis and Schaeffer, 1981) and, in particular, tend to misidentify and respond inappropriately to the affective expressions of young children (e.g., Frodi and Lamb, 1980; Kropp and Haynes, 1987). It seems likely, therefore, that through direct and indirect socialization processes, the emotional regulatory capabilities of infants and young children are shaped by the "emotional climate" of the home, for both maltreated and nonmaltreated populations.

Taken together, these research literatures indicate both that emotional arousal can serve valuable purposes in organizing and motivating adaptive behavioral processes, but that its capacity to do so depends, in part, on the processes by which emotion is itself monitored, evaluated, and modified by the individual. The development of these emotional regulatory processes — involving both extrinsic and emerging intrinsic capacities for managing emotional arousal — is a life-span process, involving an ongoing dialectic between the individual and the demands of the social surroundings. I now turn to an overview of some of the major influences on this developmental process.

BIOLOGICAL UNDERPINNINGS OF EMOTIONAL REGULATION

Normative Changes in Nervous System Functioning

As noted earlier, the management of emotion — whether through extrinsic influences or through self-regulation — is built upon systems of nervous system organization that have evolved to provide flexibility, efficiency, and control over emotive motivational processes. Some of these systems are immature at birth, and thus some of the neurological prerequisites of emotional regulatory processes are not fully functional early in infancy. Parents of young babies discover this to be true when, despite their concerted efforts to regulate the infant's arousal states, the newborn shifts unpre-

dictably and erratically from quiescence to heightened distress, and back again, and shows few genuine indicators of positive emotion.

Although surprisingly little is known about these emerging systems of nervous system organization, existing research indicates that two processes, occurring simultaneously, are related to the development of excitatory and inhibitory emotive processes early in infancy. First, diffuse *excitatory* processes are functionally active from birth but decline in lability throughout the first year, especially those related to adrenocortical activity (Gunnar, 1986; Gunnar *et al.*, 1991; Gunnar, Mangelsdorf, Larson, and Hertzgaard, 1989; Gunnar, Marvinney, Isensee, and Fisch, 1989). At the same time, parasympathetic activity assumes an important role in arousal regulation (Porges, 1991). As a consequence, organismic arousal gradually assumes less of the reactive, all-or-none character of the immediate postnatal period.

Second, cortical *inhibitory* controls over emotive systems emerge more slowly during infancy and may not become fully functional until long after birth. There appear to be at least two important transitions in their emergence, however. The first occurs at 2–4 months of age with the growth of rudimentary forebrain inhibitory centers, and this is reflected in behavioral state changes (e.g., the gradual suppression of neonatal reflexes, the emergence of more regular sleep–wake patterns, greater regularity and control of behavioral state, etc.), and emotional changes (e.g., an increase in exogenous smiling and a decline in unexplained fussiness, growing emotional responsiveness to contingent stimulation, and a capacity for laughter) (Emde, Gaensbauer, and Harmon, 1976; Sroufe and Wunsch, 1972; Watson, 1972; Watson and Ramey, 1972). This growing environmental responsiveness may have its roots in the emergence of rudimentary cortical inhibitory systems that exert regulatory control over fluctuations in behavioral state and permit the infant to attend and respond to situational events.

A second transition occurs at about 9–10 months of age, and is associated with developmental changes in frontal lobe activity and hemispheric specialization related to emotion. Diamond (1988a,b) has argued that a capacity for response inhibition emerges at this time because of the maturation of the frontal cortex (specifically the dorsal-lateral prefrontal cortex) which facilitates inhibitory control over initial response tendencies. As applied to cognitive processing, this enables infants to override initial response tendencies to permit memory-based approaches (such as those required for correct solution of Piaget's A-not-B problem) and goal-directed behavior. The same frontally-mediated inhibitory processes may also regulate excitatory processes related to emotional arousal (Dawson and Panagiotides, in press). In addition, there is considerable evidence that many cognitive and affective functions are cerebrally lateralized by this time

(see Kinsbourne and Hiscock, 1983), with relatively greater left frontal activation occurring in situations eliciting approach/positive emotionality, and relatively greater right frontal activation occurring in situations evoking withdrawal/negative emotion (Davidson and Fox, 1982; Fox and Davidson, 1987, 1988, 1991). Fox and Davidson (1984) have argued that right and left frontal lobes may increasingly exert mutual regulatory control during the 9- to 12-month period because of their connections to common subcortical structures, their growing functional maturity (cf. Diamond's work), and the maturation of transcollosal fibers during this period. Most notably, the left frontal cortex assists in the management of right hemispheric activation related to withdrawal/negative emotion, according to Fox and Davidson (1984; see also Tucker and Frederick, 1989). This is manifested not only in a greater capacity for emotional response inhibition but also in the emergence of more complex affective reactions (e.g., emotional blends).

Taken together, therefore, the first year of life witnesses the growth of emotional regulatory capacities owing both to the consolidation and stability of excitatory systems and the progressive maturation of cortical inhibitory processes, especially in the frontal lobe. Because the latter is an extended developmental process — lasting well into childhood (Fox and Davidson, 1984; Kinsbourne and Bemporad, 1984) — it appears that neurophysiological maturation contributes to the growth of emotional self-regulatory capacities in the early years of life, although considerably more research is required to confirm and extend this speculative analysis.

Individual Differences in Nervous System Reactivity

In addition to these normative developmental changes, researchers have also been interested in the neurophysiological processes governing individual differences in emotionality and emotional regulation. Much of this interest has centered on differences in temperament: variations in behavioral style that are presumed to have a constitutional and/or hereditary basis. Despite considerable differences in how theories define temperament, most temperamental theories underscore individual differences in emotionality, and at least one prominent theory (i.e., Rothbart and Derryberry, 1981) emphasizes the self-regulatory aspects of temperament (see Bates, 1987; Goldsmith, Buss, Plomin, Rothbart, Thomas, Chess, Hinde, and McCall, 1987 for reviews). To Rothbart and Derryberry, temperament consists of "constitutional differences in reactivity and self-regulation" (Derryberry and Rothbart, 1984, p. 132) in which positive and negative emotion and their regulatory features assume a prominent role (Derryberry and

Rothbart, 1984; Rothbart and Derryberry, 1981; Rothbart and Posner, 1985). In her infancy studies, for example, Rothbart has examined individual differences in smiling and laughter, fear, anger and frustration, and soothability in terms of regulatory response parameters such as latency, intensity, rise-time, and recovery of emotional reactions (e.g., Rothbart, 1981). In their theoretical work, Rothbart and her collaborators emphasize the neurophysiological, endocrinological, and other biological bases of temperamental individuality, but also underscore developmental changes in temperament as these systems mature and reorganize throughout the lifespan (see Rothbart and Posner, 1985).

There are emerging research findings elucidating the links between these neurophysiological processes and temperamental manifestations of emotional self-regulatory processes that give credence to this view. In particular, in his longitudinal study of behaviorally inhibited and uninhibited young children, Kagan has suggested that inhibited children have a generally lower threshold of reactivity in limbic structures mediating fear and defense (i.e., the amygdala and/or hypothalamus), and this is manifested in differences in autonomic measures (e.g., higher heart rate, salivary cortisol, and urinary epinephrine levels) and behavioral measures reflecting heightened fearful, wary, and shy behavior (see Kagan *et al.*, 1987 for a review). In a similar vein, Fox (1989a,b; Stifter and Fox, 1990) has compared groups of infants who differ on cardiac measures of autonomic functioning and found that infants with higher and more stable heart rates were emotionally less reactive and more wary in repeated assessments over the first 2 years of life, and he has interpreted these differences in terms of parasympathetic regulation (rather than sympathetic activation). Evidence adduced from each set of studies strongly suggests, therefore, that individual differences in physiological reactivity and regulation underlie significant differences in emotionality and its regulation, consistent with the views of temperamental theory. Furthermore, there is some evidence for the heritability of these individual differences in neurobehavioral functioning (Healy, Fox, and Porges, 1988).

Although these findings are provocative, they should not be interpreted as suggesting that individual differences in temperament or emotional regulation are unchanging or immutable because of their biological basis. As noted earlier, Kagan discovered that behavioral manifestations of infants' inhibition were influenced by caregivers' socialization efforts (Kagan *et al.*, 1987), and this observation is consistent with views underscoring the importance of the "goodness of fit" (Lerner and Lerner, 1983) or "match" (Buss and Plomin, 1984) between a child's temperamental characteristics and environmental demands. Furthermore, Dienstbier (1989) has argued that experiences of intermittent stress — such as those provided by mental

challenges, aerobic exercise, or other challenges to the individual — can alter the physiological systems governing emotional and stress reactions in humans by facilitating resistance to neuroendocrine depletion and by enhancing catecholamine capacity. As a consequence, these experiences not only foster better performance in future situations involving organismic activation, but can have long-term effects on emotional and personality functioning. Taken together, therefore, although individual differences in aspects of emotional regulation have important neurobiological constituents, there remains considerable flexibility to these differences arising from one's history of experiences.

EXTRINSIC REGULATION OF EMOTION IN INFANCY

Although young infants are capable of a limited repertoire of self-soothing behaviors (e.g., sucking on hands or fingers, visual avoidance, withdrawal, and rocking) (see Gianino and Tronick, 1988; Lipsitt, 1983; Kessen and Mandler, 1961), these behaviors have little effectiveness when elicitors persist or arousal is very high, and thus infants must rely on the assistance of caregivers to regulate their emotional arousal (Karraker and Lake, 1991). Adults can remove the source of distress when infants are incapable of doing so for themselves, and can provide other assists (e.g., a pacifier, a favorite toy, cuddling, etc.) that can foster the management of arousal (Campos, 1989). These interventions are the earliest ways in which emotion is extrinsically regulated, and they are important not only because of their immediate effects on the child's arousal, but also because they contribute to the socialization of emotional experience in accord with sociocultural beliefs about the suitability of different emotions and their expression and intensity that constitute the "emotional culture" (Gordon, 1989). Parents intervene into the emotional life of offspring, in other words, in accord with their personal beliefs and cultural values concerning emotion and its expression, and these interventions thus socialize emotional experience from infancy. And as we shall note below, the extrinsic regulation of emotion continues throughout life, although after infancy it is increasingly supplemented by the individual's own self-regulatory efforts. The individual also construes the effects of the emotional culture in idiosyncratic ways, and selects settings and demands that provide further support to emotional self-regulation.

Several modes of extrinsic emotional regulation appear earliest in infancy. These include the immediate and long-term effects of the caregiver's direct intervention strategies, the influence of selective reinforcement and modeling practices, the effects of affective induction on the child's emo-

tional experience, and the caregiver's control of opportunity for emotional arousal and its management.

Direct Intervention Strategies

Clearly, the promptness and efficacy of the caregiver's interventions — especially when the baby is distressed — influence the child's immediate emotional experience but may also affect the child's reliance on the caregiver for assistance on future occasions. As Lamb (1981a,b) has argued, "distress-relief sequences" are highly salient early experiences involving contingent associations between the infant's distress and the caregiver's ministrations. These characteristics make early experiences optimal learning opportunities for the development of social expectations. When caregivers respond promptly and contingently, the states of quiet alertness that result (Korner and Thoman, 1970, 1972) foster the child's conditioned association of the caregiver's cues with the relief of distress. Indirect evidence supporting this formulation comes from studies by Gekoski, Rovee-Collier, and Carulii-Rabinowitz (1983) and Lamb and Malkin (1986) showing that infants as young as 1–2 months old quieted in anticipation of the caregiver's assistance when hearing or seeing the adult's arrival before being picked up and comforted. Anticipatory quieting increased during the early months of life, and infants protested when the caregiver approached but did not pick up the baby. These findings are consistent with the view that social expectations concerning the adult's assistance are developing during this period. Indeed, these expectations probably underlie the child's stress-tolerance when the adult's assistance can be anticipated, which is a hallmark of a secure attachment (cf. Ainsworth, Blehar, Waters, and Wall, 1978; Lamb, Thompson, Gardner, and Charnov, 1985).

The caregiver's direct intervention strategies also may influence the regulation of emotion in another way. Insofar as infants experience a relatively consistent history of experiences concerning distress arousal and caregiver responsiveness, they may acquire distinct styles of emotional regulation based on the adult's intervention strategies and their effectiveness. For example, parents who regularly permit the child's distress to escalate to high levels before intervening not only reinforce the child's rapid escalation of distress intensity, but also may contribute to the child's more limited soothability (since highly distressed babies are more difficult to comfort). Conversely, caregivers who respond more immediately may foster the child's own emerging self-regulatory efforts by keeping the child's arousal within manageable limits through their own interventions.

The importance of direct intervention strategies extends beyond infancy. As children grow older, however, parents intervene in more differentiated ways to emotional expressions of offspring, and seek to regulate these expressions in accordance with the "emotional culture" (cf. Gordon, 1989; Miller and Sperry, 1987). For example, Brooks-Gunn and Lewis (1982) noted that over the first 3 years of the child's life, mothers became significantly more responsive to smiles, less responsive to frets and cries, and more responsive to nondistressed vocalizations of offspring — consistent with changing social expectations concerning the expression of positive and negative emotion by infants and preschoolers (see Lewis and Michalson, 1983). It is likely that parents also respond distinctively to expressions of distress, anger, fear, and other negative emotions over the same period. Moreover, their interventions are increasingly accompanied by meta-emotive messages (e.g., "big boys don't cry when they don't get what they want!") that shape the child's emerging representations of emotion and its regulation, as we shall see below. In these ways, therefore, direct intervention strategies remain important influences in the extrinsic regulation of emotion and its socialization.

Selective Reinforcement and Modeling

Not only distress but positive emotions are regulated in infancy as caregivers seek to enhance the latter while minimizing the former. One way to do so is through selective reinforcement and modeling of emotional behavior, which have been studied most frequently in the context of mother–infant face-to-face play interactions (Fogel, 1982; Gianino and Tronick, 1988; Tronick, Cohn, and Shea, 1986). These interactions are important arenas for the extrinsic regulation of emotion because play activity itself fosters heightened arousal that must be managed to maintain a pleasant encounter. For this reason, one of the caregiver's goals during face-to-face exchanges is to maintain an optimal level of arousal in the baby that sustains interest and pleasure without the child becoming overaroused and distressed. This is accomplished by monitoring the child's emotional and attentional cues and responding sensitively to signs of disinterest, distress, or fatigue (e.g., Brazelton, Koslowski, and Main, 1974: Field, 1981; Stern, 1974, 1977; Thompson and Lamb, 1983). The successful outcome of these efforts is not only pleasant play exchanges, but also the enhancement of the child's emerging capacities to cope with states of heightened excitement, or what one researcher has called "affective tolerance" (Fogel, 1982).

In microanalyses of mother–infant interaction, Malatesta (1990; Malatesta, Culver, Tesman, and Shepard, 1989; Malatesta, Grigoryev,

Lamb, Albin, and Culver, 1986; Malatesta and Haviland, 1982) has reported that when playing with their babies, mothers restricted their facial expressions primarily to positive emotions (e.g., enjoyment, interest, and surprise), and also imitated many infant facial expressions, especially those of positive emotions. In other words, infants who smiled were greeted with mothers who smiled in return; those who fussed had mothers who quickly acted to re-direct the baby's emotional response more positively. In this manner, it appears mothers sought to accentuate, modulate, and regulate their offspring's positive emotional experience in play. These patterns of selective reinforcement and modeling may help to explain the linear increase in positive emotional expressions observed in these babies as they grew older, as well as the similarity between mothers and infants in their expressive styles (Malatesta and Izard, 1984). Moreover, there is reason to believe that these interactive experiences also foster the child's nascent skills at emotional management by providing the baby with frequent experiences of heightened arousal that are maintained within the child's capacities to hope. As a consequence of experiences that foster "affective tolerance," in other words, the baby's tolerance of heightened arousal in other contexts may also be fostered.

Parents continue to use selective reinforcement and modeling as modes of extrinsic emotional regulation throughout a child's early years (cf. Miller annd Sperry, 1987). As noted earlier, parental approaches become more multifaceted, including verbal instruction, and more emotion-specific as the child matures. For example, parents' modeling and their expectations for the management of anger may lead some children to voice angry feelings with explosive words and gestures, others to become distressed, others to minimize the direct expression of anger, and still others to lose control in temper tantrums and other outbursts. Similar processes are likely to apply to how children learn to cope with feelings of disappointment, frustration, pride, and other emotions. In general, parents are more likely to reward self-controlled emotional displays than uncontrolled expressions, in accord with socialization goals related to the emotional culture. This makes emotional regulation and the regulation of emotional displays important socialization goals in childhood.

As these examples suggest, however, the consequences of parental selective reinforcement and modeling may sometimes be unintended. Zahn-Waxler and Kochanska (1990) have noted, for example, that (1) the offspring of depressed mothers often experience heightened guilt owing to the mother's modeling of negative attributional styles, and (2) that younger offspring have special difficulties in regulating interpersonal emotions like empathy and guilt because of their experiences with a depressed caregiver who exhibits negative affect and helplessness and who uses guilt-inductive

disciplinary practices. In such cases, the detrimental effects of parental reinforcement and modeling practices are combined with other emotional demands on the child that undermine rather than foster effective emotional regulation.

Affective Induction

Selective reinforcement and modeling may not alone affect the baby's emotional experience with the mother during episodes of face-to-face play. Another influence may be the emotional tone of the mother's behavior. Haviland and Lelwica (1987) reported that the facial expressions of 10-week-olds frequently matched the posed facial expressions of their mothers for emotions of joy and anger, and that their responses to maternal expressions of sadness were also distinctive. Termine and Izard (1988) similarly reported that 9-month-olds showed more joy, played more, and looked more at their mothers when mothers displayed positive emotion. They showed more sadness and anger and looked away when mothers displayed sadness. These provocative findings suggest that in these and other situations, a baby's emotional experience may be regulated by a variety of experiences of emotional contagion or induction in which a caregiver can influence, either deliberately or unintentionally, the child's emotional experience.

Affective induction as an extrinsic mode of emotional regulation can be observed not only in face-to-face play but in other interactive contexts during which caregivers provide an emotionally resonant response to the baby's emotional expressions (e.g., a resounding "yeah!" when the child smiles and exuberantly bangs on a drum). This has been called *affective attunement* by Stern (1985; Stern, Hofer, Haft, and Dore, 1985), who argues that it is sometimes used deliberately by the mother to enhance or dampen her child's emotional reactions. Another form of affective induction occurs in response to the child's specific efforts to obtain emotional cues from trusted adults. In *social referencing*, children deliberately look to familiar adults for information about how to evaluate an ambiguous or uncertain event, such as when encountering a friendly stranger (Campos and Stenberg, 1981; Feinman, 1982, 1985; Klinnert *et al.*, 1983). The emotional cues the child receives contribute to accentuating, dampening, redirecting, delaying, or otherwise altering the child's emotional and behavioral reactions to the event, often by arousing resonant emotion in the child. Social referencing can be observed in infants as young as 7 months of age. In our own laboratory research we have observed that it is sometimes deliberately employed by parents to alter the child's initial emotional reactions to uncertain situations. It is similar to how, in adults, emotional responses are

affected by the reactions of others to ambiguous events (e.g., reacting to an official's call at a hockey game).

Like the other modes of extrinsic emotional regulation, affective induction often can have complex and unanticipated consequences for young children, partly because children respond to a caregiver's emotional expressions with diverse emotional responses of their own, as indicated by the studies reviewed earlier. In a series of naturalistic home observations and laboratory studies, for example, Cummings and his colleagues (Cummings, 1987; Cummings, Iannotti, and Zahn-Waxler, 1985; Cummings, Zahn-Waxler, and Radke-Yarrow, 1981, 1984; Zahn-Waxler and Kochanska, 1990) observed that toddlers responded with distress, anger, and anxiety in the presence of adult expressions of anger. In one experimental study, young children were more likely to act aggressively toward an innocent peer when adults argued in the background, and convergent evidence suggested that this aggression was due to the effects of the adult's angry expressions on the child's emotional state (Cummings *et al.*, 1985). A follow-up study revealed that children's reactions depended also on the degree of marital discord in the child's own family (Cummings, Pellegrini, Notarius, and Cummings, 1989). This research is important because it suggests how the "emotional climate" of the home can significantly affect the regulation of a child's emotional experience through processes of affective induction similar to those described above. It also indicates other consequences for children growing up with parents who have depressive or bipolar disorders.

Control of Opportunity

Direct intervention strategies, selective reinforcement and modeling, and affective induction are ways parents regulate the emotions of offspring by influencing the circumstances in which they experience states of heightened emotional arousal. Although young children naturally have many opportunities to experience heightened distress, anger, joy, frustration, and other emotions, their emotional experience is further regulated by the ecological and caregiving conditions created by parents which significantly influence the frequency, regularity, persistence, and intensity of these opportunities. These caregiving conditions are constituted in many ways: they are affected by the socioeconomic circumstances of the family, the physical ecology of the home, the child-rearing values of the parents, and overarching cultural values concerning children and emotion, to name a few. In a sense, therefore, adults control many of the opportunities children have to experience and learn to cope successfully with heightened emotion.

This is an important contributor to the development of individual differences in emotional regulation in the early years of life, before children can exert significant control over their own settings and experiences.

Cross-cultural studies of early development reveal many examples of the control of opportunity, that is, parental efforts to regulate emotion in offspring by regulating the ecological circumstances provoking emotion. Cultural norms concerning child-rearing practices direct many features of a young child's early experiences, including disruptive or upsetting child-rearing procedures (e.g., early independence-training), regular or prolonged separations from the parent, the amount of stimulation provided the child (e.g., through the use of swaddling, cradleboards, etc.), the interpretation of the child's needs and emotions (e.g., through cultural portrayals of children as innocent or demanding that can influence parental responsiveness), the interpersonal density of the physical ecology, the use and quality of extrafamilial caregiving arrangements, and in many other ways. As noted in Caudill's classic studies (Caudill and Frost, 1975; Caudill and Weinstein, 1969), for example, the diminished emotional lability and expressiveness of Japanese infants compared to their American counterparts can be attributed to (1) the more soothing, pacifying style of Japanese mothers, (2) the small size of the Japanese home that promotes greater mother–infant proximity than in America, (3) the fact that it is culturally normative for Japanese mothers and babies to bathe together, sleep together, and engage in other physically intimate activities, and (4) the fact that the American custom of babysitting is practiced infrequently in Japan (Miyake, Campos, Kagan, and Bradshaw, 1986; Chen and Miyake, 1986). In these and other ways, young children develop skills of emotional regulation based on opportunities to experience and cope with states of heightened emotion in the ecological conditions parents provide.

Regulating emotion by controlling the ecological circumstances provoking emotion is a life-long strategy, but it becomes increasingly self-controlled with maturity. As adolescents and adults exercise greater control over their ecological settings and the emotional demands they experience within those settings (e.g., stresses from noisy neighbors or a crowded workplace), they become capable of better regulating the emotional demands of daily life. There is evidence that this becomes a very important component in the self-regulation of emotion in older adults. As Carstensen has argued, older adults increasingly select settings and relationships that conserve physical energy, maximize positive affect, and ensure manageable and predictable socioemotional demands (Carstensen, 1987, in press; Frederickson and Carstensen, 1990). In controlling the opportunities for experiencing heightened emotional arousal and its management, older adults create ecological settings that are emotionally congenial and supportive for them.

Summary

Although the rudiments of emotional self-regulatory capabilities are present in infancy, this period is predominated by the influence of caregivers' extrinsic modes of emotional regulation. The parent's direct intervention strategies, selective reinforcement and modeling, affective induction, and ecological control of opportunities to experience and regulate heightened emotion have life-long consequences. Caregivers continue to implement these practices in age-appropriate ways to foster the child's emotional self-control and to increasingly socialize emotion and its expression into the emotional culture. There remains quite a research agenda concerning these processes, and especially how they are applied in more discriminating and emotion-specific ways as children mature. Moreover, given the diversity of the settings in which infants and children are growing up — including day-care and family care homes, preschool and elementary school settings, and the "framed" settings of television and other media (Dorr, 1985) — our limited knowledge concerning their emotionally-regulating influences (and the concordance of these influences with those of parents) defines another important research challenge.

GROWTH OF INTRINSIC EMOTIONAL REGULATION IN THE TODDLER AND PRESCHOOL YEARS

In the years following infancy, caregivers remain significant influences on emotional regulation. But their contributions evolve together with the child's growing capacities for emotional self-regulation. Many of these changes are associated with the growth of language skills during the toddler and preschool years.

Language and the Extrinsic Regulation of Emotion

Language significantly alters how a child's emotional experience can be managed by caregivers because discourse about emotion becomes possible. Language may be an especially powerful mode for the extrinsic regulation of emotion because of its explicitness, its capacity for past and future reference (which enables adults to draw upon a history of shared experiences as well as to anticipate future events when conveying messages about emotion), and its multifaceted quality. As a consequence, children can receive influential verbal messages from adults concerning the circumstances requiring emotional regulation, the benefits of regulated emotion, the

strategies by which emotion may be regulated, the social rules governing emotional displays, and other information pertinent to emotion and its management. It is also striking how early these influences can be observed. Bretherton and her colleagues (Bretherton and Beeghly, 1982; Bretherton *et al.*, 1981, 1986; Dunn, Bretherton, and Munn, 1987) found that explicit reference to emotional experiences grew significantly after 18 months of age and that by the third year children made relatively frequent reference to internal states associated with emotion.

There are several ways this kind of verbal interaction can influence emotional regulation. First, parents can actively direct regulatory processes through verbal instruction, which can include exhortation ("Will you please calm down!"), threats ("You'll go to your room if you don't stop crying!"), and warnings of the consequences of unregulated emotion ("You'll get hiccups if you keep laughing so hard"). These messages not only have an immediate impact but also shape the child's understanding of emotion; children become keenly aware of the reasons for parents' efforts to direct the regulation of emotion and its expression in certain situations (Saarni, 1990). Second, parent–child discourse can also regulate emotion through the adult's management of information to the child, such as when children must face an uncomfortable or stressful experience that is explained and interpreted by the parent (e.g., a hospital procedure) (Miller and Green, 1985). Third, parents can use language to suggest explicit emotional regulatory strategies to the child, such as the value of distracting mental imagery, comforting self-talk, redirecting thoughts, using external distractors, re-defining goals and outcomes, and similar procedures. Fourth, discourse about emotion is also important as children overhear parents talk about their own emotional experiences. There is evidence that children learn about emotion and its management indirectly from these conversations (cf. Miller and Sperry, 1987). It is worth noting that discourse about emotion also assumes an important role in the understanding of emotional experience and its regulation in peer relationships at somewhat older ages (cf. Gottman and Mettetal, 1986).

Emotional Understanding and Emotional Self-Regulation

Language is important not only as a means of discourse about emotion with caregivers, however. In addition to its powerful role as an extrinsic regulator of emotion, language is important also as it shapes a child's own symbolic representations of emotion and emotional experiences. Indeed, language is developmentally significant in emotional self-regulation because the effects of parent–child discourse about emotion begin at a time when

children are themselves acquiring a conceptual network of emotion terms, concepts, and ideas, in short, a social-cognitive understanding of emotion. Language thus enhances the child's reflective consciousness of emotion, and this makes emotive processes themselves the subject of reflection and analysis. In its most specific applications, language becomes an early mode of direct emotional self-regulation, such as in the self-coaching of young children in emotionally demanding situations (exemplified by the toddler who is overheard saying during a brief separation, "Mommy will come back. She said she would come back"; Smolek and Weinraub, 1979).

More broadly, however, the growth of representational skills related to emotion provides the basis for the earliest cognized strategies of emotional regulation, which are part of the child's *meta-emotive understanding*, or knowledge of emotional processes (Thompson, 1990). Once children begin to acquire knowledge of emotion and its constituents, in other words, their capacity to identify and implement strategies of emotional regulation begins to emerge. One reason is that an understanding of emotion sensitizes children to the various targets of regulatory influence (e.g., one's sensory experience in emotionally-arousing circumstances, the reactions of others to one's emotional displays, the nature of the conditions that arouse emotion, internal psychological processes related to emotion, etc.). Moreover, emotional understanding also enables children to reflect on the origins and consequences of emotional arousal and its expression, and this can motivate and direct self-regulatory efforts. Thus, the growth of emotional understanding and knowledge of the regulation of emotion develop in tandem, and their origins are in the child's earliest conceptual representations of emotion during the preschool years.

According to Meerun Terwogt and Olthof (1989), there are several components to children's metaemotive understanding that assist them in their emotional regulatory efforts. First, there is the child's understanding of the antecedents of emotion, or the associations between specific situations and the emotional reactions they provoke. This kind of knowledge emerges very early: before 3 1/2 years of age, children can accurately identify situations that elicit simple emotional reactions like happiness, sadness, anger, and fear (Borke, 1971; Harter, 1982a; Mood, Johnson, and Shantz, 1978; Trabasso, Stein, and Johnson, 1981; see also Barden, Zelko, Duncan, and Masters, 1980; Harris, Olthof, Meerum Terwogt, and Hardman, 1987). The emotional lexicon expands significantly in the years that follow (Harter, 1982a, Ridgeway, Waters, and Kuczaj, 1985; Russell and Ridgeway, 1983; Schwartz and Trabasso, 1984), and children can increasingly discriminate between the different causal antecedents of emotion (e.g., Graham and Weiner, 1986; Thompson, 1987, 1989; Weiner and Graham, 1984), including distinguishing between psychological and situational determinants of

emotion (e.g., Gnepp and Chilamkurti, 1988; Gnepp and Gould, 1985; Harris, 1983; Stein and Trabasso, 1989).

Thus, early emotional concepts are behaviorally-based, simple, and limited in depth and scope. As children increasingly acquire broader, more sophisticated, psychologically-based emotion concepts, their knowledge of the diverse origins and regulatory influences of emotion expands. For example, an early understanding of pride that is based primarily on positive outcomes develops into a more mature conception that depends on positive outcomes that are based on one's own deliberate efforts (Stipek, 1983; Thompson, 1987, 1989). Similarly, children begin to understand that guilt is warranted not just when bad things happen, but when one is responsible for them (Thompson, 1987, 1989).

A second component of meta-emotive understanding is knowing the consequences of an emotional response. There are two aspects of this understanding. The first concerns knowing the consequences of an emotional display, which is related to how children understand the sociocultural rules governing emotional expressions. As Saarni (1979, 1989, 1990) has shown, children in the early grade-school years become aware that emotional displays should be regulated to avoid hurting another's feelings or being personally embarrassed, and to get attention, elicit sympathy, or obtain help from others. There is additional evidence that even children as young as age 4 can use emotional display rules appropriately, even when they cannot verbalize their strategy or reasons for using them (Cole, 1986). Thus, one reason for emotional regulation is because children know the consequences of unregulated emotional displays (see Fuchs and Thelen, 1988). Children and adults seek to regulate emotional arousal in order to manage its expression.

But children and adults also strive to regulate emotion independently of its social consequences. Unpleasant emotional states are managed because of their subjective discomfort; emotions like anger, fear, or frustration are regulated, at times, because they can undermine effective functioning. Thus, knowing the consequences of an emotional response includes knowing the consequences of emotional arousal. We know relatively little about how this aspect of meta-emotive understanding develops. In one study, children from the age of 6 (the earliest age studied) were aware that they perceived others more positively when they were in a positive mood, and that negative emotion impaired task performance (Harris, Olthof, and Meerum Terwogt, 1981). From the late preschool years, children are also aware that happiness instills generosity, anger diminishes self-control, and sadness as well as anger dampens self-gratification (Masters and Carlson, 1984). But this aspect of children's meta-emotive knowl-

edge deserves further study, primarily because of its significance for managing emotional experience.

A third component of meta-emotive understanding is children's knowledge of the strategies of emotional self-regulation. There has been considerable research on children's awareness of these strategies, although it relies largely on self-report and, in light of Cole's (1986) provocative findings reviewed earlier, it is important to enlist nonverbal performance measures in future studies with young children. Even so, current findings indicate that during the preschool years, children rely largely on a few very simple approaches to managing their own emotional experience. Preschoolers can alter their emotional experience by regulating sensory intake (e.g., covering the eyes or ears) (Bretherton *et al.*, 1981). Sometimes they simply ignore an emotionally-arousing stimulus, even when it is personally threatening, or leave the situation, or otherwise restrict information-intake (Cummings, 1987). Preschoolers also attempt to manage their emotional arousal by seeking nurturance from trusted adults (Masters, Ford, and Arend, 1983; McCoy and Masters, 1985), or by using encouraging or reassuring self-talk (Smolek and Weinraub, 1979). At times, of course, they simply remove or avoid emotionally arousing situations. There is also some evidence that preschoolers can manage emotional arousal by altering or substituting goals for the situation (e.g., playing by oneself instead of a frustrating peer), but this is a limited capability at young ages (Stein and Levine, 1989; Stein and Trabasso, 1989). Finally, there is limited evidence that preschoolers understand that the intensity of an emotion wanes over time (and thus that "time heals all ills"), especially if emotionally arousing circumstances change. But they appreciate also that emotion can have long-term effects depending, in part, on the intensity of the initial experience of emotional arousal (Harris, 1983; Harris, Guz, Lipian, and Man-Shu, 1985).

Taken together, these developmental achievements in how young children understand the strategies for emotional self-regulation are consistent with their evolving understanding of emotion itself. Emotion is perceived as something that exists primarily in situations and in behavior; regulatory efforts that change situations, reduce their influence (e.g., by restricting sensory- and information-intake), or alter one's behavior in those situations are the regulatory avenues of first resort to the preschooler.

STRATEGIC EMOTIONAL SELF-REGULATION IN MIDDLE CHILDHOOD

During the grade-school years, children's understanding of emotion evolves to encompass the psychological, attributional, and motivational

complexities of emotional experience (Harris and Olthof, 1982). This should be unsurprising in view of several other developmental achievements during these years. Children are acquiring psychologically-oriented conceptions of self and other that provide a basis for a more sophisticated representation of emotional experience (Damon and Hart, 1982; Shantz, 1983). Cognitive achievements in the appearance/reality distinction (Flavell, Flavell, and Green, 1983), representational flexibility in applying multiple perspectives to a single event (Fischer, 1980; Fischer, Shaver, and Carnochan, 1989), and growth in social knowledge and role-taking skills have important implications for children's understanding of (1) emotional display rules, (2) the multiple dimensions of emotional experience and the simultaneity of different emotions, and (3) the consequences of one's emotional expressions for social partners. For example, they understand better the causal implications of different emotional experiences (e.g., that pride reflects success owing to one's efforts, sympathy for another derives from their lack of success owing to inability etc.) (Graham, 1991). Added to these influences is the catalyst of peer interactions, which become increasingly oriented toward psychological compatibility and emotional intimacy during middle childhood (Selman, 1980). As a consequence, children acquire and enlist a broad variety of emotional self-regulatory strategies for managing immediate emotional reactions to emotionally salient peer encounters, especially those that place the child at heightened risk for being exposed or embarrassed (Gottman and Mettetal, 1986). In peer encounters as well as in other social situations, the skills of emotional self-regulation are enlisted for strategic personal and social ends.

Not surprisingly, therefore, the repertoire of strategies for emotional self-regulation expands significantly in size and complexity during middle childhood. During this period, for example, children understand that emotional experience can be altered by internal emotional re-direction (e.g., thinking happy thoughts in a sad situation) (Altshuler and Ruble, 1989; Band and Weisz, 1988; Carroll and Steward, 1984; Harris *et al.*, 1981), or by redirecting attention or deliberate distraction (Altshuler and Ruble, 1989; Band and Weisz, 1988; Harris and Lipian, 1989). In a related vein, Mischel's research has shown that children at this time can manage emotional arousal in incentive conditions through emotion-blunting ideation or by focusing on the benefits of regulation (or the costs of unregulation; Mischel and Mischel, 1977, 1983). Emotional experience can also be altered by reinterpreting or re-defining the situation to dampen or enhance arousal (e.g., thinking "it's just a story" when listening to a sad account) (Meerum Terwogt, Schene, and Harris, 1986). At times, grade-school children alter emotion by acting in a way that provokes a different emotion (e.g., playing with toys when feeling anxious) (Altshuler and Ruble, 1989; Harris and

Lipian, 1989: Harris *et al.*, 1981). In middle childhood, children are also aware that emotional expressions to others can be dissociated from internal emotional experience and, by implication, one can manage emotion by altering the reactions of others to oneself (e.g., appearing brave before a threatening bully) (Harris, Donnelly, Guz, and Pitt-Watson, 1986; Gross and Harris, 1988; Harris and Gross, 1989; Harris and Lipian, 1989; Harris *et al.*, 1981; Saarni, 1979, 1984; Selman, 1981; Taylor and Harris, 1984).

Other aspects of emotional understanding that emerge during middle childhood are also relevant to emotional self-regulation. During this time, for example, children become aware that different emotions can be experienced either sequentially or simultaneously, and that when emotions are differently valenced they can sometimes produce ambivalence or emotional conflict (Carroll and Steward, 1984; Donaldson and Westerman, 1986; Harris, 1983; Harris and Lipian, 1989; Harter, 1982a,b; Harter and Buddin, 1987; Meerum Terwogt, Koops, Oosterhoff, and Olthof, 1986a). They are aware of some of the causal ascriptions underlying emotional arousal, and know that changing attributions of causality can have different emotional consequences (e.g., "You shouldn't be mad at your little brother — he didn't mean it!") (Graham and Weiner, 1986; Thompson, 1987, 1989; Weiner and Graham, 1984). Finally, they understand that emotion can be re-evoked if one recalls memories of an earlier emotional experience, whether positive or negative in valence (Harris *et al.*, 1985).

Taken together, this burgeoning repertoire of strategies reflects the grade-schooler's appreciation of the multifaceted features of emotional experience that entail manipulable psychological, attributional, and social inferential processes. In a sense, these achievements reflect the growth of emotional autonomy as well as the management of emotional experience because children depend less on the situational instigators and external regulators of emotion, and they can maintain satisfying emotional well-being more independently and self-directedly (Cole and Kaslow, 1988).

As earlier noted, however, most of these studies rely on children's verbal self-report in response to hypothetical story scenarios involving emotional regulation. We know disappointingly little about how these regulatory strategies are actually implemented in real situations. The results of one study suggest that when actual emotional arousal is intense, the capacity of children to devise and apply emotional self-regulatory strategies may be more limited. Harris and Lipian (1989) interviewed 10-year-olds who were hospitalized for a variety of acute conditions, and they discovered that their evocation of strategies for emotional management was impoverished compared with that of nonhospitalized children of the same age. Harris and Lipian concluded that the negative emotions associated with hospitalization "flooded" children's perceptions of their conditions, blunting their capacity

to regulate their own affect and accounting for the deficits observed in children's reports of emotional regulatory strategies. However, hospitalized children may also have had a more realistic sense of the limited range of self-regulatory strategies that were likely to prove effective in their circumstances. This is a finding, therefore, that deserves further exploration beginning with a series of investigations of self-regulatory processes in actual emotionally arousing situations.

On the whole, however, these striking advances in meta-emotive understanding provide an important foundation for the systems of emotion knowledge — or emotion prototypes — by which mature conceptions of emotion seem to be organized (Fischer *et al.*, 1989: Shaver, Schwartz, Kirson, and O'Connor, 1987). Indeed, many significant components of emotion prototypes — concerning the antecedents of emotion, the consequences of an emotional response and its display, and the strategies of emotional self-regulation — are initially constituted in the earliest forms of meta-emotive understanding in the preschool years, and are significantly deepened and elaborated as a consequence of the developmental achievements of middle childhood.

A THEORY OF PERSONAL EMOTION IN ADOLESCENCE

Along with the growth of psychologically-oriented conceptions of emotion and emotional regulation, middle childhood also witnesses the growth of self-understanding that provides children with insight into their own emotive processes, distinct from those of others. Early in the grade-school years, if not during the preschool period, children become aware that their own emotional experiences are different from those of others in important ways. A child may discover that he does not enjoy roller-coaster rides or scary movies as much as his friends do, or that it takes her longer to feel comfortable with unfamiliar people than it does others, but that there are things she can do to facilitate this process. In other words, while they are acquiring general knowledge about emotive processes, children are also learning about emotive processes that are more idiosyncratic to themselves. This constitutes the basis for a *theory of personal emotion:* an understanding of how emotion functions and is managed within oneself.

It is easy to see why the rudiments of a theory of personal emotion would emerge early in life, and why children would be motivated to enlarge this form of self-understanding. Emotional experiences are salient and significant catalysts for social functioning and behavioral self-management, and thus a capacity to understand and predict how one will react emotionally to commonly-occurring situations would enable children to act more

competently and confidently. In addition, an appreciation of the emotional self-regulatory strategies that are particularly effective in one's own experience — whether they entail the use of mental imagery or listening to favorite music — would further enable children to enlist their emotions in more productive and useful ways in their ongoing interactions with the social and nonsocial world. For these reasons, it is unsurprising that one can find clues to the early emergence of rudiments of such a theory in some of the studies cited above. For example, in his study of behaviorally inhibited children, Kagan and his colleagues (1987) quote one of their children who said to his mother at age 5 1/2: "I know I am afraid, but I'm trying not to be."

For the same reasons, however, it is clear that a theory of personal emotion achieves significant coherence and consistency primarily during adolescence. It is during the teenage years that individuals are constructing a network of self-referent beliefs that are psychologically more complex, differentiated, and integrated than those that existed in earlier years. It thus seems likely that during this period, the theory of personal emotion is shaped by other elements of the self-system and provides an important contribution to emerging self-understanding. Moreover, as this "theory" becomes progressively refined during the adolescent and young adult years, it becomes part of the network of self-schemas (Markus, 1977) that organize self-understanding in maturity. As a consequence, emotional self-understanding is a contributor to and is shaped by other aspects of self-awareness that become consolidated during adolescence.

EMOTIONAL SELF-REGULATION IN THE ADULT YEARS

The developmental research literature has little to say about further growth in emotional self-regulation in maturity. Indeed, prevailing debates over whether the general quality of emotional experience changes (especially in later life) — and if so, what are its causes — remain essentially unresolved (cf. Malatesta, 1981). However, it is possible to identify (albeit speculatively) several general themes to the self-regulation of emotion during the adult years.

First, it is likely that emotional experience becomes regulated in increasingly idiosyncratic ways, depending on (1) the individual's goals for regulating emotion, (2) the "theory of personal emotion" by which self-regulatory efforts are organized, and (3) the demands of the social setting (Labouvie-Vief, Hakim-Larson, DeVoe, and Schoeberlein, 1989). Indeed, Labouvie-Vief and colleagues (1989) have proposed that with increasing

maturity, individuals are less constrained by the conventional demands of the emotion culture and increasingly regulate emotional experience according to personal goals and a recognition of the need to maintain a vibrant, unique subjective emotional experience. It seems likely that a history of experiences of emotional self-regulation culminates by the adult years in the development of an effective repertoire of strategies that are enlisted in creating a more unique, personalized emotional life.

Second, it is likely that emotional self-regulation becomes increasingly organized in emotion-specific ways. As the demands of emotional experience and the dictates of the emotional culture increasingly focus on discrete emotions in older individuals, self-regulatory strategies are likely to become more emotion-specific. Thus it is likely that mature individuals develop differentiated regulatory strategies for the management of anger, anxiety, guilt, and other emotions, using distracting ideation for some emotions, intellectualization for others, and avoiding emotionally-arousing circumstances for still other emotions.

Third, and finally, it is likely that with increasing age, emotional self-regulation is based not only on differentiated strategies of self-regulation, but also on regulating the emotional demands of the environment, both interpersonal and inanimate. As Carstensen's (1987, in press; Frederickson and Carstensen, 1990) research reviewed earlier seems to indicate, in later life, adults exercise greater selectivity in their social relationships, choosing those that ensure predictable and manageable emotional demands and that heighten positive affect. Indeed, one of the themes of later-life developmental theories is the selectivity older adults exercise in their interpersonal and ecological settings to construct congenial and manageable life experiences. Thus, insofar as they are capable of exercising such control over their environments, older adults are likely to regulate their emotional experiences by regulating the interpersonal density, noise, privacy intrusions, and other demands of their settings, and the emotional consequences of these demands. And whereas younger children try to regulate emotion by restricting information intake, older adults can manage emotional arousal by restructuring their schedules (e.g., clearing the schedule for a midafternoon "time out") escaping from the situation (e.g., by a spontaneous or planned vacation), or retiring to a private place. This reflects that the maintenance of satisfying emotional well-being in the adult years is fostered both by an elaborate repertoire of emotional self-regulatory strategies and by the ability to regulate the extrinsic demands on one's emotional life, in the context of striving to create a more personalized, unique quality of subjective experience.

CONCLUSION

The study of emotional regulation poses fascinating and significant challenges to the educational psychologist because of the multidimensional quality of emotional experience and the numerous catalysts to the growth of extrinsic and self-regulatory processes throughout the life-span. This research review is both a conceptual outline and an empirical challenge: it is not hard to find important domains of underresearched topics described above as well as suggestions for further inquiry. In many respects, the significance of emotional regulatory processes for subjective well-being at various phases of life underscores the importance of future research.

This is especially true during the school years, in educational as well as in extracurricular contexts. Although establishing applications from this research to how parents and teachers can facilitate children's learning, achievement, and competence in school is a bit premature, some speculative implications can be identified. For example, Mischel's research (Mischel and Mischel, 1977, 1983) strongly suggests that children during this period can enlist emotional self-regulatory strategies offered by an adult that will improve their performance in tasks involving delayed rewards and the inhibition of initial response tendencies. These are skills that assume an important role in certain kinds of problem-solving tasks. Emotional self-regulation in these contexts is fostered by deliberate strategies involving distracting ideation or, alternatively, focusing on the rewards of delay or inhibition. These can be fostered by direct instruction (coaching), modeling, or in other ways.

In other situations, learning can be encouraged by equipping children with emotional self-regulatory strategies that enable them to cope better with the frustrations of initial task failures or performance anxiety (e.g., through self-coaching, re-directing attributions, or reinterpreting the failure) and which promote continued interest in the task. Indeed, such strategies may have the added benefit of fostering the child's intrinsic motivation related to task performance, which is an important contributor to academic success (Lepper, 1988). More broadly, students' perceptions of their own competence in academic and non-academic situations involves, among other things, the capacity to attend to appropriate indications of their skills in the context of performance evaluations, social-comparison information, and other criteria, and to manage the emotions engendered by their success and failure experiences. Developmental changes in children's perceptions of competence are related to changes in their attention to relevant criteria of their skills (especially at earlier ages) and changes in their management of achievement-related emotions,

which may be especially significant during the junior-high years (cf. Connell, 1985; Harter, 1982c; Harter and Pike, 1984). This is a topic of developmental study meriting further research.

In addition to fostering students' emotional self-regulatory efforts in achievement situations, parents and teachers may also strive to enhance learning and achievement by extrinsic modes of emotional regulation. Attributional theory and derivative research indicate that the emotional dimensions of performance feedback alter children's perceptions of the causes of their success or failure experiences. These perceptions affect, in turn, future efforts to succeed. For example, performance evaluations accompanied by emotions like sympathy imply that failure is due to inability, but emotions like anger suggest that failure is due to lack of effort, with the implication that one can succeed in the future by trying harder (e.g., Graham, 1991). Teachers and parents may directly influence a child's achievement motivation, therefore, through the emotional responses they provide to the child's successes and failures. Reacting to a student's failure with annoyance rather than pity implies that the child is capable of performing well contingent on added effort and is consistent with encouragement to the child to try harder.

Furthermore, the child's causal ascriptions for success and failure can also be altered by influencing the child's *own* emotional responses to these experiences. Encouraging feelings of pride in academic success, for example, fosters the child's perception that she is responsible for her success, whereas children who feel grateful or surprised for their success are less likely to experience the same sense of personal responsibility for doing well. Similarly, encouraging children to feel guilty (or, perhaps, angry at themselves) for academic failure implies that the causes of failure are remediable and controllable, which is not true of failure-based reactions like hopelessness or resignation. In short, the causal interpretations of success and failure experiences in academic situations are profoundly affected by emotional reactions to these experiences, both by authorities and by oneself. These can be a significant target of extrinsic strategies of emotional regulation that can affect students' striving for success in future tasks.

The study of emotional regulation thus has potentially valuable applications to educational concerns as well as to other situations that affect personal well-being. Elucidating these applications, as well as the developmental pathways leading to the skills of emotional self-regulation, becomes an important task for theory and research.

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REFERENCES

Aber, J. L., and Cicchetti, D. (1984). The socio-emotional development of maltreated children: An empirical and theoretical analysis. In Fitzgerald, H. R., Lester, B. M., and Yogman, M. W. (eds.), *Theory and Research in Behavioral Pediatrics* (Vol. 2), Plenum, New York, pp. 147-205.

Achenbach, T. M. and Edelbrock, C. (1983). *Manual for the Child Behavior Checklist*, Queen City Printers, Burlington, Vermont.

Ainsworth, M. D. S., Blehar, M. C., Waters, E., and Wall, S. (1978). *Patterns of Attachment*, Erlbaum, Hillsdale, New Jersey.

Altshuler, J. L., and Ruble, D. N. (1989). Developmental changes in children's awareness of strategies for coping with uncontrollable stress. *Child Dev.* 60: 1337-1349.

Band, E., and Weisz, J. R. (1988). How to feel better when it feels bad: Children's perspectives on coping with everyday stress. *Dev. Psychol.* 24: 247-253.

Barden, R. C., Zelko, F. A., Duncan, S. W., and Masters, J. C. (1980). Children's consensual knowledge about the experiential determinants of emotion. *J. Person. Soc. Psychol.* 39: 968-976.

Barrett, K. C., and Campos, J. J. (1987). Perspectives on emotional development II: A functionalist approach to emotions. In J. D. Osofsky (ed.), *Handbook of Infant Development* (2nd Ed.), Wiley, New York, pp. 555-578.

Bates, J. E. (1987). Temperament in infancy. In J.D. Osofsky (ed.), *Handbook of Infant Development* (2nd Ed.), Wiley, New York, pp. 1101-1149.

Borke, H. (1971). Interpersonal perception of young children: Egocentrism or empathy? *Dev. Psychol.* 5: 263-269.

Brazelton, T. B., Koslowski, B., and Main, M. (1974). The origins of reciprocity: The early mother-infant interaction. In Lewis, M., and Rosenblum, L. (eds.). *The Effects of the Infant on Its Caregiver,* Wiley, New York, pp. 49-76.

Bretherton, I., and Beeghly, M. (1982). Talking about internal states: The acquisition of an explicit theory of mind. *Dev. Psychol.* 18: 906-921.

Bretherton, I., McNew, S., and Beeghly-Smith, M. (1981). Early person knowledge as expressed in gestural and verbal communication: When do infants acquire a "theory of mind"? In Lamb, M.E., and Sherrod, L.R. (eds.), *Infant Social Cognition,* Erlbaum, Hillsdale, New Jersey, pp. 333-373.

Bretherton, I., Fritz, J., Zahn-Waxler, C., and Ridgeway, D. (1986). Learning to talk about emotions: A functionalist perspective. *Child Dev.* 57: 529-548.

Brooks-Gunn, J., and Lewis, M. (1982). Affective exchanges between normal and handicapped infants and their mothers. In Field, T., and Fogel, A. (eds.), *Emotion and Early Interaction,* Erlbaum, Hillsdale, New Jersey, pp. 161-188.

Burgess, R. L., and Conger, R. D. (1978). Family interaction in abusive, neglectful, and normal families. *Child Dev.* 49: 1163-1173.

Buss, A. H., and Plomin, R. (1984). *Temperament: Early Developing Personality Traits,* Erlbaum, Hillsdale, New Jersey.

Campos, J. J., and Stenberg, C. C. (1981). Perception, appraisal and emotion: The onset of social referencing. In Lamb, M.E., and Sherrod, L.R. (eds.), *Infant Social Cognition,* Erlbaum, Hillsdale, New Jersey, pp. 273-314.

Campos, J. J., Barrett, K. C., Lamb, M. E., Goldsmith, H. H., and Stenberg, C. (1983). Socioemotional development. In Mussen, P.H. (ed.); Haith, M. M., and Campos, J.J. (Vol. eds.). *Handbook of Child Psychology* (Vol. II): *Infancy and Developmental Psychobiology,* Wiley, New York, pp. 783-915.

Campos, J. J., Campos, R. G., and Barrett, K. C. (1989). Emergent themes in the study of emotional development and emotional regulation. *Dev. Psychol.* 25: 394-402.

Campos, R. G. (1989). Soothing pain-elicited distress in infants with swaddling and pacifiers. *Child Dev.* 60: 781-782.

Carroll, J. J., and Steward, M. S. (1984). The role of cognitive development in children's understandings of their own feelings. *Child Dev.* 55: 1486-1492.

Carstensen, L. L. (1987). Age-related changes in social activity. In Carstensen, L. L., and Edelstein, B. A. (eds.), *Handbook of Clinical Gerontology,* Pergamon, New York, pp. 222-237.

Carstensen, L. L. (in press). Selectivity theory: Social activity in life-span context. In Schaie, K.W. (ed.). *Annual Review of Geriatrics and Gerontology,* Springer, New York.

Caudill, W., and Frost, L. (1975). A comparison of maternal care and infant behavior in Japanese–American, American, and Japanese families. In Bronfenbrenner, U., and Mahoney, M. A. (eds.), *Influences on Human Development* (2nd ed.), Dryden, Hinsdale, Illinois, pp. 329-342.

Caudill, W., and Weinstein, H. (1969). Maternal care and infant behavior in Japan and America. *Psychiatry* 32: 12-43.

Chen, S.-J., and Miyake, K. (1986). Japanese studies of infant development. In Stevenson, H., Azuma, H., and Hakuta, K. (eds.), *Child Development and Education in Japan,* Freeman, New York, pp. 135-146.

Cicchetti, D. (1990). The organization and coherence of socioemotional, cognitive, and representational development: Illustrations through a developmental psychopathology perspective on Down syndrome and child maltreatment. In Thompson, R. A. (ed.), *Socioemotional Development. Nebraska Symposium on Motivation* (Vol. 36), University of Nebraska Press, Lincoln, Nebraska, pp. 259-366.

Cole, P. M. (1986). Children's spontaneous control of facial expression. *Child Dev.* 57: 1309-1321.

Cole, P. M., and Kaslow, N. J. (1988). Interactional and cognitive strategies for affect regulation: Developmental perspective on childhood depression. In Alloy, L. (ed.), *Cognitive Processes in Depression,* Guilford, New York, pp. 310-341.

Connell, J. P. (1985). A new multidimensional measure of children's perceptions of control. *Child Dev.* 56: 1018-1041.

Cummings, E. M. (1987). Coping with background anger in early childhood. *Child Dev.* 58: 976-984.

Cummings, E. M., Zahn-Waxler, C., and Radke-Yarrow, M. (1981). Young children's responses to expressions of anger and affection by others in the family. *Child Dev.* 52: 1274-1282.

Cummings, E. M., Zahn-Waxler, C., and Radke-Yarrow, M. (1984). Developmental changes in children's reactions to anger in the home. *J. Child Psychol. Psychiat.* 25: 63-74.

Cummings, E. M., Iannotti, R. J., and Zahn-Waxler, C. (1985). Influence of conflict between adults on the emotions and aggression of young children. *Dev. Psychol.* 21: 495-507.

Cummings, J. S., Pellegrini, D. S., Notarius, C. I., and Cummings, E. M. (1989). Children's responses to angry adult behavior as a function of marital distress and history of interparent hostility. *Child Dev.* 60: 1035-1043.

Damon, W., and Hart, D. (1982). The development of self-understanding from infancy through adolescence. *Child Dev.* 60: 841-864.

Davidson, R. J., and Fox, N. A. (1982). Asymmetrical brain activity discriminates between positive and negative affective stimuli in human infants. *Science* 218: 1235-1237.

Dawson, G., and Panagiotides, H. (in press). The role of frontal lobe functioning in the development of infant self-regulatory behavior. *Brain Cognition.*

Derryberry, D., and Rothbart, M. K. (1984). Emotion, attention, and temperament. In Izard, C. E., Kagan, J., and Zajonc, R. B. (eds.), *Emotions, Cognition and Behavior,* Cambridge University Press, Cambridge, pp. 132-166.

Diamond, A. (1988a). Abilities and neural mechanisms underlying AB performance. *Child Dev.* 59: 523-527.

Diamond, A. (1988b). Differences between adult and infant cognition: Is the crucial variable presence or absence of language? In Weiskrantz, L. (ed.), *Thought Without Language,* Oxford University Press, Oxford, pp. 337-370.

Dickstein, S., Thompson, R. A., Estes, D., Malkin, C., and Lamb, M. E. (1984). Social referencing and the security of attachment. *Infant Behav. Dev.* 7: 507-516.

Dienstbier, R. A. (1989). Arousal and physiological toughness: Implications for mental and physical health. *Psychol. Rev.* 96: 84-100.

Dodge, K. A. (1991). Emotion and social information processing. In Garber, J., and Dodge, K. (eds.), *The Development of Emotion Regulation and Dysregulation,* Cambridge, New York, pp. 159-181.

Dodge, K. A., Pettit, G. S., McClaskey, C. L., and Brown, M. M. (1986). Social competence in children. *Monographs Soc Res. Child Dev.* 51 (Serial no. 213).

Donaldson, S. K., and Westerman, M. A. (1986). Development of children's understanding of ambivalence and causal theories of emotions. *Dev. Psychol.* 22: 655-662.

Dorr, A. (1985). Contexts for experience with emotion, with special attention to television. In Lewis, M., and Saarni, C. (eds.), *The Socialization of Emotion,* Plenum, New York, pp. 55-85.

Dunn, J., Bretherton, I., and Munn, P. (1987). Conversations about feeling states between mothers and their young children. *Dev. Psychol.* 23: 132-139.

Emde, R. N., Gaensbauer, T. J., and Harmon, R. J. (1976). *Emotional expression in infancy: A biobehavioral study. Psychol. Issues* 10 (Monograph 37).

Fagan, J. W., Ohr, P. S., Fleckenstein, L. K., and Ribner, O. R. (1985). The effect of crying on long-term memory in infancy. *Child Dev.* 56: 1584-1592.

Feinman, S. (1982). Social referencing in infancy. *Merrill*-Palmer Q. 28: 445-470.

Feinman, S. (1985). Emotional expression, social referencing, and preparedness for learning in infancy — Mother knows best, but sometimes I know better. In Zivin, G. (ed.). The Development of Expressive Behavior, Academic, Orlando, Florida, pp. 291-318.

Field, T. (1985). Infant arousal, attention and affect during early interactions. In Lipsitt, L. P. (ed.), *Advances in Infancy Research* (Vol. 1), Ablex, Norwood, New Jersey, pp. 57-100.

Fischer, K. W. (1980). A theory of cognitive development: The control and construction of hierarchies of skills. *Psychol. Rev.* 87: 477-531.

Fischer, K. W., Shaver, P., and Carnochan, P. (1989). A skill approach to emotional development: From basic- to subordinate-category emotions. In Damon, W. (ed.), *Child Development Today and Tomorrow* (New Directions for Child Development Series, no. 40), Jossey-Bass, San Francisco, pp. 107-136.

Flavell, J. H., Flavell, E. R., and Green, F. L. (1983). Development of the appearance-reality distinction. *Cognitive Psychol.* 15: 96-120.

Fogel, A. (1982). Affect dynamics in early infancy: Affective tolerance. In Field, T., and Fogel, A. (eds.), *Emotion and Early Interaction,* Erlbaum, Hillsdale, New Jersey, pp. 25-56.

Fox, N. A. (1989a). Psychophysiological correlates of emotional reactivity during the first year of life. *Dev. Psychol.* 25: 364-372.

Fox, N. A. (1989b). Heart rate variability and self-regulation: Individual differences in autonomic patterning and their relation to infant and child temperament. In Reznick, S., and Kagan, J. (eds.), *Perspectives on Behavioral Inhibition,* University of Chicago Press, Chicago, pp. 177-195.

Fox, N. A., and Davidson, R. J. (1984). Hemispheric substrates of affect: A developmental model. In Fox, N. A., and Davidson, R. J. (eds.), *The Psychobiology of Affective Development,* Erlbaum, Hillsdale, New Jersey, pp. 353-381.

Fox, N. A., and Davidson, R. J. (1987). Electroencephalogram asymmetry in response to the approach of a stranger and maternal separation in 10-month-old infants. *Dev. Psychol.* 23: 233-240.

Fox, N. A., and Davidson, R. J. (1988). Patterns of brain electrical activity during facial signs of emotion in 10-month-old infants. *Dev. Psychol.* 24: 230-236.

Fox, N. A., and Davidson, R. J. (1991). Hemispheric specialization and separation protest behavior: Developmental processes and individual differences. In Gewirtz, J. L., and Kurtines, W. (eds.), *Intersection Points in Attachment Research,* Plenum, New York, pp. 147-164.

Frederickson, B. L., and Carstensen, L. L. (1990). Choosing social partners: How old age and anticipated endings make people more selective. *Psychol. Aging* 5: 335-347.

Frodi, A. M., and Lamb, M. E. (1980). Child abusers' responses to infant smiles and cries. *Child Dev.* 51: 238-241.

Fuchs, D., and Thelen, M. H. (1988). Children's expected interpersonal consequences of communicating their affective state and reported likelihood of expression. *Child Dev.* 59: 1314-1322.

Gaensbauer, T. J. (1982). Regulation of emotional expression in infants from two contrasting caretaking environments. *J. Am. Acad. Child Psychiat.* 21: 163-171.

Gaensbauer, T. J., and Mrazek, D. (1981). Differences in the patterning of affective expression in infants. *J. Am. Acad. Child Psychiat.* 20: 673-691.

Gaensbauer, T. J., and Sands, K. (1979). Distorted affective communications in abused/neglected infants and their potential impact on caretakers. *J. Am. Acad. Child Psychiat.* 18: 236-250.

Gekoski, M. J., Rovee-Collier, C. K., and Carulli-Rabinowitz, V. (1983). A longitudinal analysis of inhibition of infant distress: The origins of social expectations? *Infant Behav Dev.* 6: 339-351.

Gianino, A., and Tronick, E. (1988). The Mutual Regulation Model: The infant's self and interactive regulation and coping and defensive capacities. In Field, T., McCabe, P., and Schneiderman, N. (eds.) *Stress and Coping* (Vol. 2), Erlbaum, Hillsdale, New Jersey, pp. 47-68.

Gnepp, J., and Chilamkurti, C. (1988). Children's use of personality attributions to predict other people's emotional and behavioral reactions. *Child Dev.* 59: 743-754.

Gnepp, J., and Gould, M. E. (1985). The development of personalized inferences: Understanding other people's emotional reactions in light of their prior experiences. *Child Dev.* 56: 1455-1464.

Goldsmith, H. H., Buss, A. H., Plomin, R., Rothbart, M. K., Thomas, A., Chess, S., Hinde, R. A., and McCall, R. B. (1987). Roundtable: What is temperament? Four approaches. *Child Dev.* 58: 505-529.

Gordon, S. L. (1989). The socialization of children's emotions: Emotional culture, competence, and exposure. In Saarni, C., and Harris, P. (eds.), *Children's Understanding of Emotion,* Cambridge University Press, Cambridge, pp. 319-349.

Gottman, J., and Mettetal, G. (1986). Speculations about social and affective development: Friendship and acquaintanceship through adolescence. In Gottman, J. M., and Parker, J.G. (eds.), *Conversations of Friends: Speculations on Affective Development,* Cambridge University Press, Cambridge, pp. 192-237.

Graham, S. (1991). A review of attribution theory in achievement contexts. *Educat. Psychol. Rev.* 3: 5-39.

Graham, S., and Weiner, B. (1986). From an attributional theory of emotion to developmental psychology: A round-trip ticket? *Soc. Cognit.* 4: 152-179.

Gross, D., and Harris, P. L. (1988). False beliefs about emotion: Children's understanding of misleading emotional displays. *Int. J. Behav. Dev.* 11: 475-488.

Gunnar, M. R. (1986). Human developmental psychoneuroendocrinology: A review of research on neuroendocrine responses to challenge and threat in infancy and childhood. In Lamb, M., Brown, A., and Rogoff, B. (eds.), *Advances in Developmental Psychology* (Vol. 4), Erlbaum, Hillsdale, New Jersey, pp. 51-103.

Gunnar, M. R., Mangelsdorf, S., Larson, M., and Hertzgaard, L. (1989). Attachment, temperament and adrenocortical activity in infancy: A study of psychoendocrine regulation. *Dev. Psychol.* 25: 355-363.

Gunnar, M. R., Marvinney, D., Isensee, J., and Fisch, R. O. (1989). Coping with uncertainty: New models of the relations between hormonal, behavioral and cognitive processes. In Palermo, D. (ed.), *Coping with Uncertainty,* Erlbaum, Hillsdale, New Jersey, pp. 101-129.

Gunnar, M. R., Mangelsdorf, S., Kestenbaum, R., Lang, S., Larson, M., and Andreas, D. (1991). Temperament, attachment, and neuroendocrine reactivity: A systemic approach to the study of stress in normal infants. In Cicchetti, D., (ed.), *The Emergence of a Discipline: Rochester Symposium on Developmental Psychopathology,* Cambridge University Press, Cambridge, pp. 119-138.

Harris, P. L. (1983). Children's understanding of the link between situation and emotion. *J. Exp. Child Psychol.* 36: 490-509.

Harris, P. L., and Gross, D. (1989). Children's understanding of real and apparent emotion. In Astington, J. W., Harris, P. L., and Olson, D. R. (eds.), *Developing Theories of Mind,* Cambridge University Press, New York, pp. 295-314.

Harris, P. L., and Lipian, M. S. (1989). Understanding emotion and experiencing emotion. In Saarni, C., and Harris, P. L. (eds.), *Children's Understanding of Emotion,* Cambridge University Press, Cambridge, pp. 241-258.

Harris, P. L., and Olthof, T. (1982). The child's concept of emotion. In Butterworth, G., and Light, P. (eds.), *Social Cognition: Studies in the Development of Understanding,* University of Chicago Press, Chicago, pp. 188-209.

Harris, P. L., Olthof, T., and Meerum Terwogt, M. (1981). Children's knowledge of emotion. *J. Child Psychol. Psychiat.* 22: 247-261.

Harris, P. L., Guz, G. R., Lipian, M. S., and Man-Shu, Z. (1985). Insight into the time course of emotion among Western and Chinese children. *Child Dev.* 56: 972-988.

Harris, P. L., Donnelly, K., Guz, G. R., and Pitt-Watson, R. (1986). Children's understanding of the distinction between real and apparent emotion. *Child Dev.* 57: 895-909.

Harris, P. L., Olthof, T., Meerum Terwogt, M., and Hardman, C. E. (1987). Children's knowledge of the situations that provoke emotion. *Int. J. Behav. Dev.* 10: 319-343.

Harter, S. (1982a). A cognitive-developmental approach to children's understanding of affect and trait labels. In Serafica, F.C. (ed.), *Social-Cognitive Development in Context,* Guilford, New York, pp. 27-61.

Harter, S. (1982b). Children's understanding of multiple emotions: A cognitive-developmental approach. In Overton, W. F. (ed.), *The Relationship Between Social and Cognitive Development,* Erlbaum, Hillsdale, New Jersey, pp. 147-194.

Harter, S. (1982c). The perceived competence scale for children. *Child Dev.* 53: 87-97.

Harter, S., and Buddin, B. J. (1987). Children's understanding of the simultaneity of two emotions: A five-stage developmental acquisition sequence. *Dev. Psychol.* 23: 388-399.

Harter, S., and Pike, R. (1984). The pictorial scale of perceived competence and social acceptance for young children. *Child Dev.* 55: 1969-1982.

Haviland, J. M., and Lelwica, M. (1987). The induced affect response: 10-week-old infants' responses to three emotion expressions. *Dev. Psychol.* 23: 97-104.

Healey, B. T., Fox, N. A., and Porges, S. W. (1988). *The Heritability of Autonomic Patterns and Social Behavior in Young Twins,* Manuscript submitted for publication, University of Miami Medical School.

Hetherington, E. M., Cox, M., and Cox, R. (1982). Effects of divorce on parents and children. In Lamb, M. (ed.), *Nontraditional Families,* Erlbaum, Hillsdale, New Jersey, pp. 233-288.

Hoffman, M. L. (1982). Development of prosocial motivation: Empathy and guilt. In Eisenberg, N. (ed.), *The Development of Prosocial Behavior,* Academic, New York, pp. 281-313.

Izard, C. E., and Malatesta, C. Z. (1987). Perspectives on emotional development I: Differential emotions theory of early emotional development. In Osofsky, J. D. (ed.), *Handbook of Infant Development,* (2nd Ed), Wiley, New York, pp. 494-554.

Jersild, A. T. (1954). Emotional development. In Carmichael, L. (ed.), *Manual of Child Psychology* (2nd Ed.), Wiley, New York, pp. 833-917.

Kagan, J., Reznick, J. S., and Snidman, N. (1987). The physiology and psychology of behavioral inhibition in children. *Child Dev.* 58: 1459-1473.

Kagan, J., Reznick, J. S., and Gibbons, J. (1989). Inhibited and uninhibited types of children. *Child Dev.* 60: 838-845.

Karraker, K. H., and Lake, M. A. (1991). Normative stress and coping processes in infancy. In Cummings, E. M., Greene, A. L., and Karraker, K. H. (eds.), *Life-Span Developmental Psychology: Life-Span Perspectives on Stress and Coping,* Erlbaum, Hillsdale, New Jersey, pp. 85-108.

Kessen, W., and Mandler, G. (1961). Anxiety, pain, and the inhibition of distress. *Psychol. Rev.* 68: 396-404.

Kinsbourne, M., and Bemporad, B. (1984). Lateralization of emotion: A model and the evidence. In Fox, N. A., and Davidson, R. J. (eds.), *The Psychobiology of Affective Development,* Erlbaum, Hillsdale, New Jersey, pp. 259-291.

Kinsbourne, M., and Hiscock, M. (1983). The normal and deviant development of functional lateralization of the brain. In Mussen, P. H. (ed.); Haith, M. M., and Campos, J. J. (Vol. eds.), *Handbook of Child Psychology* (Vol. II): *Infancy and Developmental Psychobiology* (4th Ed.), Wiley, New York, pp. 157-280.

Klinnert, M. D., Campos, J. J., Sorce, J. F., Emde, R. N., and Svejda, M. (1983). Emotions as behavior regulators: Social referencing in infancy. In Plutchik, R., and Kellerman, H. (eds.), *Emotion: Theory, Research, and Experience* (Vol. 2): *Emotions in Early Development,* Academic, New York, pp. 57-86.

Korner, A. F., and Thoman, E. B. (1970). Visual alertness in neonates as evoked by maternal care. *J. Exp. Child Psychol.* 10: 67-78.

Korner, A. F., and Thoman, E. B. (1972). The relative efficacy of contact and vestibular-proprioceptive stimulation in soothing neonates. *Child Dev.* 43: 443-453.

Kropp, J. P., and Haynes, O. M. (1987). Abusive and nonabusive mothers, ability to identify general and specific emotion signals of infants. *Child Dev.* 58: 187-190.

Labouvie-Vief, G., Hakim-Larson, J., DeVoe, M., and Schoeberlein, S. (1989). Emotions and self-regulation: A life span view. *Human Dev.* 32: 279-299.

Lamb, M. E. (1981a). Developing trust and perceived effectance in infancy. In Lipsitt, L.P. (ed.), *Advances in Infancy Research* (Vol. 2), Ablex, Norwood, New Jersey, pp. 101-127.

Lamb, M. E. (1981b). The development of social expectations in the first year of life. In Lamb, M. E., and Sherrod, L. (eds.), *Infant Social Cognition,* Erlbaum, Hillsdale, New Jersey, pp. 155-175.

Lamb, M. E., and Malkin, C. M. (1986). The development of social expectations in distress-relief sequences: A longitudinal study. *Int. J. Behav. Dev.* 9: 235-249.

Lamb, M. E., Thompson, R. A., Gardner, W. P., and Charnov, E. L. (1985). *Infant-Mother Attachment,* Erlbaum, Hillsdale, New Jersey.

Lerner, J. V., and Lerner, R. M. (1983). Temperament and adaptation across life: Theoretical and empirical issues. In Baltes, P. B., and Brim, O. G., Jr. (eds.), Life-Span Development and Behavior (Vol. 5), Academic, New York, pp. 197-231.

Lepper, M. R. (1988). Motivational considerations in the study of instruction. *Cognit. Instr.* 5: 289-309.

Levenson, R. W. (1988). Emotion and the autonomic nervous system: A prospectus for research on autonomic specificity. In Wagner, H. L. (ed.), *Social Psychophysiology and Emotion: Theory and Clinical Applications,* Wiley, London, pp. 17-42.

Lewis, M., and Michalson, L. (1983). *Children's Emotions and Moods: Developmental Theory and Measurement,* Plenum, New York.

Lewis, M., and Schaeffer, S. (1981). Peer behavior and mother-infant interaction in maltreated children. In Lewis, M., and Rosenblum, L. (eds.), *The Uncommon Child,* Plenum, New York, pp. 193-223.

Lipsitt, L. (1983). Stress in infancy: Toward understanding the origins of coping behavior. In Garmezy, N., and Rutter, M. (eds.), *Stress, Coping, and Development in Children,* McGraw-Hill, New York, pp. 161-190.

Malatesta, C. Z. (1981). Affective development over the lifespan: Involution or growth? *Merrill-Palmer Q.* 27: 145-173.

Malatesta, C. Z. (1990). The role of emotions in the development and organization of personality. In Thompson, R. A. (ed.), *Socioemotional Development. Nebraska Symposium on Motivation* (Vol. 36), University of Nebraska Press, Lincoln, New Jersey, pp. 1-56.

Malatesta, C. Z., and Haviland, J. M. (1982). Learning display rules: The socialization of emotion expression in infancy. *Child Dev.* 53: 991-1003.

Malatesta, C. Z., and Izard, C. E. (1984). The ontogenesis of human social signals: From biological imperative to symbol utilization. In Fox, N. A., and Davidson, R. J. (eds.), *The Psychobiology of Affective Development,* Erlbaum, Hillsdale, New Jersey, pp. 161-206.

Malatesta, C. Z., Grigoryev, P., Lamb, C., Albin, M., and Culver, C. (1986). Emotion socialization and expressive development in preterm and full-term infants. *Child Dev.* 57: 316-330.

Malatesta, C. Z., Culver, C., Tesman, J. R., and Shepard, B. (1989). The development of emotion expression during the first two years of life. *Monogr. Soc. Res. Child Dev.* 54 (1-2, Serial no. 219).

Markus, H. (1977). Self-schemata and processing information about the self. *J. Person. Soc. Psychol.* 35: 63-78.

Masters, J. C., and Carlson, C. R. (1984). Children's and adults' understanding of the causes and consequences of emotional states. In Izard, C. E., Kagan, J., and Zajonc, R. B. (eds.), *Emotions, Cognition, and Behavior,* Cambridge University Press, Cambridge, pp. 438-463.

Masters, J. C., Ford, M. E., and Arend, R. A. (1983). Children's strategies for controlling affective responses to aversive social experience. *Motiv. Emotion* 7: 103-116.

McCoy, C. L., and Masters, J. C. (1985). The development of children's strategies for the social control of emotion. *Child Dev.* 56: 1214-1222.

Meerum Terwogt, M., and Olthof, T. (1989). Awareness and self-regulation of emotion in young children. In Saarni, C., and Harris, P. L. (eds.), *Children's Understanding of Emotion,* Cambridge University Press, Cambridge, pp. 209-237.

Meerum Terwogt, M., Koops, W., Oosterhoff, T., and Olthof, T. (1986). Development in processing of multiple emotional situations. *J. Gen. Psychol.* 113: 109-119.

Meerum Terwogt, M., Schene, J., and Harris, P. L. (1986). Self-control of emotional reactions by young children. *J. Child Psychol. Psychiat.* 27: 357-366.

Miller, P. J., and Moore, B. B. (1989). Narrative conjunctions of caregiver and child: A comparative perspective on socialization through stories. *Ethos* 17: 428-449.

Miller, P. J., and Sperry, L. L. (1987). The socialization of anger and aggression. *Merrill-Palmer Q.* 33: 1-31.

Miller, P. J., and Sperry, L. L. (1988). The socialization and acquisition of emotional meanings, with special reference to language: A reply to Saarni. *Merrill-Palmer Q.* 34: 217-222.

Miller, S. M., and Green, M. L. (1985). Coping with stress and frustration: Origins, nature, and development. In Lewis, M., and Saarni, C. (eds.), *The Socialization of Emotions,* Plenum, New York, pp. 263-314.

Mischel, H. N., and Mischel, W. (1983). The development of children's knowledge of self-control strategies. *Child Dev.* 54: 603-619.

Mischel, W., and Mischel, H. N. (1977). Self-control and the self. In Mischel, T., (ed.), *The Self: Psychological and Philosophical Issues,* Basil Blackwell, Oxford, pp. 31-64.

Miyake, K., Chen, S.-J., and Campos, J. J. (1985). Infant temperament, mother's mode of interaction, and attachment in Japan: An interim report. In Bretherton, I., and Waters, E. (eds.), Growing points in attachment theory and research. *Monogr. Soc. Res. Child Dev.* 50 (1-2, Serial no. 209).

Miyake, K., Campos, J. J., Kagan, J., and Bradshaw, D. L. (1986). Issues in socioemotional development. In Stevenson, H., Azuma, H., and Hakuta, K. (eds.), *Child Development and Education in Japan,* Freeman, New York, pp. 239-281.

Mood, D. W., Johnson, J. E., and Shantz, C. U. (1978). Social comprehension and affect-matching in young children. *Merrill-Palmer Q.* 24: 63-66.

Panksepp, J. (1989). The neurobiology of emotions: Of animal brains and human feelings. In Wagner, H., and Manstead, T. (eds.), *Handbook of Psychophysiology,* Plenum, New York, pp. 5-26.

Porges, S. W. (1991). Vagal tone: An autonomic mediator of affect. In Garber, J., and Dodge, K. (eds.), *The Development of Emotion Regulation and Dysregulation,* Cambridge University Press, Cambridge, pp. 111-128.

Ridgeway, D., Waters, E., and Kuczaj, S. A. (1985). Acquisition of emotion-descriptive language: Receptive and productive vocabulary norms for ages 18 months to 6 years. *Dev. Psychol.* 21: 901-908.

Rothbart, M. K. (1981). Measurement of temperament in infancy. *Child Dev.* 52: 569-578.

Rothbart, M. K., and Derryberry, D. (1981). Development of individual differences in temperament. In Lamb, M. E., and Brown, A. L. (eds.), *Advances in Developmental Psychology* (Vol. 1), Erlbaum, Hillsdale, New Jersey, pp. 37-86.

Rothbart, M. K., and Posner, M. I. (1981). Temperament and the development of self-regulation. In Hartlage, L. C., and Telzrow, C. F. (eds.), *The Neuropsychology of Individual Differences: A Developmental Perspective,* Plenum, New York, pp. 93-123.

Rubin, K. H., and Rose-Krasnor, L. (1986). Social-cognitive and social behavioral perspectives on problem solving. In Perlmutter, M. (ed.), *Cognitive Perspectives on Children's Social and Behavioral Development. Minnesota Symposium on Child Psychology* (Vol. 18), Erlbaum, Hillsdale, New Jersey, pp. 1-68.

Rubin, K. H., and Rose-Krasnor, L. (in press). Interpersonal problem-solving and social competence in children. In van Hasselt, V. B., and Hersen, M. (eds.), *Handbook of Social Development: A Lifespan Perspective,* Plenum, New York.

Russell, J. A., and Ridgeway, D. (1983). Dimensions underlying children's emotion concepts. *Dev. Psychol.* 19: 795-804.

Rutter, M., and Garmezy, N. (1983). Developmental psychopathology. In Mussen, P. H. (ed.), Hetherington, E. M. (Vol. ed.), *Handbook of Child Psychology* (Vol. IV): *Socialization, Personality, and Social Development,* Wiley, New York, pp. 775-911.

Saarni, C. (1979). Children's understanding of display rules for expressive behavior. *Dev. Psychol.* 15: 424-429.

Saarni, C. (1984). An observational study of children's attempts to monitor their expressive behavior. *Child Dev.* 55: 1504-1513.

Saarni, C. (1989). Children's understanding of strategic control of emotional expression in social transactions. In Saarni, C., and Harris, P. L. (eds.), *Children's Understanding of Emotion,* Cambridge University Press, Cambridge, pp. 181-208.

Saarni, C. (1990). Emotional competence: How emotions and relationships become integrated. In Thompson, R. A. (ed.), *Socioemotional Development. Nebraska Symposium on Motivation* (Vol. 36), University of Nebraska Press, Lincoln, New Jersey, pp. 115-182.

Saarni, C., and Harris, P. L. (eds.) (1989). *Children's understanding of emotion.* Cambridge University Press, Cambridge.

Sagi, A., Lamb, M. E., Lewkowicz, K. S., Shoham, R., Dvir, R., and Estes, D. (1985). Security of infant-mother, -father, and -metapelet attachments among Kibbutz-reared Israeli children. In Bretherton, I., and Waters, E. (eds.), *Growing Points in Attachment Theory and Research. Monogr. Soc. Res. Child Dev.* 50 (1-2, Serial no. 209).

Schwartz, R. M., and Trabasso, T. (1984). Children's understanding of emotions. In Izard, C. E., Kagan, J., and Zajonc, R. (eds.), *Emotions, Cognition, and Behavior,* Cambridge University Press, New York, pp. 409-437.

Selman, R. L. (1981). *The Growth of Interpersonal Understanding,* Academic, New York.

Selman, R. L. (1981). What children understand of intrapsychic processes: The child as a budding personality theorist. In Shapiro, E. K., and Weber, E. (eds.), *Cognitive and Affective Growth,* Erlbaum, Hillsdale, New Jersey, pp. 187-215.

Shantz, C. U. (1983). *Social Cognition.* In Mussen, P. H. (ed.), Flavell, J. H., and Markman, E. M. (Vol. eds.), *Handbook of Child Psychology* (Vol. III): *Cognitive Development,* Wiley, New York, pp. 495-555.

Shaver, P., Schwartz, J., Kirson, D., and O'Connor, C. (1987). Emotion knowledge: Further exploration of a prototype approach. *J. Person. Soc. Psychol.* 52: 1061-1086.

Smolek, L., and Weinraub, M. (March 1979). *Separation Distress and Representational Development.* Paper presented at the Biennial Meeting of the Society for Research in Child Development, San Francisco, California.

Sroufe, L. A., and Wunsch, J. P. (1972). The development of laughter in the first year of life. *Child Dev.* 43: 1326-1344.

Stein, N. L., and Levine, L. J. (1989). The causal organization of emotional knowledge: A developmental study. *Cognit. Emotion.* 3: 343-378.

Stein, N. L., and Trabasso, T. (1989). Children's understanding of changing emotional states. In Saarni, C., and Harris, P. L. (eds.), *Children's Understanding of Emotion,* Cambridge University Press, Cambridge, pp. 50-77.

Stern, D. N. (1974). The goal and structure of mother-infant play. *J. Am. Acad. Child Psychiat.* 13: 402-421.

Stern, D. N. (1977). *The First Relationship,* Harvard University Press, Cambridge, Massachusetts.

Stern, D. N. (1986). *The Interpersonal World of the Infant,* Basic, New York.

Stern, D. N., Hofer, L., Haft, W., and Dore, J. (1985). Affect attunement: The sharing of feeling states between mother and infant by means of intermodal fluency. In Field, T. M., and Fox, N. A. (eds.), *Social Perception in Infants,* Ablex, Norwood, New Jersey, pp. 249-268.

Stiefel, G. S., Plunkett, J. W., and Meisels, S. J. (1987). Affective expression among preterm infants of varying levels of biological risk. *Infant Behav. Dev.* 10: 151-164.

Stifter, C. A., and Fox, N. A. (1990). Infant reactivity: Physiological correlates of newborn and 5-month temperament. *Dev. Psychol.* 26: 582-588.

Stipek, D. (1983). A developmental analysis of pride and shame. *Human Dev.* 26: 42-54.

Taylor, D. A., and Harris, P. L. (1984). Knowledge of strategies for the expression of emotion among normal and maladjusted boys: A research note. *J. Child Psychol. Psychiat.* 24: 141-145.

Termine, N. T., and Izard, C. E. (1988). Infants' responses to their mothers' expressions of joy and sadness. *Dev. Psychol.* 24: 223-229.

Thompson, R. A. (1987). Development of children's inferences of the emotions of others. *Dev. Psychol.* 23: 124-131.

Thompson, R. A. (1989). Causal attributions and children's emotional understanding. In Saarni, C., and Harris, P. L. (eds.), *Children's Understanding of Emotion,* Cambridge University Press, Cambridge, pp. 117-150.

Thompson, R. A. (1990). Emotion and self-regulation. In Thompson, R. A. (ed.), *Socioemotional Development. Nebraska Symposium on Motivation* (Vol. 36), University of Nebraska Press, Lincoln, Nebraska, pp. 367-467.

Thompson, R. A., and Lamb, M. E. (1983). Individual differences in dimensions of socioemotional development in infancy. In Plutchik, R., and Kellerman, H. (eds.), *Emotion: Theory, Research, and Experience* (Vol. 2): *Emotions in Early Development,* Academic, New York, pp. 87-114.

Thompson, R. A., and Limber, S. (1990). "Social anxiety" in infancy: Stranger wariness and separation distress. In Leitenberg, H. (ed.), *Social Anxiety,* Plenum, New York, pp. 85-137.

Thompson, R. A., Cicchetti, D., Lamb, M. E., and Malkin, C. (1985). Emotional responses of Down Syndrome and normal infants in the Strange Situation: The organization of affective behavior in infants. *Dev. Psychol.* 21: 828-841.

Thompson, R. A., Connell, J. P., and Bridges, L. (1988). Temperament, emotion, and social interactive behavior in the Strange Situation: A component process analysis of attachment system functioning. *Child Dev.*, 59: 1102-1110.

Trabasso, T., Stein, N. L., and Johnson, L. R. (1981). Children's knowledge of events: A causal analysis of story structure. In Bower, G. (ed.), *The Psychology of Learning and Motivation,* Academic, New York, pp. 237-282.

Tronick, E. Z., Cohn, J., and Shea, E. (1986). The transfer of affect between mothers and infants. In Brazelton, T. B., and Yogman, M. W. (eds.), *Affective Development in Infancy,* Ablex, Norwood, New Jersey, pp. 11-25.

Tucker, D. M., and Frederick, S. L. (1989). Emotion and brain lateralization. In Wagner, H., and Manstead, T. (eds.), *Handbook of Psychophysiology: Emotion and Social Behavior,* Wiley, New York, pp. 22-70.

Watson, J. S. (1972). Smiling, cooing, and "the game." *Merrill-Palmer Q.* 18: 323-339.

Watson, J. S., and Ramey, C. T. (1972). Reactions to response-contingent stimulation in early infancy. Merrill-Palmer Q. 18: 219-227.

Weiner, B., and Graham, S. (1984). An attributional approach to emotional development. In Izard, C. E., Kagan, J., and Zajonc, R. (eds.), *Emotions, Cognition, and Behavior,* Cambridge University Press, New York, pp. 167-191.

Zahn-Waxler, C., and Kochanska, G. (1990). The origins of guilt. In Thompson, R. A. (ed.), *Socioemotional Development. Nebraska Symposium on Motivation* (Vol. 36), University of Nebraska Press, Lincoln, Nebraska, pp. 183-268.