



CHAPTER 11

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Key Themes in Emotional Development

- **Nature/Nurture** What roles do nature and nurture play in emotional development?
- **Sociocultural Influence** How does the socio-cultural context influence emotional development?
- **Child's Active Role** How does the child play an active role in the process of emotional development?
- **Continuity/Discontinuity** Is emotional development continuous or discontinuous?
- **Individual Differences** How prominent are individual differences in emotional development?
- **Interaction Among Domains** How does emotional development interact with development in other domains?

It's a quiet time on Sunday morning, just after a big breakfast, and Cindy admires her eight-month-old son Michael as he sits in his infant seat. He is looking at her so intently, raising his eyebrows a bit and scanning her face, gurgling contentedly. Suddenly the phone rings. Michael falls silent and opens his eyes wide. Cindy raises her eyebrows into two big arches and opens her mouth, making an exaggerated "Oohh" sound, suggesting surprise. Her baby eyes her with fascination, chortles, then smiles broadly. Cindy smiles back, chuckles, and says, "Must be Grandma calling to see how you are. Let me answer the phone, okay, honey?" She touches Michael affectionately under the chin as she gets up to reach for the phone. The baby lets out a shriek of delight and smiles again. Cindy can't help but laugh at the antics of her young son.

This scene, in all its simplicity, is a typical one in many families. Babies and caregivers revel in each other's company, and although the infant cannot yet speak, he participates fully in the interaction in nonverbal ways. The communication relies less on language than on both overt and subtle nuances in facial expressions and sounds that communicate emotional state. Some have characterized the back-and-forth nature of this exchange as a well-choreographed "waltz" wherein each partner looks to the other for cues about what to do next so the interaction proceeds smoothly and enjoyably. The episode also suggests some fundamental questions about the nature of human emotions and the forces that guide emotional development. Are our emotions innately determined, the result of a biological "prewiring"? Or are our displays and conceptions of emotions derived from learning the rules and conventions of our culture?

On the surface, the interaction between Cindy and her infant may suggest that nurture rather than nature is the determining factor, especially when the exchange is contrasted with interactions typical among the Gusii of Kenya. The Gusii culture places great emphasis on suppressing intense emotions, probably to maintain harmony in the small, tribal living units characteristic of that group. Consequently, mothers maintain a bland, neutral expression when interacting with their infants and try to inhibit strong shows of emotion from their children (Dixon et al., 1981). These differing cultural norms are reflected in the parenting styles of each culture and the behaviors children eventually display. At the same time, however, research with young infants suggests that emotions possess biological underpinnings as well.

In this chapter, we see how children's expression and understanding of emotions change with age. Many of these accomplishments are tied to advances in cognition that permit children to think about complex feeling states within themselves as well as in others. Part of the process of emotional growth also involves the child's ability to regulate his emotions—to cool down, for example, if he is feeling angry and frustrated. In addition, even though emotions are the personal expressions of the indi-

vidual's moods or feeling states, they also function as a mode of communicating with others. Given the social dimension of emotions, we will investigate the role they play in the child's relationships with others, specifically in the special "attachments" that emerge between child and caregivers. What is the psychological significance of these early emotional bonds, and how do they influence the child's later development?

What Are Emotions?

Emotions are a complex set of behaviors produced in response to some external or internal event, or elicitor, that serve to motivate and direct thoughts and actions. Emotions include several components. First, they have a *physiological* component, involving changes in autonomic nervous system activities such as respiration and heart rate. Fear or anxiety, for example, may be accompanied by more rapid breathing, increased heart rate and blood pressure, and perspiration. Second, emotions include an *expressive* component, usually a facial display that signals the emotion. Smiles, grimaces, cries, and laughter overtly express a person's emotional state. Third, emotions have an *experiential* component, the subjective feeling or cognitive judgment of having an emotion (Izard, Kagan, & Zajonc, 1984; Sroufe, 1996). Just how a person interprets and evaluates an emotional state depends on his level of cognitive development and the past experiences he has had. For a child to be able to state, "I feel happy," he must recognize the internal cues and external contexts associated with "happiness," which are derived from experience. In addition, he must have a relatively mature concept of the self as a feeling, responding being, a sign of cognitive maturity.

The Functions of Emotions

What role do emotions play in the psychological development of the child? On one level, they serve to organize and regulate the child's own behavior. If a child is learning to ride a two-wheeled bicycle and succeeds in tottering down the sidewalk without keeling over, she undoubtedly will feel elated and probably more motivated to practice this new skill for a few more minutes or even hours. If, on the other hand, she falls repeatedly or even injures herself, she may feel angry and discouraged and quit riding for a few days. Thus the child's emotional states regulate what she will decide to do (Campos et al., 1983).

A child's emotional state can also influence cognitive processes. One example concerns the relationship between emotion and learning. Research indicates that children who show an interest in certain objects or topics—a strong feeling of attraction or pleasure—pay more attention to those stimuli and remember them better in a subsequent memory test compared with objects that do not interest them (Renninger, 1992).

Of special importance is the fact that emotions serve to initiate, maintain, or terminate interactions with others. The baby's cry or smile almost invariably prompts contact with the caregiver. A toddler's frustration and anger over an unshared toy may lead him to abandon a playmate temporarily. In fact, a social dialogue completely devoid of emotional content is unusual. "Moods," more enduring emotional states, may help us understand the child's personality attributes, such as the tendency to be shy, dependent, or aggressive. These traits, in turn, can influence the frequency and form of the child's social contacts. Thus understanding emotional development can increase our appreciation of a broad range of children's accomplishments in other domains.

Measuring Emotions

Given the complex nature of emotions, measuring them becomes an important issue for researchers because all three dimensions—physiological, expressive, and cognitive—must be considered. One approach is to record changes in physiological

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Interaction Among Domains

emotions Complex behaviors involving physiological, expressive, and experiential components produced in response to some external or internal event.

functions such as heart rate (acceleration or deceleration), heart rate variability (the individual's basic heart rate pattern), or electroencephalogram (EEG) patterns showing brain activity as affective stimuli are presented (Fox, 1991; Fox & Davidson, 1986). Newer technologies, such as *positron emission tomography* (PET) and *functional magnetic resonance imaging* (fMRI) (see the chapter titled "Brain, Motor Skill, and Physical Development"), are also being used to track the activities of the brain as emotions are being experienced (Cacioppo & Gardner, 1999). Another strategy is to conduct fine-grained analyses of the child's facial expressions or vocalizations. Tiny movements of the muscles in the brow, eye, and mouth regions produce the facial configurations associated with joy, sadness, anger, and other emotions (Izard & Dougherty, 1982). Similarly, the frequency, loudness, duration, and sound patterns of the child's vocalizations indicate emotion (Papoušek, Papoušek, & Koester, 1986). Often facial expressions, body movements, and vocalizations function as an ensemble of emotion indicators; for example, a facial expression of anger, raising arms upward, and crying combine to signal "pick me up" (Weinberg & Tronick, 1994). Finally, the child's interpretations of her own and others' emotions can be assessed through the use of self-report measures (e.g., "Tell me how often you felt cheerful in the last week") and tasks requiring the child to label, match, or produce emotional expressions ("Tell me how the person in this picture feels" or "Show me the person who feels sad").

Although each methodological approach has helped to illuminate aspects of the child's emotional life, researchers must be cautious when interpreting their data. When physiological changes such as decelerated heart rate occur as the infant watches a lively segment of "Sesame Street," is he experiencing interest or surprise? The emotion that corresponds to a specific reaction of the nervous system is not always clear. Likewise, an overt emotional expression such as crying might represent a number of possible internal emotional states, such as sadness, joy, or fear. Self-reports of the child's emotional states present their own difficulties. As we saw in the chapter titled "Studying Child Development," some children may answer researchers' questions based on the way they think they should reply rather than on how they really feel. Others may be reluctant to discuss their inner feelings at all. Despite these methodological difficulties, researchers have learned a good deal about emotional development in the last two decades.

EXAMINING RESEARCH METHODS

Using Structured Observations to Record Infants' Facial Expressions


Many studies of children's emotions rely on observations of children's facial expressions during positive or stressful events to obtain clues about their affective experiences. For example, in a recent study, Katherine Weinberg and her colleagues (Weinberg et al., 1999) observed six-month-old infants while they experienced two minutes of face-to-face interactions with their mothers and then a two-minute episode called the "still face." In the latter condition, mothers were instructed to look at the infant but not to make any facial expressions, talk, or touch their infant. The researchers were interested in whether boys and girls would react differently in these two situations. A detailed coding scheme called the AFFEX (formally called the System for Identifying Affect Expression by Holistic Judgment), developed by Carroll Izard and his associates (Izard & Dougherty, 1982), was one of the measures used to conduct the observations. A closer look at the AFFEX provides a good way of understanding some of the methodological issues associated with observational studies, including the concepts of reliability and validity mentioned in the chapter titled "Studying Child Development."

The AFFEX was developed to score ten facial expressions, including joy, interest, sadness, anger, and disgust. Each emotional expression is associated with discrete facial movements that are carefully described in the coding scheme. For example,

Figure 11.1 shows several components of the expression for anger, including brows lowered and drawn together, eyes narrowed or squinted, and the mouth squarish or angular. When all three components are present, the appearance of anger is said to be observed. Similarly, combinations of facial movements for other emotions are detailed in the coding scheme. Before they actually score data collected for a study, coders proceed through a rigorous training procedure that typically takes several hours. Observers are expected to agree with the master codes on a training tape at least 80 percent of the time; only then are they ready to begin scoring the data.

In the Weinberg et al. (1999) study, each second of videotape of the child's behaviors was coded by two observers. The percent of time the observers agreed in their judgments was between 82 and 95 percent for the emotions that were used in the study: joy, interest, sadness, and anger. Thus interrater *reliability*, the consistency of scores between two observers, was high.

Izard and Dougherty (1982) maintain that this scoring scheme also has good *construct validity*, that it measures what it is supposed to—in this case, particular emotions such as anger and joy. When the AFFEX was initially developed, groups of untrained adults were asked to make global judgments of the emotions expressed in twenty-five video segments of infants' faces. They agreed a substantial proportion of the time with a different group of raters who used the AFFEX to code these same tapes. Are there other methods that might be used to establish the validity of a coding scheme such as the AFFEX, perhaps even more convincingly? How can we come closer to knowing which emotions infants are experiencing internally as they are showing a particular facial expression?

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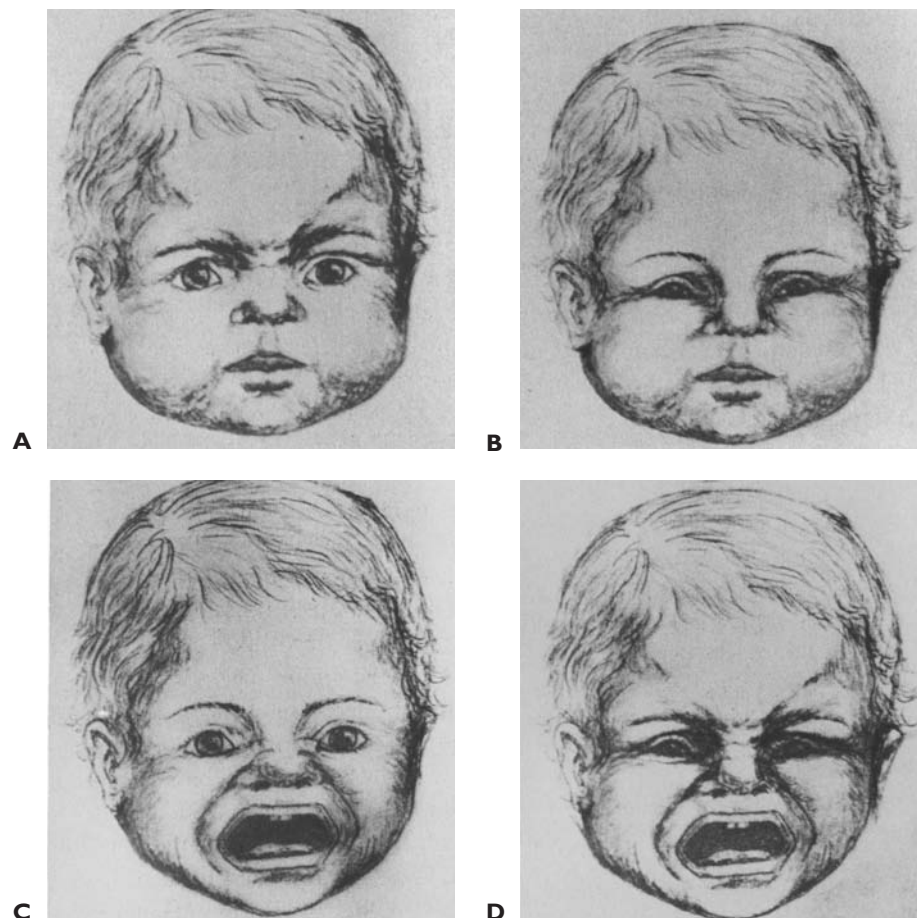


FIGURE 11.1

Identifying Facial Expressions of Anger in Infants

This series of drawings shows the elements of anger that are part of the AFFEX system for scoring facial expressions. Panel A shows the brows lowered and drawn together. Panel B shows the eyes narrowed. Panel C shows the angular or square-shaped mouth. When all of these elements appear together (as in Panel D), the emotion expressed is scored as anger.

Source: Izard & Dougherty, 1982.

As you will recall from the chapter titled “Studying Child Development,” it is important for observers in studies such as these to be as objective as possible, that is, to avoid *observer bias*. Ideally they should be unaware of the conditions in which children are participating. Weinberg and colleagues (1999) faced a special challenge in this regard—how could they keep observers from knowing which infants were boys and which were girls? It was important to keep any stereotypes or expectations that observers had about the emotional expressions of males and females from biasing their judgments. Yet mothers often call their infants by name and dress them according to their sex. The researchers handled this problem by keeping the specific hypotheses and details of the study from both mothers and coders. They were told simply that the project involved “infant interactive and communicative behavior with mothers.” Was this a satisfactory approach to this methodological problem? Is there an alternative way of handling this issue?

The results of the study indicated that for all infants the still face is a more stressful situation than normal face-to-face encounters, a finding that is explored further later in this chapter. In addition, boys expressed more anger than girls during both face-to-face and still-face situations. However, they also expressed more joy than girls, whereas girls expressed more interest. As this study shows, studying emotional expressions in infants requires painstaking attention to detail, a considerable investment of time in training reliable observers, and methodological challenges to establishing validity and objectivity.

Theoretical Perspectives on Emotional Development

Are human emotions biologically based, preprogrammed responses to specific environmental stimuli, or are they the products of the myriad learning experiences that accumulate over the course of infancy and childhood? Do emotions function in neat, discrete packages—anger being separate from sadness and fear? Or are different emotions simply points on a continuum of positive or negative arousal? These are some of the questions addressed by contemporary perspectives on emotion.

KEY THEME

Nature/Nurture

- **Biologically Based Explanations** The main champions of a strong biological view of emotions are Paul Ekman and Carroll Izard. After studying people in various cultures, Ekman (1972, 1973) concluded that there are universal facial expressions for certain basic emotions that are interpreted in similar ways across cultures. Ekman showed photographs of six faces, each depicting a particular emotion—happiness, sadness, anger, fear, surprise, or disgust—to participants in the United States, Japan, Chile, Brazil, and Argentina. As they looked at each photograph, participants were asked to identify the emotion displayed. Ekman (1972) found a high degree of accuracy across cultures as to which emotions were represented. A recent meta-analysis of ninety-seven studies confirms what Ekman first reported—that individuals from a wide variety of cultures correctly recognize fundamental emotions, showing the highest degree of accuracy for happiness (Elfenbein & Ambady, 2002).

Similarly, Izard believes that because certain emotional expressions are displayed by very young infants, they are necessarily innate and have distinct adaptive value (Izard, 1978; Izard & Malatesta, 1987). When the newborn infant tastes a bitter substance such as quinine, for example, she will pull up her upper lip, wrinkle her nose, and squint her eyes, indicating she has detected the unpleasant stimulus. No learning is necessary to produce this reaction of disgust. The caregiver observing this signal might respond by removing a potentially harmful substance from the baby’s mouth, thereby ensuring her well-being. The experience of emotion, Izard states, is the automatic product of the internal sensory feedback the individual receives from making the facial expression; wrinkling the face produces the feeling of disgust. Izard also maintains that once an emotion is activated, it in turn motivates the individual to



There are many cross-cultural similarities in the expression and interpretation of emotions. Most of us, for example, would recognize these Indian children's expressions as indicating happiness.

act. The experience of disgust, in other words, may lead the baby to spit out the distasteful substance. According to Izard and his colleagues, infants show a small set of discrete emotions, such as joy, anger, and fear, that function independently of one another. With development, these emotions become more interrelated and connected to cognition (Ackerman, Abe, & Izard, 1998). Furthermore, different patterns of expressing emotions eventually become organized as personality traits that can vary across individuals (Izard & Ackerman, 2000).

Both Ekman and Izard acknowledge that learning may play a role in emotional development, especially as children learn to control and regulate their emotions. They maintain, however, that the role of biological factors is paramount and that emotions originate in the genetic blueprints with which the child begins life.

● **A Cognitive-Socialization Explanation** Michael Lewis and Linda Michalson (1983) have provided an alternative account of the emotional life of the child, one that emphasizes the cognitive activities involved in emotional experiences. According to these theorists, an environmental event does not directly produce an emotional expression. Instead, the child relies on cognitive processes to assess the event, how it compares with past events, and the social rules surrounding the event. Suppose, for example, the child encounters a barking dog. Whether he cries with fear or smiles at the noisy animal depends on his past experiences with dogs (has he ever been bitten?) and on what parents and others have instructed him to believe about animals (“Barking dogs will bite—stay away!” or “Some dogs get excited when they want to play—it’s okay”). Cognitive processes thus act as *mediators*, or mental events that bridge the gap between environmental stimuli and the response the individual ultimately expresses. This conceptualization accounts for individual differences in emotional reactions when the same event produces different responses from two people.

According to Lewis and Michalson, socialization plays an important role in shaping the time and the manner in which emotions are displayed. Children in our culture learn that it is appropriate to feel happy at birthday parties and sad when a friend’s grandmother dies and that a smiling face and a sad face should be made under these respective circumstances. Socialization also guides the way emotions are managed. Young children in many cultures, for example, learn to inhibit expressions of fear and anger. Finally, socialization directs the way children label and interpret

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emotions. When the young child cries due to a physical injury and the parent says, “That hurts, doesn’t it?” the interpretation provides pain as the reason for the tears. When crying is the response to the collapse of a tower of toy blocks, the parent may provide a different interpretation for the child, such as “That’s frustrating.” These kinds of communications serve as an important vehicle by which children learn how to interpret their own emotional states.

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● **Emotion as Part of a Social Context** For some theorists, such as Joseph Campos and Carol Saarni (Campos et al., 1994; Saarni, 1999; Saarni, Mumme, & Campos, 1998), emotions are deeply and inextricably intertwined with the social environment. Children’s understanding of their own and others’ emotions and how they regulate their emotional states arise from the crossroads of personal goals and social interactions with others. What the child wants and desires, as well as the reactions of those in the social environment, create the “mix” for experiences of emotions. Emotions serve to motivate the individual toward particular social actions. For example, the emotion of “pride” can be the outcome of glowing comments from the parents after a child produces a colorful drawing. For that same child, the experience of pride will likely motivate her to share a newly written poem with a visiting grandmother. Emotions also arise when the emotions of others are observed (e.g., a mother shows great fear at the sound of thunder) and when one remembers emotional experiences from the past.

Rather than describing discrete emotions such as joy or fear, contextual theorists emphasize the positive or negative tone of emotions and their intensity. Emotions are not conceptualized as *entities* but instead are viewed as *processes* embedded in social interactions (Barrett, 1998). In other words, it is of paramount importance to understand how they work or function. According to this perspective, considerable attention is necessarily given to the process of socialization and to the role of culture. How do families help children to regulate their emotions, to control, for example, angry outbursts or overt expressions of fear? How do different cultures conceptualize emotions and what emotional styles do they emphasize, being expressive or more restrained, for example? These are the types of research questions that are motivated by this important perspective on emotional development.

FOR YOUR REVIEW

- What are the three components of emotions? How are these related to the ways in which researchers measure emotions?
- What functions do emotions serve in the various aspects of the child’s psychological life?
- What are the main ways in which biological, cognitive-socialization, and social-contextual theories of emotion differ from one another?

Expressing, Understanding, and Regulating Emotions

Researchers focus on emotional development from various angles. First, they examine whether children change in the way they express their own emotions. Do infants exhibit the full range of emotions that we see in adults, or does a developmental progression occur in the types of emotions children display? Second, do children change in their ability to understand emotions in themselves and others, to read facial expressions and interpret them, to know the circumstances that lead positive and negative emotions to arise, and to appreciate the consequences of different emotions? Finally, how do children change in the ways they regulate their emotions, and in particular in controlling their displays of negative emotions?

Early Emotional Development

Much of the groundwork for emotional development occurs during the first year or so of life. Parents and young infants frequently rely on nonverbal signals laden with emotional overtones to communicate with one another, as we saw with Cindy and Michael at the start of this chapter. Just what behaviors are infants capable of showing and “reading”?

- **Emotional Expression in Infancy** Even infants only a few days or weeks old are capable of producing the facial expressions associated with several emotions, including interest, distress, disgust, joy, sadness, anger, and surprise (Field et al., 1982; Izard, 1978; Izard et al., 1995). By seven months of age, the infant has added expressions of fear to his repertoire (Izard et al., 1980). The fact that these discrete facial expressions appear so early in infancy, before much learning can have taken place, provides strong support for the idea that emotional expressions are to some extent biologically determined. These emotions are often called **basic (or primary) emotions**.

Although even the earliest displays of basic emotions usually are recognized readily by adults, their form and the conditions that elicit them may change over the first few months. Two important emotional expressions in infancy, smiling and crying, demonstrate these changes. The smile is one of the most captivating and irresistible infant behaviors. In the newborn this behavior occurs primarily during the state of REM sleep, when dreaming is thought to occur, in bursts of several smiles in succession (Emde & Koenig, 1969). The mouth stretches sideways and up, producing a simple version of the smile. Although many hypotheses attempt to explain why very young infants produce this facial gesture (including the popular but mistaken notion that “gas” is responsible), the most consistent finding is that neonates smile when they experience a shift in physiological arousal state, such as when they fall asleep or become drowsy (Wolff, 1987). At approximately two weeks of age, the form of the smile changes. After the initial broadening of the lips, the corners of the lips retract even farther (with the mouth often opening), the cheek muscles contract, and the skin around the eyes wrinkles (Messinger, Fogel, & Dickson, 1999). Now the infant smiles during states of wakefulness, sometimes in response to familiar voices and sounds, sweet tastes, and pleasant food odors (Fogel, 1982; Steiner, 1979). By three months of age, smiles increase in frequency, and full-blown smiles—with open mouth and cheeks raised—become increasingly reserved for interactions in which the infant looks at a smiling mother (Messinger, Fogel, & Dickson, 2001). Because the “social smile” plays a substantial role in initiating and maintaining interactions between the infant and significant adults in her life, it is considered an important milestone in infant development. The shift from smiling as a reflexlike behavior to a controlled, voluntary response parallels the increasing maturation of the cerebral cortex, which is responsible for higher-order mental processes and deliberate, goal-directed behaviors.

Crying is another common way in which infants express emotion. Newborn babies cry for a variety of reasons, but primarily because they are hungry, cold, wet, in pain, or disturbed out of their sleep. The nature of the baby’s distress is often reflected in the type of cry she emits. In an extensive study of eighteen infants observed in their homes, Peter Wolff (1969) identified three patterns of crying. The first is the *basic (or hungry) cry*, a rhythmical sequence consisting of a vocalization, a pause, an intake of air, and another pause. The second is the *angry cry*, in which extra air is forced through the vocal cords during the vocalization segment of the basic cry. Finally, in the *pain cry*, the infant produces a long vocalization followed by an even longer silence as he holds his breath and then gasps.

Like smiling, crying is a response that promotes contact between the infant and the caregiver. Mothers usually react to their young infants’ cries promptly, especially an angry or a pain cry, and when they do, infants actually cry less in succeeding weeks and months (Bell & Ainsworth, 1972; Wolff, 1969). Usually the first order of

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basic emotion Emotion such as joy, sadness, or surprise that appears early in infancy and seems to have a biological foundation. Also called *primary emotion*.

business is to make sure the infant's physical needs are met. Other effective techniques for soothing the crying infant include providing a pacifier, swaddling with a blanket, and tapping some part of his body, that is, providing some form of rhythmic or continuous stimulation (Brackbill, 1975). Picking up the baby and holding her on one's shoulder also is soothing, probably because this act provides the infant with a broad range of stimulation that distracts her from crying (Korner, 1972).

By the time the infant is about two months of age, the causes of crying are no longer purely physiological. An infant might cry when the caregiver puts him down in his crib or when a favorite toy is removed from his grasp. At about this time, a new type of cry emerges: the *fussy* or *irregular cry*, which varies in intensity, is less rhythmic, and seems to function as a demand for particular objects or actions. At eight months of age, the infant will pause in crying to see if the mother or other adults are receiving the message (Bruner, 1983). As the infant gains more voluntary control over his vocalizations, crying patterns become even more varied and controlled and are displayed in a wider range of situations to signal an assortment of messages. Individual differences in the crying patterns of some infants are useful in diagnosing developmental abnormalities. Malnourished infants, for example, display more variability in the pitch of their cries, whereas children who have suffered oxygen deprivation produce shorter, higher-pitched cries (Michelsson, Sirvio, & Wasz-Hockert, 1977; Zeskind, 1981).

KEY THEME
Individual Differences

● **Recognizing Others' Emotions** Besides producing expressions themselves, infants are capable of discriminating and responding to emotional displays in others. Several remarkable studies conducted by Tiffany Field and her colleagues suggest that three-day-old infants are capable of imitating the facial expressions for happiness, surprise, and sadness when an adult models these expressions (Field et al., 1982, 1983). Infants widened their eyes and opened their mouths on "surprise" trials, drew back their lips on "happiness" trials, and tightened their mouths and furrowed their brows on "sadness" trials (see Figure 11.2). Although some researchers offer alternative explanations for these findings (see the chapter titled "Basic Learning and Perception"), many believe that infants have an early sensitivity to emotional expressions in others. In addition, researchers have shown that by three to four months of age, infants are able to distinguish among several expressions, particularly happiness as opposed to anger, surprise, and sadness (LaBarbera et al., 1976; Young-Browne, Rosenfeld, & Horowitz, 1977). They also tend to look less at sad faces and more at angry ones (Montague & Walker-Andrews, 2001).

Do infants derive meaning from the facial expressions they observe in others, or do they simply respond to changes in isolated facial features that contribute to these expressions (e.g., the upward curve of the mouth in the smile)? In the latter half of the first year, a phenomenon called **social referencing** suggests an infant's ability to interpret facial expressions. If infants are placed in an unfamiliar situation or encounter a strange object and are uncertain how to respond, they often will look to their caregivers for cues. The facial expression the caregiver displays typically will influence the infant's own emotional response and subsequent actions. For example, in one study, twelve-month-olds were placed on the shallow side of the visual cliff apparatus, which, as we saw in the chapter titled "Basic Learning and Perception," is used to assess the perception of depth. They were coaxed to move toward the place on the cliff where the surface appears to drop off. At this point, half of the participants' mothers posed a happy expression and the other half exhibited fear. Of the infants whose mothers smiled, 74 percent crossed the deep side of the cliff. In contrast, none of the infants whose mothers showed fear crossed the deep side. Moreover, these babies tended to produce fearful expressions on their own faces (Sorce et al., 1985). Thus infants not only "read" the expression they saw on their mothers' faces but also correctly interpreted its message.

Social referencing is a clear sign of the distinctly *interactive* nature of emotions. It is also a sign that infants begin to appreciate the referential nature of com-

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Child's Active Role

social referencing Looking to another individual for emotional cues in interpreting a strange or ambiguous event.



FIGURE 11.2
Infants' Imitation of
Facial Expressions

According to some research, three-day-old infants are capable of imitating expressions for happiness (top), sadness (middle), and surprise (bottom) when they are modeled by an adult. These emotions are categorized as *basic emotions*.

munication (see the chapter titled “Language”), as well as the intentions of others (see the chapter titled “Cognition: Piaget and Vygotsky”). When infants in one study heard an experimenter say “Iuu” in a strong negative tone while looking at a toy, they were less likely to approach it than if she said “Nice!” However, if the experimenter made any of these comments while out of view, infants did not make use of the emotional tones in her messages (Moses et al., 2001). They seem to appreciate that by expressing emotions—but specifically in a social context—individuals intend to communicate something about objects, people, or events. In that sense, social referencing is linked to advances in cognition. It is probably also an early sign of the child’s internalization of the views and values of parents, a process that will continue throughout the early years of childhood (Desrochers et al., 1994; Kochanska, 1994).

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● **Emotions as Regulators of Social Interactions** Given infants' ability to express and identify emotions in the context of interactions with others, developmental psychologists now recognize that emotions serve an important function in regulating and modulating early social exchanges. This dynamic process begins at about two or three months of age, when the infant looks into the adult's eyes and produces a "social smile" or a cry, to which the adult responds. The adult vocalization or facial expression, in turn, often precipitates another emotional response from the infant. Such episodes of reciprocal, mutually engaging cycles of caregiver-child behaviors are called **interactive synchrony**. During the child's first year, interactive synchrony characterizes about 30 percent of face-to-face interactions between infant and caregiver (Tronick & Cohn, 1989).

At about three months, primary caregivers typically assume the major responsibility for guiding interactions, producing repetitions of exaggerated faces and vocalizations to which the infant pays rapt attention (Stern, 1974). Infants, without doubt, notice and react to their mothers' expressive displays. When mothers do not return a smile but show a still face or a neutral pose, infants respond with a quizzical or sober look, avert their gaze, and touch themselves or some nearby object (Toda & Fogel, 1993; Tronick et al., 1978). When mothers show a positive expression, infants follow suit. If mothers look depressed, infants react by averting their gaze and sometimes crying (Cohn & Tronick, 1983). By about six to nine months of age, infants more clearly take the initiative; their displays of positive affect now more often precede their mothers' (Cohn & Tronick, 1987). Thus, throughout early infancy, the child becomes an increasingly active partner in an emotionally toned, interactive "duet" with the caregiver.

But what about the other 70 percent of the time, when infant-caregiver interactions are *asynchronous*, or uncoordinated with each other? Edward Tronick and his colleagues believe these episodes, which constitute the majority of infant-caregiver relations, also play an important part in normal emotional development. A common occurrence after a sequence in which infant and caregiver are not coordinated is the infant's attempt to repair the "interactive error." When the mother looks sad, for example, the infant's subsequent gaze aversion or crying encourages the mother to modify her own behavior, and frequently she does (Cohn & Tronick, 1983). Thus episodes of asynchrony give infants opportunities to learn about the rules of interaction and, in cases in which they are able to repair an interaction, give them a sense of mastery or control over their environment (Tronick & Cohn, 1989).

Affective exchanges between infant and caregiver lay the groundwork for social behavior and emotional dispositions at later ages. Researchers have observed that depressed mothers tend to be less positive in face-to-face interactions with their infants (Campbell, Cohn, & Meyers, 1995). Perhaps as a consequence, infants of clinically depressed mothers express a good deal of negative affect in face-to-face interactions (Cohn et al., 1986). They tend to express more sadness and anger, and their negative affect extends to other adults who are not depressed (Field, 1995; Field et al., 1988; Pickens & Field, 1993). These infants also show brain wave patterns similar to those of depressed adults (Dawson, 1994; Field et al., 1995). Thus the dominance of negative emotions during early mother-child interactions culminates in a general mood or background emotional state that apparently pervades the child's own behaviors (Tronick, Ricks, & Cohn, 1982). The child may bring this general affective tone to new situations; for example, an anxious child is likely to interpret a new event as frightening, whereas a happy child may react with curiosity. Finally, the nature of the affective exchanges between mother and child influences the strength of the emotional bond, or *attachment*, between them. Infants who attempt to elicit responses from their mothers by smiling, vocalizing, or crying at six months of age are more likely to have healthy attachments at age one year than children who withdraw from such interactions (Tronick et al., 1982); depressed mothers tend to have children with poorer quality attachments (Teti et al., 1995). As is discussed later in this chapter, healthy attachments, in turn, are correlated with many other positive developmental outcomes in social and cognitive functioning. Hence the tone of these early interactions is a crucial facet of child development.

KEY THEME**Child's Active Role**

interactive synchrony Reciprocal, mutually engaging cycles of caregiver-child behaviors.

Later Emotional Development

By their second year, many children begin to show emotions that reflect a more complex understanding of the self and social relationships. Shame, guilt, and envy, for example, each require the child to understand the perspective of another person—that the person may be disappointed with the child, may be hurt, or may feel affection for a third party. Such emotions also require a consciousness about the self and one's relations to others, a facet of development described in the chapter titled “Self and Values” (Campos et al., 1983; Lewis, 1989). Accordingly, emotions such as envy and guilt are known as **self-conscious emotions**.

The visible signs of self-conscious emotions can be multifaceted: a child displaying shame lowers her head and eyes, collapses her body, and often has an odd smile on her face (Lewis, Alessandri, & Sullivan, 1992). Asked to dance in front of people or told that he or she has failed a task, a preschooler might show embarrassment with a smiling face, a look away, and nervous body movements (Lewis & Ramsay, 2002). The expression of self-conscious emotions can change with age, too. At age two years, children show discernible signs of jealousy. The child may wedge himself between his mother and father as they are hugging or hit a sibling whom his parent just kissed (Cummings, Zahn-Waxler, & Radke-Yarrow, 1981). But as children get older, they are better able to manage their jealousy, especially in front of their parents (Miller, Volling, & McElwain, 2000). Basic emotions, such as fear, also undergo developmental changes, particularly in the types of stimuli that elicit them. Whereas early expressions of fear result from loud noises or strange people, later in childhood fear occurs as a response to more complex events, such as the possibility of failing in school or being rejected by peers (Morris & Kratchowill, 1983; Rutter & Garmezy, 1983). Thus, as the child's cognitive skills and social awareness grow, he expresses more complex emotions or more elaborate and controlled forms of the basic emotions.

- **Understanding Emotions** With the advent of language, children can communicate feelings by verbalizing instead of just frowning their brows and crying or making some other facial display. Children begin to use language to describe feeling

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By age three or four, children's understanding of emotions includes knowledge about how to soothe others' negative emotions. Preschoolers might suggest hugging or sharing a toy with a distressed child, for example.

self-conscious emotion

Emotion such as guilt and envy that appears later in childhood and requires knowledge about the self as related to others.

states between eighteen and thirty-six months of age, shortly after they begin to talk. Inge Bretherton and Marjorie Beeghly (1982) asked mothers of twenty-eight-month-olds to keep a diary of their children's verbalizations that referred to psychological states. Besides being able to apply a wide range of terms to express both positive and negative feelings, these children were able to discuss the conditions that led to a specific emotion and the actions that followed as a consequence. Several children, for example, made statements similar to "Grandma mad. I wrote on wall," suggesting an understanding of the reasons for another's emotion. Another type of utterance made by several children—"I cry. Lady pick me up and hold me"—signifies an understanding that emotions may be related to subsequent actions.

From age three to four years and older, children use more varied and complex emotion words (Fabes, Eisenberg, et al., 2001). At this age, children also become more proficient in verbally describing the causes and consequences of emotions (Barden et al., 1980). They tend to agree that certain events, such as receiving a compliment, lead to happy emotions, whereas others, such as being shoved, lead to negative feelings. Furthermore, they are able to suggest ways to ameliorate another's negative emotions, such as hugging a crying sibling or sharing toys to placate an angered playmate (Fabes et al., 1988).

Between about ages eight and ten, many children understand the emotional behaviors prescribed by cultural rules (e.g., you are supposed to look happy when you receive a gift even if you don't like it) or behaviors necessary to obtain certain goals (you should smile even if you don't feel well if you want your mother to allow you to go to a friend's party). In such cases, the individual masks or "fakes" an emotional state. Paul Harris and his associates (Harris et al., 1986) examined this skill in using emotional **display rules**, the cultural guidelines governing when and how to express emotions, by asking six- and ten-year-olds to listen to stories in which the central character felt either a positive or a negative emotion but had to hide it. After hearing the story, children were to describe verbally the facial expression of the protagonist, along with how this person really felt. Even six-year-olds could state that the emotion displayed would not match the emotion felt, although ten-year-olds provided a fuller explanation. These results suggest that by the middle school years, children have developed a broad understanding of the social norms and expectations that surround the display of feelings.

KEY THEME**Interaction Among Domains**

Knowledge about emotions can have significant ramifications for the child's social development. For example, five-year-old-children who are able to label correctly facial expressions of emotions are more likely to display positive social behaviors at age nine (Izard et al., 2001). Moreover, children who have substantial knowledge about the emotions that usually accompany given situations have higher scores on tests of moral development, are less likely to evidence behavior problems, and are better liked by their peers (Cook, Greenberg, & Kusche, 1994; Denham et al., 1990; Dunn, Brown, & Maguire, 1995). The reason may be that children who have greater knowledge about emotions are more likely to respond appropriately to the emotional expressions of their agemates.

Knowledge about emotions is probably gleaned, at least in part, from parents. Children who have greater knowledge about emotions—who can label emotional expressions on faces, describe the feelings of another person in an emotion-related situation, and talk about the causes of emotions—typically have mothers who discuss and explain emotions, often in the context of the child expressing a negative emotion himself. In other words, these mothers are good "coaches." On the other hand, when parents display more negative affect themselves or dismiss children's experiences of emotions (e.g., "You're overreacting!"), children's understanding of emotions is poorer and they are less socially competent (Denham et al., 1997; Dunn & Brown, 1994; Laible & Thompson, 2002). Parents who engage in such behaviors are probably missing opportunities to explain to their children the important elements of emotional responding. The extreme case is represented by children who are physically abused or neglected by their parents. These children have noticeable deficits in their

display rules The cultural guidelines governing when, how, and to what degree to display emotions.

ability to identify the emotional expressions that correspond to particular situations, such as going to the zoo and getting a balloon or losing a pet dog to disease. Physically abused children, perhaps not surprisingly, have a bias toward selecting angry expressions (Pollak et al., 2000).

Emotional development in older children is closely affiliated with advances in cognition that allow them to think in more complex, abstract terms. By the time they enter school, children begin to understand that changes in thoughts may lead to changes in feelings—that thinking happier thoughts, for example, might make a sad mood go away (Weiner & Handel, 1985). In addition, they comprehend the possibility of experiencing two contrasting emotions at the same time, such as feeling happy at receiving a gift but disappointed that it cannot yet be opened (Brown & Dunn, 1996). As children approach adolescence, their concepts of emotions center increasingly on internal psychological states. That is, whereas younger children identify their own emotional states based on the situations they are in (“I’m happy when it’s my birthday”), pre-adolescents and adolescents refer more frequently to their mental states (“I’m happy when I feel good inside”) (Harris, Olthof, & Meerum Terwoegt, 1981).

● **Regulating Emotions** In addition to becoming more adept at understanding various emotions, during the early and middle school years children generally become better able to regulate their own emotional states. Behaviors such as calming down after getting angry have important repercussions for the child’s social relationships and perhaps even mental health (Cicchetti, Ackerman, & Izard, 1995). In fact, much of the development of emotion that we have described previously—expressing, recognizing, and understanding emotions, as well as socialization experiences regarding emotions—culminates in the ability to regulate one’s affective state (Denham, 1998).

Emotion regulation actually has its earliest roots in infancy. In general, infants rely on caregivers to help them regulate their emotions with carrying, rocking, or soft vocalizations. Distraction also helps, at least in the short run (Harman, Rothbart, & Posner, 1997). Even young babies, however, make some attempts to regulate their own affective states, whether it be by sucking on a pacifier, by looking away if they become too aroused (as noted earlier in this chapter), or even by falling asleep (Kopp, 1989; Walden & Smith, 1997). Specific emotions may cause specific regulatory behaviors. For example, infants who experience fear when seeing an unpredictable mechanical toy withdraw from the stimulus or look at the mother. When frustrated and angered by the removal of an attractive toy, infants distract themselves or try to approach the toy (Buss & Goldsmith, 1998). Two-year-olds continue to use strategies such as distraction; when they are presented with a snack or a gift but must wait to obtain it, they typically shift their attention to other objects. Normally, this strategy alleviates their distress (Grolnick, Bridges, & Connell, 1996). But when young children focus on the source of their frustration, their anger tends to increase (Gilliom et al., 2002). By age three, many children show fewer tantrums and intense negative outbursts as they increasingly rely on language to communicate their intents and desires (Kopp, 1992). Physiological maturation probably contributes, too. Researchers suspect that early childhood is a time when the frontal portions of the brain, which control excitation and inhibition of emotion-linked behavior, are maturing (Fox, 1994; Schore, 1996).

One of the most important aspects of emotion regulation is what it predicts later in development. Infants who have difficulty regulating their emotions at six months of age, for example, are more likely to be noncompliant with their parents at age three (Stifter, Spinrad, & Braungart-Rieker, 1999). Similarly, preschoolers and elementary-age children who express a lot of anger, hostility, and other negative emotions show poorer social competence in school and are isolated from or rejected by peers (Eisenberg et al., 1997; Fabes et al., 2002; Hubbard, 2001). Perhaps of most concern, researchers have found that the inability to regulate negative emotions is part of the behavioral profile of children with conduct problems. In one study, preschool-age children, some of whom were identified as being at risk for behavior problems, were

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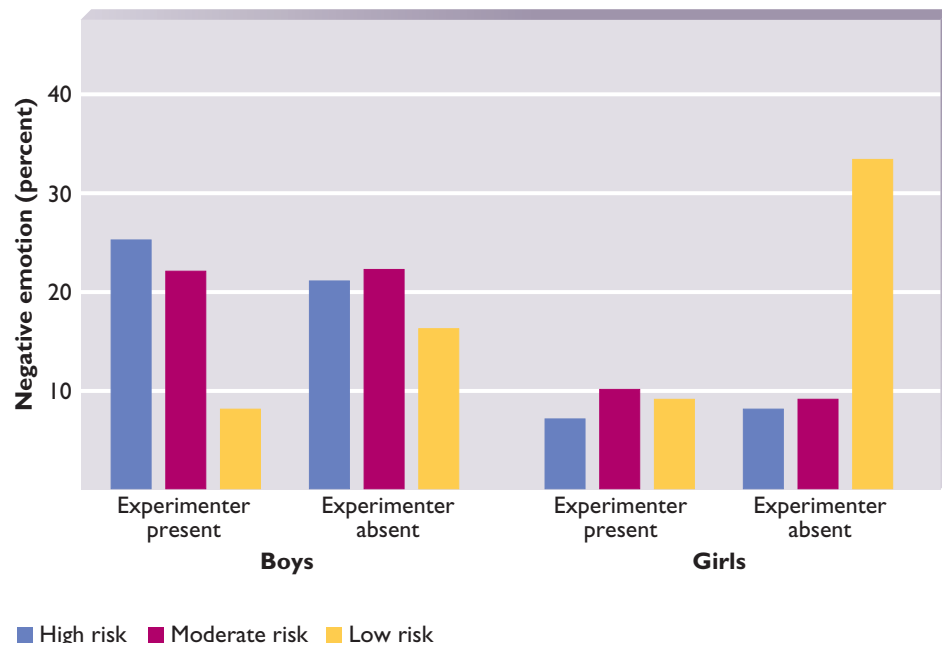
Interaction Among Domains

KEY THEME

Individual Differences

FIGURE 11.3
Emotion Regulation in
Children at Risk for
Conduct Problems

What happens when children who are at risk for behavior problems experience disappointment? In a study assessing this question, children who had been identified as being at high, medium, or low risk for conduct problems were given a prize that was disappointing to them. The graph shows that boys who were at risk showed a high percentage of negative emotions whether or not the experimenter was in the room with them. Low-risk boys were better able to regulate their negative feelings when someone was present in the room with them. Girls, in general, expressed fewer negative emotions regardless of whether or not they were with someone. The exception was low-risk girls, who expressed more negative emotions when alone.



Source: Cole, Zahn-Waxler, & Smith, 1994.

invited to a laboratory to participate in several cognitive tasks. After each child finished the session, he or she was offered a prize that was undesirable and disappointing. The children's emotional expressions were observed in both the presence and absence of the experimenter. As Figure 11.3 indicates, boys who were at risk for conduct problems expressed more anger, speaking rudely and with obvious negative emotion, compared with low-risk boys. High-risk boys also maintained that anger for longer periods of time while in the presence of the experimenter. Low-risk boys showed anger, too, but only when they were alone. The pattern for girls differed: girls from almost all risk categories expressed fewer negative emotions. These results suggest that boys who are reported by parents and teachers to have fewer behavior problems are better able to manage their emotions when in a social setting. Boys with conduct problems, on the other hand, seem to have difficulty regulating their anger, a fact that could be a source of their generally disruptive behavior (Cole et al., 1994). The evidence linking emotion regulation and later social development continues to mount, not only for children in the United States but also for those in other cultures, such as Indonesia (Eisenberg, Pidada, & Liew, 2001).

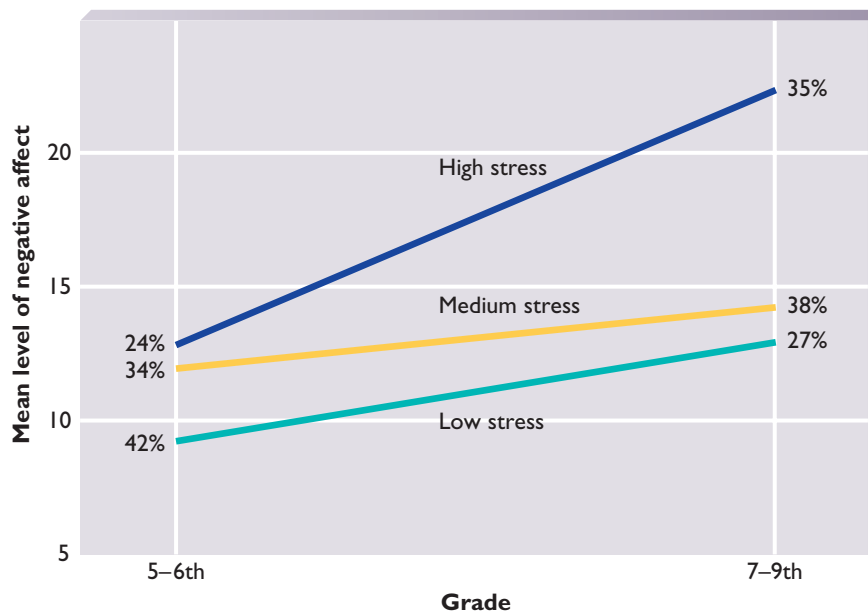
The way children learn to manage their emotions depends, at least in part, on the kinds of experiences their parents provide (e.g., do parents provide opportunities for children to become aroused or to calm down?), as well as what children learn are the consequences of their own emotional displays (e.g., what happened when I had an angry tantrum versus when I "used my words"?). When parents become distressed at their children's display of negative emotions and punish them, children later tend to express more anger and hostility and have more behavior problems and poorer social functioning in school (Eisenberg, Fabes, et al., 1999; Fabes, Leonard, et al., 2001). On the other hand, when parents provide supportive coaching and guidance for children's expression of emotion—by helping children talk about how they feel and suggesting ways of dealing with their emotions—children are better able to soothe themselves and moderate their negative emotions (Gottman, Katz, & Hooven, 1997). The general emotional tone of interactions with parents may play a role, too. Nancy Eisenberg and her colleagues found that mothers who were more positive in their emotional expressivity, in contrast to mothers who generally expressed negative emotions, had children who were better able to regulate their own emotions. The children of more negative mothers also behaved more aggressively and were rated as less socially competent by parents and teachers (Eisenberg, Gershoff, et al., 2001). Finally,

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Source: Larson & Ham, 1993.

FIGURE 11.4
Frequency of Negative Affect
Among Adolescents

To assess the types of emotions experienced by older children and adolescents, researchers “beeped” participants during their daily routines and asked them to report how they felt. The mean percentage of negative affect is shown along the vertical axis. The percentages indicated within the graph show the proportion of students in each grade reporting low, medium, or high stress associated with negative life events. Ninth-graders reported more negative affect than fifth-graders, and those who reported more stress in their lives were especially likely to experience negative emotions.

with development, children probably become more aware of their own emotional styles and seek out experiences that are compatible with their needs; some children may learn that sitting alone and playing is soothing, whereas others may seek the emotional release of a fast-paced basketball game (Thompson, 1994).

● **Emotions During Adolescence** By many popular accounts, adolescence is a unique phase in emotional development. Many laypeople, as well as professionals, believe adolescence is a time of “storm and stress,” of emotional turmoil and extreme moodiness. Does research substantiate this belief? Although the evidence is somewhat mixed, several studies suggest that adolescents do experience more negative emotions than children of other ages and, in fact, may be at risk for psychological problems such as depression (Larson & Lampman-Petratis, 1989; Petersen & Hamburg, 1986; Rutter, 1991).

In one study, for example, fifth- through ninth-graders wore electronic pagers for one week as they went through their normal daily routines. At random times over the week, the researchers “beeped” the participants to indicate they should rate their mood just before the signal. In addition, the children and their parents filled out questionnaires assessing the number of positive and negative life events they experienced in the past six months. Figure 11.4 shows the results. Ninth-graders reported more negative affect than fifth-graders; moreover, for these young adolescents, negative emotions were associated with a greater number of negative life events, such as changing schools, breaking up with a boyfriend or girlfriend, or getting along poorly with parents (Larson & Ham, 1993). By grade ten, though, adolescents’ emotional states become more stable and stop moving in a negative direction (Larson et al., 2002).

In addition, adolescents and their parents express increased negative emotions to each other from age twelve to about age fifteen, after which negativity declines. These parent-child interactions involve mutual reciprocal influences. Parents who receive a large amount of expressed negative affect from their adolescent children escalate in their own negative emotions over time, and, likewise, adolescents whose parents express negative emotions toward them increase in their negative affect (Kim et al., 2001). These results illustrate an important principle that we have introduced in this chapter and will discuss again in the chapter titled “The Family”: that parents and their children are often involved in a mutually influencing spiral of interactions, sometimes affecting each other in important and enduring ways.

ATYPICAL DEVELOPMENT

Adolescent Depression and Suicide

For some adolescents, negative emotional states become more extreme and manifest themselves as *depression*, a psychological disorder characterized by dejected mood for lengthy periods of time, eating and sleeping problems, low self-esteem, loss of energy, and other symptoms. According to recent estimates, roughly 35 percent of adolescents experience depressed mood and about 7 percent meet the criteria for clinical depression, with girls experiencing higher rates of depression than boys (Ge et al., 1994; Petersen et al., 1993; Wichstrøm, 1999).

The causes of depression in adolescents are complex and not completely understood by psychologists, but researchers have noticed that depressed children often have depressed parents. Studies of family relationships suggest that there is a genetic component to depression (Pike et al., 1996) but also that certain family climates are typical among children who are depressed. Parents who express less warmth and supportiveness and who participate in more conflicts with their children are more likely to have adolescents who are depressed (Ge, Best, et al., 1996; Greenberger & Chen, 1996; Messer & Gross, 1995). Children who witness or are victims of domestic violence are also at risk for depression (Downey et al., 1994; Sternberg et al., 1993). Perhaps these parents, whose poor parenting skills may be due to their own depression, weaken their children's ability to regulate their own emotions or influence their children to form negative ideas about social relationships (Cummings, 1995). The result is that the child, too, becomes depressed.

Why are adolescents especially vulnerable? Several explanations are possible. Cognitive growth may mean the adolescent thinks more about the self and the future. A switch from elementary to secondary school may mean adjustments in peer group relationships. Family relationships may be changing; parents may have reached a stage in their relationship at which they are considering divorce, for example (Petersen et al., 1993; Rutter, 1991). Changes in self-image may accompany the many biological changes in the body associated with puberty. For girls, depression is linked to issues of self-concept and interpersonal stress (Donnelly & Wilson, 1994; Rudolph & Hammen, 1999). Finally, some researchers believe that changes in hormone levels that occur during puberty may activate genes that put individuals at risk for psychological problems (Walker, 2002). Clearly, understanding and preventing depression in adolescents requires a consideration of several domains of development.

The most serious concern about adolescents who are depressed is their risk for committing suicide. Surveys suggest that 6 to 13 percent of adolescents have attempted suicide (Garland & Zigler, 1993). Between 1960 and 1990, the rate of adolescent suicide tripled (Bennett, 1994). Suicide is now the third leading cause of death among fifteen- to twenty-four-year-olds, and the fourth leading cause of death among children ages ten to fourteen (National Institute of Mental Health, 2002). Although the number of attempted suicides is greater in females than in males, completed suicides are more frequent among males than females. This difference is the consequence of the fact that males typically choose more lethal means of attempting suicide than females do. Homosexual male adolescents are at particular risk for suicide (Remafedi et al., 1998).


Some of the warning signs that a young person may be thinking about suicide include falling grades in school, drug or alcohol use, withdrawal from family or friends, or avoidance of social and sporting events. When these behaviors are combined with becoming especially quiet, changes in eating or sleeping patterns, giving away valued possessions, or talking or writing about suicide, the adolescent may be signaling a need for help. The Centers for Disease Control (1992) suggests that strategies to address the problem must include helping teachers and community leaders identify those most at risk, educating young people to become more knowledgeable about risk factors and intervention, developing screening, referral, and peer-support programs, support for crisis centers and hotlines, and reducing access to lethal means of suicide.

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 **SEE FOR YOURSELF**
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Preventing Suicide

FOR YOUR REVIEW

- What are the differences between basic and self-conscious emotions? Give some examples of basic emotions that researchers have observed in young infants. Give some examples of self-conscious emotions that emerge later in childhood.
- Why is the emergence of social referencing so significant in the course of emotional development?
- What are the dynamics of synchronous and asynchronous interactions between infant and caregiver? What is the significance of these types of interactions for later emotional development?
- What types of knowledge about emotions do children acquire in the years from preschool to adolescence?
- What strategies do children typically use to regulate their emotions?
- What is the significance of the child's ability to regulate his or her own emotions?
- How can parents and caregivers promote emotion knowledge and emotion regulation among children?
- What are the distinctive features of emotional development in adolescence?
- What factors are related to depression during adolescence?

Variations in Emotional Development

So far, our account of emotional development has emphasized commonalities across children in the expression and interpretation of emotions. Despite the generalities we have observed, however, there are noteworthy variations in emotional development among individuals and cultural groups.

Temperament

Emotions are not just transitory states of feeling and expression; often we discern a child's more enduring emotional mood and describe her personality as "cheerful" or "hostile," "easygoing" or "irritable." As we saw in the chapter titled "Genetics and Heredity," researchers have found that infants and children vary in *temperament*, a style of behavioral functioning that encompasses the intensity of expression of moods, distractibility, adaptability, and persistence. Individual differences among infants in these qualities often remain relatively stable over time and across different situations (Rothbart & Bates, 1998).

KEY THEME
Individual Differences

● **Patterns of Temperament** Stella Chess and Alexander Thomas (1982, 1990, 1991) have offered one conceptualization of temperament, identifying three basic patterns that many children display:

■ The *easy* child generally has positive moods, regular body functions, a low to moderate energy level in responses, and a positive approach to new situations. This child establishes regular feeding and sleeping schedules right from early infancy and adapts quickly to new routines, people, and places.

■ The *difficult* child is often in a negative mood, has irregular body functions, shows high-intensity reactions, withdraws from new stimuli, and is slow to adapt to new situations. The difficult child sleeps and eats on an unpredictable schedule, cries a good deal (and loudly), and has trouble adjusting to new routines.

■ The *slow-to-warm-up* child is somewhat negative in mood, has a low level of activity and intensity of reaction, and withdraws from new stimuli. However, with repeated exposure to new experiences, she or he begins to show interest and involvement.

KEY THEME**Child's Active Role**

Chess and Thomas (1991) note that children with different temperaments will evoke different patterns of reactions from their parents, teachers, and peers. “Easy” children usually elicit the most positive reactions from others, whereas children from the other two temperament categories typically draw more negative reactions. Later in life, children with “easy” temperaments may adjust more readily to important transitions, such as the start of school or making new friends. An important dimension of development, say Chess and Thomas, is the “goodness of fit” between the child’s temperament and the demands placed on the child by the environment, specifically parents, teachers, peers, and others.

Other researchers have proposed alternative descriptions of temperament types. For example, Jerome Kagan and his colleagues (Kagan et al., 1984; Kagan, Reznick, & Snidman, 1988) noted that some infants tend to show wariness and fearfulness when they encounter unfamiliar people, objects, or events, and others react with interest, spontaneity, and sociability. Longitudinal studies show that both the first group, called *inhibited*, and the second, called *uninhibited*, tend to maintain their distinctive styles from infancy through adolescence.

Mary Rothbart and her colleagues (Rothbart, 1986; Rothbart, Derryberry, & Posner, 1994) have offered another increasingly popular description of temperament. Infants are thought to differ in terms of *reactivity*, or how easily the child becomes aroused in response to events in the environment. Some children react quickly and intensely, whereas others are slower to react and are generally calmer. A second dimension of temperament in this model is the ability to *regulate the self*, to adjust one’s level of arousal and to soothe oneself. Some children are better able than others to shift their attention or to inhibit behaviors in order to bring themselves back to a calm state.

One caution about categorizing infant styles concerns the cross-cultural dimensions of temperament. Although the preceding categories may capture individual differences in the emotional styles of Western infants, they may not apply to children from other cultures. For example, when Japanese mothers were asked to describe the behavioral styles of their infants, the “easy/difficult” dimension appeared in their responses, but so did unique qualities such as “self-assertiveness” (e.g., a tendency to like pleasant sounds, enjoy exercising the body, and feed quickly) (Shwalb, Shwalb, & Shoji, 1994). Cultural differences in parental expectations regarding children’s temperament may, in turn, lead to differences in parenting styles that circle back to influence the child’s style of responding to people and objects.

KEY THEME**Sociocultural Influence**

● **Biological Bases of Temperament** There are good reasons to believe that individual differences in temperament are rooted in biology. For example, children in Kagan’s two temperament categories show different profiles of physiological responsiveness. Inhibited children show more pronounced cardiac reactions, a greater rise in blood pressure when changing from a sitting to a standing position, and more tension in skeletal muscles compared with uninhibited children. As adolescents, inhibited children exhibit a greater response of the brain stem to auditory stimulation (Woodward et al., 2001). Kagan and his colleagues postulate that differential responsiveness in the limbic system, the portion of the brain below the cortex that controls emotions, may lie at the root of temperament differences (Kagan, Snidman, & Arcus, 1993).

Infants who are prone to be irritable also show distinct patterns of brain wave functioning. In one study, infants were observed as they saw and heard novel stimuli; their level of motor activity and emotional responses were of particular interest. Then, when the infants were nine months of age, patterns of EEG activity were measured. Compared with other infants in the study, active, irritable children who were hard to soothe at four months of age showed greater brain wave activity in the right frontal lobe, the portion of the brain thought to be involved in the expression and processing of emotions (Tucker, 1981). These same infants, at twenty-four months of age, tended to be fearful and inhibited (Calkins, Fox, & Marshall, 1995).

Stephen Porges and his associates (Porges, Doussard-Roosevelt, & Maiti, 1994) have focused on *cardiac vagal tone* as a physiological component of temperament. This measure assesses the degree to which the heart is influenced by the vagus nerve, one of the

KEY THEME**Nature/Nurture**

principal nerves in the autonomic nervous system originating in the brain stem. Infants who show high baseline cardiac vagal tone tend to be reactive; they respond both positively and negatively in stressful situations compared with infants with low cardiac vagal tone (Gunnar et al., 1995; Huffman et al., 1998; Stifter, Fox, & Porges, 1989). In addition, infants who show declines in vagal tone while a series of novel stimuli are presented are more attentive and easier to soothe (Huffman et al., 1998). Perhaps these infants are better able to regulate their emotional states. It is interesting to note that these two patterns of physiological responding—reactivity and self-regulation—correspond to the two major dimensions of temperament proposed by Rothbart.

If individuals differ in the way their bodies tend to react emotionally, then it is logical to presume that genetics plays a role in temperament. As we noted in the chapter titled “Genetics and Heredity,” studies comparing identical and fraternal twins and parents and children on dimensions of temperament suggest that they have a genetic component. Even so, most researchers of temperament agree that biology only sets in place certain predispositions. Any explanation of a child’s personality development most certainly needs to include the complex interplay between initial behavior patterns and environmental experiences (Kagan, 1998; Rothbart & Bates, 1998).

● **Temperament and Later Development** Does early temperament forecast any of the child’s characteristics later in life? It appears so. For example, the extent to which an infant tends to show negative emotions at three months of age predicts poorer cognitive abilities for that child at age four years, even when factors such as the mother’s responsiveness are ruled out as influences on the child (Lewis, 1993). In the domain of social relationships, preschool boys who tend to exhibit negative affect often have poorer social skills and lower status among their peers (Eisenberg et al., 1993). Similarly, infants who tend to express anger and frustration score higher on measures of aggression at age six to seven years than children who express less anger as infants (Rothbart, Ahadi, & Hershey, 1994). Likewise, a relationship exists between a child’s negativism, short attention span, and swings in emotions at age three and hyperactivity, attention problems, and antisocial behavior in adolescence (Caspi et al., 1995). It seems that the relatively stable emotional style a particular child displays early in life may have a far-reaching impact on both cognitive and social functioning later on. According to some researchers, in fact, early temperament styles are likely to have a strong relationship to adult personality types (Rothbart, Ahadi, & Evans, 2000).

KEY THEME

Interaction Among Domains

Sex Differences in Emotions

According to the familiar stereotype, females are more emotionally expressive and more sensitive to the emotional states of others than are males. Do boys and girls actually differ in any facet of emotional development? It seems that for the most part the answer is yes—that girls are more emotionally expressive and more attuned to emotions than are boys.

During infancy and the preschool years, there do not appear to be strong, clear-cut sex differences. Some studies find that girls tend to show more positive emotions than boys (e.g., Matias & Cohn, 1993), but as we discussed at the start of this chapter, Weinberg and her colleagues (1999) found that boys were more expressive in general. By elementary school, though, girls show a greater range of emotions than boys. In one study, when seven- and twelve-year-olds played a game with a peer, girls were more likely than boys to show a positive or negative emotion when the peer made a comment such as “she looks friendly” or “she doesn’t look nice” (Casey, 1993). Later in adolescence, girls smile more than boys both on their own initiative and in response to the smile of another (Hall & Halberstadt, 1986). Girls also begin to show more anxieties than boys during the school years—fears about tests, family issues, health, and other concerns (Orton, 1982; Scarr et al., 1981). Finally, some researchers report that girls are better than boys at decoding the emotional expressions of others (Brown & Dunn, 1996; Hall, 1978, 1984).

Girls may be more emotionally expressive than boys as a consequence of the kinds of experiences they have had with their caregivers. For example, mothers tend to be more facially expressive when they play with their preschool-aged daughters than with their sons.



KEY THEME

Nature/Nurture

Observations of parents' behaviors suggest that many of these sex differences may be taught or modeled directly. For example, mothers and fathers spend more time trying to get their infant daughters to smile than they do their infant sons (Moss, 1974). Mothers of preschoolers also mention feeling states more often and discuss a wider variety of emotions when they talk with their daughters than when conversing with their sons (Dunn, Bretherton, & Munn, 1987; Kuebli, Butler, & Fivush, 1995). Mothers are also more facially expressive when they play with their two-year-old girls than with boys, thus exposing girls to a greater range of emotions and displaying more social smiles to them (Malatesta et al., 1989). In general, parents encourage girls to maintain close emotional relationships and to show affection, whereas they instruct boys to control their emotions (Block, 1973). Thus, although biological explanations of sex differences cannot be ruled out completely, many of the emotional behaviors we see in males and females appear to be influenced by their learning histories.

Differences in how boys and girls regulate their emotions are of special interest to researchers trying to identify the precursors of adjustment difficulties in childhood. When girls experience challenges or problems, they tend to employ *internalizing* strategies for coping, such as worrying or becoming anxious or depressed. In contrast, when boys experience difficulties, they tend to engage in *externalizing* behaviors, such as aggression (Rossman, 1992; Zahn-Waxler, Cole, & Barrett, 1991). Understanding the sources of emotion regulation in boys and girls thus has implications for the treatment and prevention of psychological problems that are associated with each sex.

Cultural Differences in Emotions

The tendency of children to express and detect emotions varies as a function of the culture in which they are raised. American children, for example, tend to smile more than Chinese infants (Camras et al., 1998). On the other end of the emotional spectrum, Chinese children are better able to identify fearful and sad situations than are American children, and they cry less (Borke, 1973; Camras et al., 1998). These differences may reflect the child's incorporation of particular cultural beliefs about emotions.

A recent study of two different cultural groups in rural Nepal further illustrates this concept. Pamela Cole and her colleagues (Cole, Bruschi, & Tamang, 2002) studied children in two small villages, each comprising a different ethnic group—one Brahman and

KEY THEME

Sociocultural Influence

the other Tamang. The Brahmins subscribe to a caste system in which strict rules dictate which social groups may interact. They are very oriented to status differences and the power of authority, and they have a great deal of pride in their own ethnic group. The Tamang, on the other hand, place great value on community rather than on the individuals within the group. Resources are shared, and important decisions are made by consulting all group members, in accordance with their Buddhist values of selflessness. How do school-age children in these two very different cultures express emotions? All children were asked to react to scenarios likely to lead to an emotional reaction, such as having a friend snatch away a piece of candy or watching as a parent spills tea all over homework papers. Brahmin children, although they expected to feel anger in such situations, clearly stated that anger should not be expressed, primarily because authority needed to be respected and group orderliness preserved. Tamang children, in contrast, did not express anger; rather, they reported a feeling of *thiken*, or making the mind calm, in accordance with their Buddhist beliefs. American children, also participants in this study, endorsed anger as an appropriate response. This belief is consistent with the value we place on self-assertion and independence in our culture (Cole et al., 2002).

Cultural belief systems extend to the kinds of temperamental styles that are valued. A good example is the dimension of shyness and inhibition. In European American families, this personality profile is often seen as a liability; we expect our children to be outgoing, sociable, and eager to interact with the environment. In Chinese society, though, shyness is a valued trait. Parents and teachers believe that shy children are well behaved, and shy children have positive views of themselves (Chen, Rubin, & Li, 1997; Chen et al., 1999). These cultural beliefs are likely to be expressed in the socialization practices of parents and others.

Finally, cultures differ in the extent to which children are exposed to emotional events. Infants in northern Germany experience frequent separations from their mothers, whereas Japanese infants do not (Saarni et al., 1998). It should not be surprising, then, if children show varying patterns of emotional reactions to the same event—in this case, the mother's departure.

FOR YOUR REVIEW

- What are the different ways in which child temperament has been conceptualized?
- What is the evidence for a biological basis for temperament?
- How is temperament related to later development?
- How do boys and girls differ in the expression of emotions? What factors might be responsible for these differences?
- In what ways does the development of emotion vary across cultures?

Attachment: Emotional Relationships with Others

One of the most widely discussed and actively researched aspects of emotional and social development is **attachment**, the strong emotional bond that emerges between infant and caregivers. The concept of attachment occupies a prominent place in developmental psychology because of its link with successful cognitive, social, and emotional development throughout childhood.

How does attachment emerge between infant and caregiver? In what ways is this emotional bond expressed? What roles do the caregiver and infant play in its formation? What is the significance of attachment in the later development of the child? Do we observe the same patterns of attachment among children across cultures? In this portion of the chapter, we will examine the course of attachment in infancy and early childhood and explore the answers to these questions.

attachment Strong emotional bond that emerges between infant and caregiver.

The Origins of Attachment: Theoretical Perspectives

What forces govern the emergence of attachment? Historically, there have been two important perspectives on this question, learning theory and ethological theory.

KEY THEME

Nature/Nurture

- **Learning Theory** Learning theorists believe that certain basic drives, such as hunger, are satisfied by **primary reinforcers**, rewards that gratify biological needs. In the case of the young infant, an important primary reinforcer is food. Other rewards, called **secondary reinforcers**, acquire their reinforcing qualities from their association with primary reinforcers. Because they are connected repeatedly with the reduction of the hunger drive, mothers acquire secondary reinforcing properties. Eventually the mother's presence in contexts outside feeding is rewarding to the infant.

Is the activity of feeding related to the emergence of infant-mother attachments, as learning theorists predict? Evidently not, according to a series of classic experiments conducted by Harry Harlow and his associates (Harlow & Zimmerman, 1959). These investigators separated infant monkeys from their mothers and provided them instead with extended contact with two surrogate mothers, one a figure made of wire mesh and the other a figure covered with terry cloth. The wire surrogate was equipped for feeding half of the monkeys; the terry-cloth surrogate fed the other half. The infant monkeys lived with both their surrogates for at least 165 days, during which time several observations were made of the monkeys' behaviors. One measure was the number of hours per day spent with each surrogate. As Figure 11.5 shows, infant monkeys preferred the cloth "mother" regardless of which surrogate was providing nourishment. In a subsequent test of attachment, when a frightening stimulus such as a mechanical spider was introduced into the monkeys' cage, the monkeys chose the cloth mother to run and cling to, even if they had been fed by the wire mother.

Harlow's findings challenged the view that attachments are based on the mother's acquisition of secondary-drive characteristics. The fact that the infant monkeys did not seek out the surrogate that fed them under either normal or stressful conditions led Harlow to conclude that "contact comfort," the security provided by a physically soothing object, played a greater role in attachment than the simple act of feeding.

- **The Ethological View** Proponents of the ethological position state that attachments occur as the result of the infant's innate tendency to signal the caregiver and the caregiver's corresponding predisposition to react to these signals. As a result, infant and caregiver are brought together, a bond is forged between them, and the survival of the infant is ensured. In other words, attachment is an adaptive, biologically programmed response system that is activated early in the infant's development and follows many of the principles of *imprinting* described in the chapter titled "Themes and Theories."

The principal spokesperson for this perspective, John Bowlby (1958, 1969), initially was concerned with the detrimental effects of institutionalization on infants and young children. Scientists in the late 1940s had reported that children who spent extended periods of time in hospitals and orphanages during their early years often showed serious developmental problems, including profound withdrawal from social interactions, intellectual impairments, and, in some cases, physical delays (Skodak & Skeels, 1949; Spitz, 1946a). Bowlby proposed that the cause lay in the lack of a close emotional bond between child and primary caregiver.

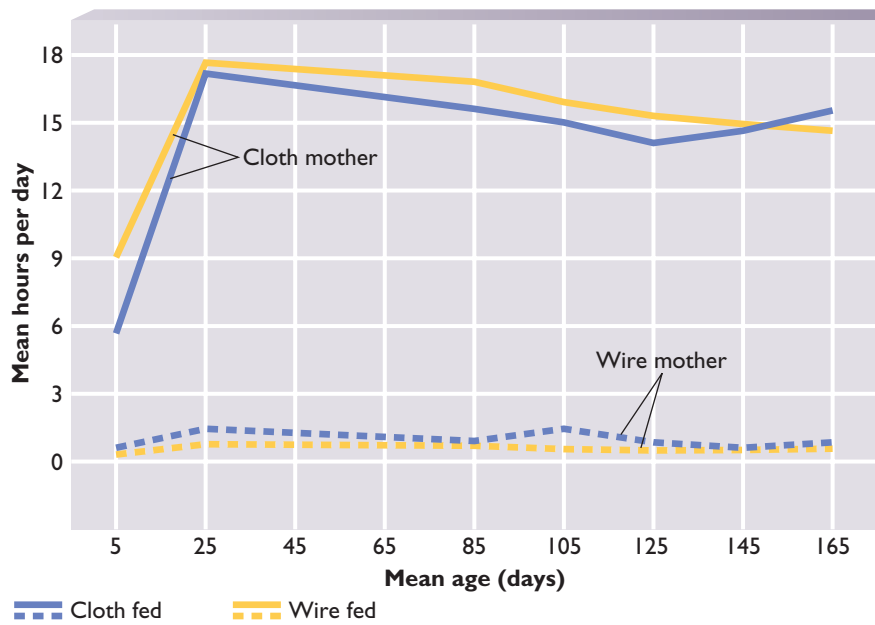
Bowlby (1969) maintained that attachments develop in a fixed sequence:

- In the first two months, infants emit *signaling behaviors*, such as crying and smiling, that bring the caregiver physically close to the infant. Infants emit these signals indiscriminately, but as caregivers respond, stable patterns of interaction emerge.
- Between two and six months of age, smiles and cries become increasingly restricted to the presence of the caregiver, usually the mother.
- From six to twelve months of age, clearer signs of the infant's strong attachment to the caregiver develop. At this point, most infants become visibly upset at the mother's departure, a phenomenon called **separation anxiety**, and also show signs of

primary reinforcer Reward that gratifies biological needs or drives.

secondary reinforcer Object or person that attains rewarding value because of its association with a primary reinforcer.

separation anxiety Distress the infant shows when the caregiver leaves the immediate environment.

**FIGURE 11.5**

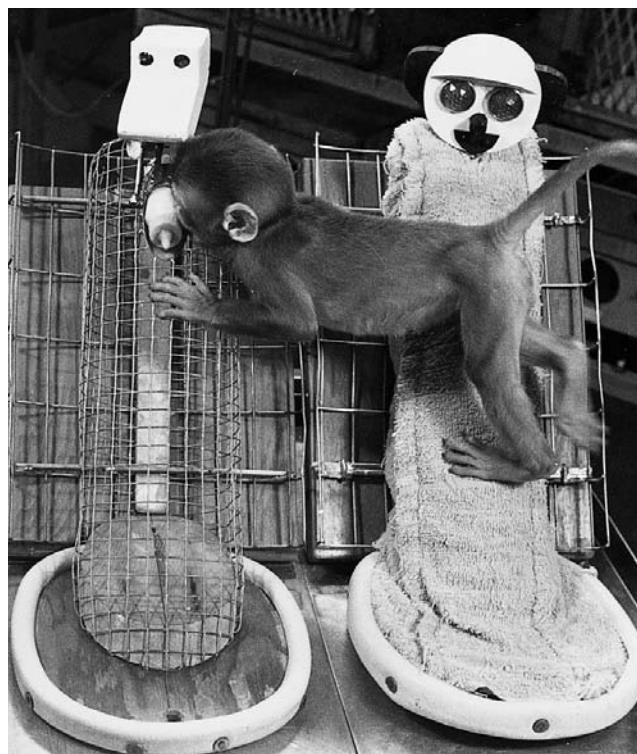
Forming Attachments:
The “Cloth Mother” and
“Wire Mother” Experiment

In Harlow’s research, infant monkeys spent more time with a cloth surrogate mother than with a wire surrogate mother, regardless of which one fed them. This graph shows how much time infant monkeys spent with each surrogate as a function of feeding condition.

Source: Reprinted with permission from Harlow, H. F., & Zimmerman, R. R., “Affectional Responses in the Infant Monkey,” *Science*, 130, 421–432. Copyright 1959 American Association for the Advancement of Science.

reunion behavior, happily greeting the mother on her return. Once they are able to move about, infants will ensure their nearness to their mothers by approaching and clinging to them. About the same time, they also display **stranger anxiety**, a wariness or fear at the approach of someone unfamiliar.

■ The final phase of attachment occurs at about three years of age, when the relationship between mother and child becomes more of a partnership and the child comes to appreciate the mother’s feelings, motives, and goals.



Harlow’s experiments showed that infant monkeys reared with surrogate mothers preferred the cloth mother even when the wire mother provided nourishment. Here, the infant monkey is actually nursing from the wire mother but still maintains contact with the cloth mother. These findings challenge the hypothesis that attachment arises from the caregiver’s association with feeding the child.

reunion behavior The child’s style of greeting the caregiver after a separation.

stranger anxiety Fear or distress an infant shows at the approach of an unfamiliar person.

The regularity with which infants show this sequence of behaviors and the adaptive function they serve, says Bowlby, suggests its biological and evolutionary basis.

According to Bowlby, infants become attached to those who respond consistently and appropriately to their signaling behaviors. Thus Bowlby saw the maladaptive development of institutionalized infants as a consequence of the absence of the dynamic, contingent interaction between child and caregiver. Although institutional settings met children's basic physical needs, they often did so at the convenience of the caregiver's schedule rather than in response to the child's behaviors. Bowlby's general scheme concerning the origins and course of attachment has framed literally hundreds of modern-day investigations of the development of attachment.

The Developmental Course of Attachment

For the most part, research has confirmed the sequence of behaviors outlined by Bowlby in the emergence of attachment. Infants can discriminate their mothers' faces from those of strangers at two days of age and their mothers' voices and odors a few days after that (DeCasper & Fifer, 1980; Field et al., 1984; MacFarlane, 1975). However, they emit their signals to anyone who is available. By about seven months of age, these indiscriminate behaviors give way to attachments to specific people, most notably the mother or primary caregiver. Stranger anxiety becomes full blown, and separation anxiety is usually manifested as well. In the months that follow, children show evidence of multiple attachments to fathers, substitute caregivers, and grandparents (Schaffer & Emerson, 1964).

At age two years most children continue to show strong attachments, but by age three years some of the manifestations of this bond begin to change. Separation distress diminishes for most children, probably due to advances in cognition. For example, children begin to appreciate the fact that even though the caregiver may depart for several hours, she always returns (Marvin, 1977). The impact of repeated experience with separation and reunion episodes may extend to a more general understanding that negative emotional experiences often yield to strong positive affect, that distress can be followed by stability (Schoore, 1994). As children develop insights into the perspectives of others and as their communication skills improve, they can better understand the reasons for temporary separations and can express their emotions in ways other than crying or clinging. The Emotional Development chronology summarizes the sequence of changes in emotional development and attachment.

KEY THEME

Interaction Among Domains

Strange Situation Standardized test that assesses the quality of infant-caregiver attachment.

secure attachment Attachment category defined by the infant's distress at separation from the caregiver and enthusiastic greeting upon his or her return. The infant also displays stranger anxiety and uses the caregiver as a secure base for exploration.

secure base An attachment behavior in which the infant explores the environment but periodically checks back with the caregiver.

avoidant attachment Insecure attachment in which the infant shows little separation anxiety and does not pay much attention to the caregiver's return.

● **Measuring Attachment** The **Strange Situation**, developed by Mary Ainsworth and her associates, is a standardized test frequently employed to measure the quality of the child's emotional ties to her mother (Ainsworth et al., 1978). Table 11.1 shows the eight episodes that compose this measure, which is administered in a laboratory setting.

On the basis of her extensive observations of the patterns of behaviors shown by infants, Ainsworth (Ainsworth et al., 1978) distinguished three patterns of attachment: *secure attachment* and two categories of *insecure attachment*, *avoidant* and *ambivalent attachment*. More recently, other researchers have identified still a third type of insecure attachment called *disorganized/disoriented attachment*. These attachment categories are described as follows:

Secure attachment Children in this group show many clear signs of attachment by displaying stranger anxiety and separation protest and greeting the mother enthusiastically upon her return. They also use the mother as a **secure base** for exploration, exploring their new surroundings but looking or moving back to the mother as though to "check in" with her. They obviously feel comfortable in the presence of the mother and distressed and apprehensive in her absence.

Avoidant attachment Infants in this category are less distressed when the mother leaves and less enthusiastic in greeting her when she returns. They tend to avoid or

TABLE 11.1 The Episodes of the Strange Situation

Episode*	Persons Present	Action	Attachment Behaviors Assessed
1	Caregiver, baby, observer	Observer introduces mother and baby to experimental room and leaves.	
2	Caregiver, baby	Baby explores and plays while caregiver is passive.	Secure base
3	Stranger, caregiver, baby	Stranger enters room, converses with caregiver, and approaches baby.	Stranger anxiety
4	Stranger, baby	Caregiver leaves room unobtrusively.	Separation anxiety
5	Caregiver, baby	Caregiver returns and greets baby.	Reunion behavior
6	Baby	Caregiver leaves room, saying "bye-bye."	Separation anxiety
7	Stranger, baby	Stranger enters and orients to baby.	Stranger anxiety
8	Caregiver, baby	Caregiver returns and greets baby.	Reunion behavior

*Each episode except the first lasts for about three minutes.

Source: Adapted from Ainsworth et al., 1978.

ignore her, playing in isolation even when she is present in the room. All of these behaviors, according to Ainsworth, constitute a form of insecure attachment.

Ambivalent (or resistant) attachment Tension characterizes the behaviors these children show toward their mothers. Although they display noticeable proximity-seeking behaviors when the mother is in the room, sometimes clinging excessively to her, they also show angry, rejecting behavior when she returns, even hitting or pushing her away. Some children in this category are extremely passive, showing limited exploratory play except for bouts of crying that are used as signals to be picked up and held. These children, too, are considered insecurely attached.

Disorganized/disoriented attachment Children in this attachment category show fear of their caregivers, confused facial expressions, and an assortment of avoidant and ambivalent attachment behaviors in the Strange Situation (Main & Solomon, 1986). These behaviors are accompanied by physiological signs of stress (Hertsgaard et al., 1996).

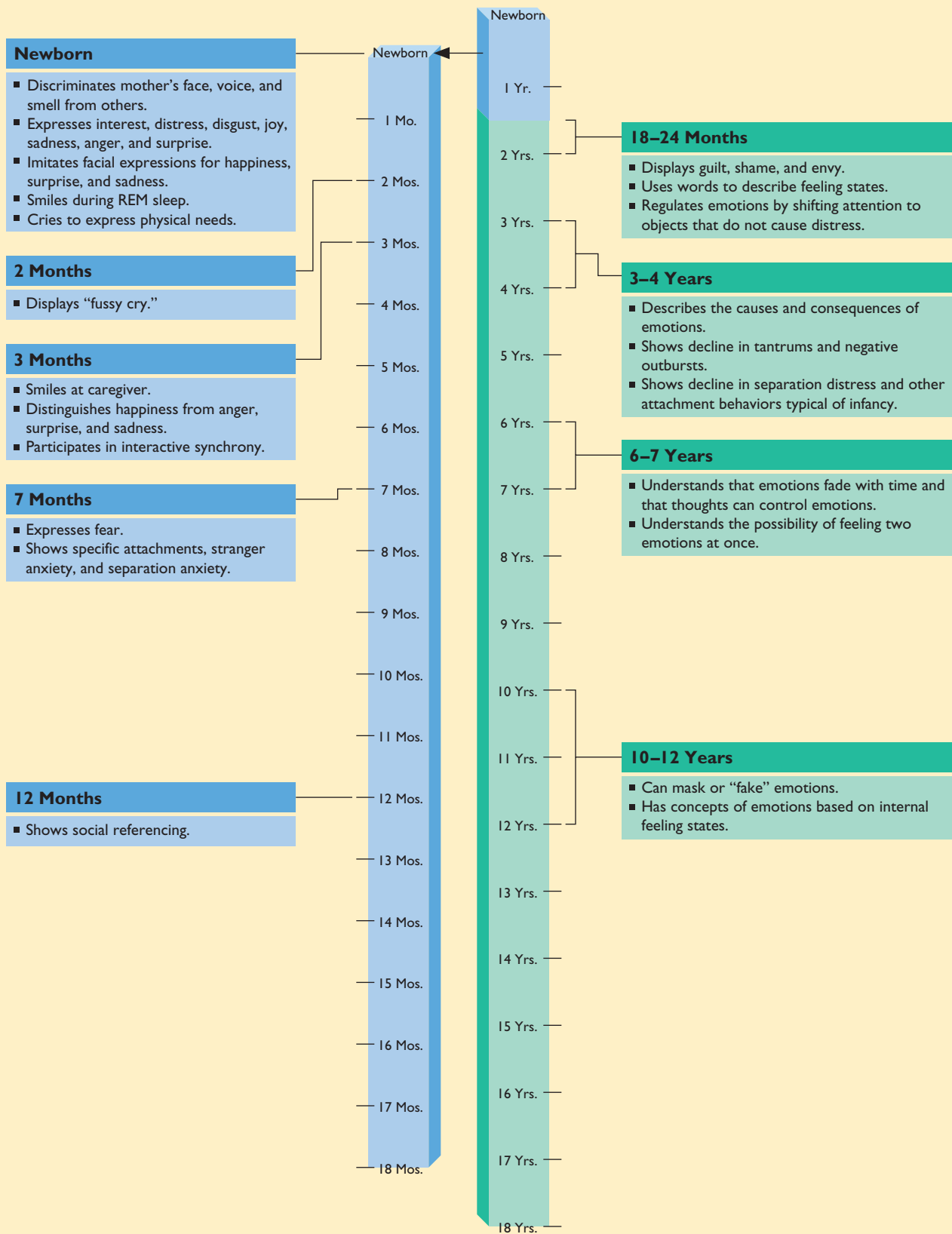
In the United States, about 65 percent of infants are typically categorized as securely attached, about 20 percent as avoidantly attached, and about 10 percent as ambivalently attached (van IJzendoorn & Sagi, 1999). Other data suggest that perhaps as many as 15 percent of infants show signs of disorganized attachments (Lyons-Ruth & Jacobvitz, 1999).

A newer way to measure attachment is the *Q-sort*. In this method, mother and infant are observed for a specified period of time, after which the observer sorts

ambivalent (resistant) attachment Insecure attachment in which the infant shows separation protest but also distress upon the caregiver's return.

disorganized/disoriented attachment Infant-caregiver relations characterized by the infant's fear of the caregiver, confused facial expressions, and a combination of avoidant and ambivalent attachment behaviors.

CHRONOLOGY: Emotional Development



This chart describes the sequence of emotional development based on the findings of research. Children often show individual differences in the exact ages at which they display the various developmental achievements outlined here.

through a series of 90 cards containing descriptions of the mother-infant relationship. Several piles are created, from “least characteristic” to “most characteristic” of the child. The child’s attachment score is based on the extent to which these ratings correlate with the characteristics of a securely attached child defined by a panel of experts on childhood attachment (Waters & Deane, 1985). The use of the Q-sort has permitted researchers to study attachment in a broader range of contexts and in a wider age range of children than has the Strange Situation (Thompson, 1998).

● **The Antecedents of Secure Attachment** How do secure, high-quality attachments develop? Research by Mary Ainsworth and her colleagues (Ainsworth, Bell, & Stayton, 1971, 1972, 1974) suggests that the mother’s style of interacting with her infant and her responsiveness to the baby’s signals are key factors.

Ainsworth and her associates visited the homes of twenty-six infants and their mothers for about four hours every three weeks during the entire first year of the infants’ lives. When they were about one year old, the infants were brought to the laboratory to be tested in the Strange Situation and were classified according to the quality of attachment to their mothers. An attempt then was made to find relationships between the attachment classification and specific maternal behaviors observed earlier. The results of this study indicated that mothers of securely attached infants were *sensitive* to their children’s signals, noticing their cues and interpreting them correctly. These mothers were *accepting* of their role as caregiver. They displayed *co-operation*; mothers of securely attached infants would wait until the child finished her activity or was in a good mood before imposing a request. They used gentle persuasion rather than assertive control. Mothers in this group were also *accessible*, providing quick responses to the child’s signals, particularly crying. They were not distracted by their own thoughts and activities. In contrast, mothers of the insecurely attached group were often rigid, unresponsive, and demanding in their parenting style and did not feel positively about their role as caregiver.

A meta-analysis of sixty-six studies showed that maternal sensitivity is indeed strongly related to attachment (De Wolff & van IJzendoorn, 1997). However, the emotional tone of early mother-child interactions is also important to consider. Mothers of securely attached children have been found to be more affectionate, more positive, and less intrusive in their vocalizations than mothers of insecurely attached infants, toddlers, and young school-age children (Bates, Maslin, & Frankel, 1985; Isabella, 1993; Izard et al., 1991; Stevenson-Hinde & Shouldice, 1995). In a study of children who were about to enter school, those who were insecurely attached and who showed the most behavior problems two years later had mothers who displayed the highest levels of negativity and tension of all the participants (Moss et al., 1998).

Interactive synchrony also influences the emergence of attachments. One group of researchers observed the interactions of mothers and their infants at one, three, and nine months of age, recording each instance in which the infants’ and mothers’ behaviors co-occurred and produced a mutually satisfying outcome. For example, if the infant gazed at the mother, the mother verbalized, or if the infant fussed and cried, the mother soothed him. The infants’ attachments were then assessed at one year of age. According to the results, securely attached infants had experienced a greater number of synchronous interactions in the prior months, a finding other researchers have replicated (Isabella, Belsky, & von Eye, 1989; Scholmerich et al., 1995). Therefore, in accounting for the emergence of secure attachment, it is important to consider maternal behavior *as it is related to the child’s behavior*.

It is worth noting that siblings reared in the same family are at least moderately similar to each other in their attachment classifications and that identical twins are no more similar than fraternal twins in their attachment styles (O’Connor & Croft, 2001; van IJzendoorn et al., 2000). This pattern of results is consistent with the notion that the events that transpire within the family are a key ingredient in shaping attachments.

● **Attachments to Fathers** Because mothers traditionally have fulfilled the role of primary caregiver, most of the emphasis in research has been on the emotional

KEY THEME

Nature/Nurture



Infants show clear signs of attachment to fathers, especially when fathers spend time in rewarding, mutually engaging interactions with them. Research shows that children who have healthy attachments to mothers and fathers show higher self-esteem and greater social competence than children who are securely attached to only one or neither parent.

bond that develops between child and mother. With large numbers of women participating in the labor force, however, and challenges to the assumption that females have the exclusive role in child care, many caregiving responsibilities have been assumed by others either within or outside the family. Moreover, researchers in developmental psychology have begun to recognize the glaring absence of information on how another important family member, the father, interacts with his children. The result has been a growing literature on father-child interaction.

In general, fathers spend less time interacting with and caring for their children than mothers do. Nevertheless, many infants clearly do form attachments to their fathers. In the Strange Situation, infants show signs of separation anxiety when the father leaves the room and greet him on his return. They also use him as a secure base for exploration (Kotelchuk, 1976). In most cases, when infants are attached to their mothers, they are also attached to their fathers (Rosen & Burke, 1999). As is the case with mothers, when fathers spend time in face-to-face interactions with their infants, but particularly when they show sensitivity in their play, their infants show clear signs of attachment to them (Cox et al., 1992; Grossmann et al., 2002). Securely attached infants also tend to have fathers who are sociable, are agreeable, and express positive emotions (Belsky, 1996). Given the opportunity to be nurturant and responsive, fathers certainly can become partners in strong, secure attachments.

Children who have secure attachments to both mothers and fathers show higher self-esteem and greater social competence than children who have secure attachments to only one or to neither parent (Verschueren & Marcoen, 1999). Moreover, healthy relationships with fathers can buffer children who are at risk due to impaired interactions with their mothers. Recall how infants with depressed mothers often have poor quality interactions with them. One group of researchers found that infants with depressed mothers often had more positive interactions with their fathers (Hossain et al., 1994). In adolescence, a positive relationship with the father seems to protect children from the behavior problems associated with having a depressed mother (Tannenbaum & Forehand, 1994). In addition, attachments to fathers predict healthy friendship relationships for adolescents (Lieberman, Doyle, & Markiewicz, 1999). These studies suggest that fathers fulfill a role in the family that simply cannot be ignored.

● **Temperament and Attachment** Caregivers are not solely responsible for the emergence of attachment. Because attachments form in the context of interactions between caregiver and infant, it seems reasonable to postulate that the infant's own style as a communication partner contributes significantly to the growth of an affectional bond.

Several researchers have reported a link between infant characteristics such as irritability and proneness to distress and subsequent attachment behaviors in the Strange Situation (Bates et al., 1985; Goldsmith & Alansky, 1987; Miyake, Chen, & Campos, 1985). For example, two-day-old infants' proneness to distress when a pacifier is removed from their mouths is related to insecure attachment at fourteen months of age (Calkins & Fox, 1992). Similarly, in a study of Dutch infants who were identified as very irritable newborns, 74 percent were classified as insecurely attached at eighteen months of age (van den Boom, 1994, 1995). Yet early irritability does not necessarily predispose children to become insecurely attached. In the same study of Dutch infants, a second group of irritable newborns and their mothers participated in an intervention program that resulted in only 28 percent being scored as insecurely attached later in infancy.

KEY THEME

Child's Active Role

KEY THEME

Individual Differences

RESEARCH APPLIED TO PARENTING

Promoting Secure Attachment in Irritable Infants

The phone call turned out to be from Gwen, Cindy's close friend. The two of them had shared many life experiences since their childhood days, but Cindy still found it remarkable that they had had their babies within three months of each other. Cindy knew, though, that motherhood was a challenge for Gwen. Gwen's son, unlike Michael, was

hard to figure out and to keep happy. He didn't seem to like being held very much and was often cranky both before and after feeding. Gwen was a loving mother, but at times she was at her wits' end trying to think of ways to soothe her baby. When Cindy picked up the phone, she could tell from Gwen's voice that she was looking for advice on how to handle her difficult child.

What can parents do if their infant is born with a “difficult” temperamental style, showing more negative than positive emotions, fussing and crying, and smiling infrequently? Research carried out in the Netherlands in which mother-child interaction was observed in the home monthly up until the infants were six months of age shows that mothers of irritable infants displayed distinct patterns of reactions. They exhibited less visual and physical contact with their babies, were less involved with them, and responded less when their babies smiled or showed other positive social behaviors (van den Boom & Hoeksma, 1994). Although many of the differences between mothers of irritable and nonirritable infants disappeared by the time their children were six months old, such negative parent-child interactions may predispose children to develop insecure attachments.

In a second study (van den Boom, 1994, 1995), mothers of irritable newborns were randomly assigned to either an intervention group or a control group when their infants were six months of age. During three in-home training sessions conducted every three weeks, mothers in the intervention group were taught to be more responsive to the cues their infants provided. The infants and mothers were observed again when the children were twelve, eighteen, twenty-four, and forty-two months of age. The benefits of the intervention were clear: children in the experimental group were far more likely to be securely attached than children in the control group, even into toddlerhood. These children were also more cooperative, displayed fewer behavior problems, and engaged in more activities and verbal interactions with their mothers than the control group children. Even though mothers had received training up to several years earlier, they continued to show responsive, sensitive parenting.

What exactly were mothers in the intervention group taught? Following are the essential ingredients of the training package:

1. *Attend to the infant's signals, especially by imitating the baby's behaviors and repeating one's own verbalizations.* If the infant coos, respond by making a similar sound. When speaking to the infant, say words slowly and repeat them. If the infant averts his gaze, remain silent, because gaze aversion often means the caregiver has not interpreted the child's signals correctly. These techniques aim to slow down the tempo of mother-infant interactions and to simplify them. The overall goal of these procedures is to help the mothers perceive and interpret infant signals accurately.
2. *Try to soothe the fussing or crying infant.* Because some infants seem to respond negatively to being cuddled or held in close physical contact, try to find a technique suitable for the particular child and her preferences, for example, feeding or vocalizing to her. Once an effective technique is identified, stick with it. Again, the idea is to avoid rapid changes in maternal behavior that might create further frustration and distress in the infant.
3. *Pay attention to the infant's positive signals instead of focusing on his negative behaviors.* Mothers of irritable infants are often so focused on their negative behaviors that they ignore the infant's positive signals. Create opportunities for positive interactions. Play with the infant using games and toys, paying attention to how he or she responds, especially if the response is a smile or a laugh.

In general, the goal of the program was to help mothers correctly read and respond to their own infants' signals, characteristics of mothering that Ainsworth's early studies identified as precursors of secure attachment. As the results described earlier indicate, infants who participated in this intervention showed many desirable outcomes even years after the intervention itself was terminated.

KEY THEME**Interaction Among Domains**

● **Attachment and Later Development** The importance of attachment has been underscored by research findings showing that secure attachments are related to positive developmental outcomes in both social and cognitive spheres when children become older. Leah Matas and her associates assessed the quality of attachments of forty-eight infants when they were eighteen months of age (Matas, Arend, & Sroufe, 1978). Six months later, these same children were observed for the quality of their play and their problem-solving styles. Children who had earlier been categorized as securely attached were more enthusiastic and compliant with their mothers' suggestions in the problem-solving tasks and showed more positive affect and persistence than their insecurely attached counterparts. They also engaged in more symbolic play and displayed less crying and whining. Other researchers have noted that securely attached children show advantages in language acquisition and cognitive reasoning from toddlerhood well into the middle school years and adolescence. Perhaps the secure child's readiness to explore the environment provides the kind of intellectual stimulation that leads to better cognitive performance (Jacobsen, Edelstein, & Hofman, 1994; Meins, 1998). Perhaps, too, the style of maternal interaction that leads to secure attachment also promotes language and cognitive development.

Securely attached children have also been found to be more socially competent with their peers as preschoolers, showing more leadership, greater sympathy, less aggression, and less withdrawal from social interactions (DeMulder et al., 2000; Waters, Wippman, & Sroufe, 1979). They evidence stronger signs of "ego resiliency" at age five years, meaning they respond to problems in a flexible, persistent, and resourceful manner (Arend, Gove, & Sroufe, 1979). In contrast, insecurely attached infants, particularly those who show avoidant patterns, do not fare so well in the preschool years, according to other research. Children with this attachment classification are found to display many maladaptive and undesirable behaviors, such as high dependency, non-compliance, and poor social skills in peer interactions. They are described by teachers as hostile, impulsive, and withdrawn (Erickson, Sroufe, & Egeland, 1985; Laible & Thompson, 2000). Moreover, avoidant children tend to have negative representations of peers, interpret peers' behaviors as hostile, and become more fearful with age (Cassidy et al., 1996; Kochanska, 2001).

The effects of early attachments may carry over well into adolescence and the adult years. Adolescents who evidence secure attachments to their parents, in the sense of expressing affection for and trust in them, generally have high self-esteem, have a strong sense of personal identity, have fewer depressive symptoms, and display social competence (Cooper, Shaver, & Collins, 1998; Rice, 1990). They also engage in more constructive problem solving when discussing controversial topics, such as dating and household rules, with their parents (Kobak et al., 1993). Longitudinal data also suggest that children who showed the ambivalent attachment pattern as infants are more prone than secure infants to develop anxiety disorders and have poorer social competence in adolescence (Warren et al., 1997; Weinfield, Ogawa, & Sroufe, 1997).

● **Internal Working Models and Later Relationships** One of the most provocative and interesting findings emerging in attachment research is that the quality of an individual's attachment during childhood may influence his interpersonal relationships as an adolescent or adult. In Bowlby's (1973) theory, as children experience ongoing interactions with parents, they develop mental frameworks of those relationships called **internal working models of relationships**. These internal working models can, in turn, influence representations of other close relationships that emerge later in life, such as those with friends and romantic partners. Secure attachments, according to the theory, help foster healthy close relationships later in life; insecure attachments, however, can forecast problems in subsequent close relationships. Consistent with this theory are the results of a meta-analysis of sixty-three studies of attachment that found that secure attachment was more strongly associated with friendship quality than with peer relations in general (Schneider, Atkinson, & Tardif, 2001). In a more direct exploration of how early representations of relationships are

internal working models of relationships Mental frameworks of the quality of relationships with others, developed as a result of early ongoing interactions with caregivers.

related to later representations, Wyndol Furman and his colleagues (Furman et al., 2002) administered the Adult Attachment Interview to a group of high school seniors. This attachment measure requires participants to describe and evaluate their own childhood attachment relations; participants are then placed in the appropriate attachment category based on their responses. Working models of friendships and romantic partners were also assessed, using questions about support, caregiving, and cooperation in these relationships. The results showed a strong relationship between working models of relationships with parents and those with friends, but those with romantic relationships were less strong.

Internal working models of relationships may even extend to how a parent conceptualizes his or her relationship and interacts with the child (Bowlby, 1973; Main, Kaplan, & Cassidy, 1985). Researchers have noted significant relationships between the attachment classifications given to parents through the Adult Attachment Interview and the attachment styles of their infants (Benoit & Parker, 1994; Steele, Steele, & Fonagy, 1996; Van IJzendoorn, 1995). Mothers who have positive concepts of their own attachments express more joy and pleasure in the relationship with their own child; they also display more emotional availability and use more positive and sensitive parenting behaviors (Aviezer et al., 1999; Pederson et al., 1998; Slade et al., 1999).

● **Cross-Cultural Variations in Patterns of Attachment** Overall, children in most countries around the world show behaviors indicating secure attachment even if they have been reared in very different circumstances (Posada et al., 1995; Van IJzendoorn, 1995). Studies of children in Israel are good examples. Many Israeli infants are raised in the group setting of the kibbutz. While parents go to work, children are cared for by the *metapelet*, or caregiver, beginning sometime between six and twelve weeks of age and continuing after the first year. Children go to the group caregiving center (called the “children’s house”) in the morning and return home in the late afternoon, but most of their time is spent with the nonparental caregiver and peers. Do such arrangements interfere with the formation of attachments to mothers? One study showed that 80 percent of infants were securely attached to their mothers; interestingly, however, this finding held true only for infants who came home to sleep for the evening. Some infants sleep overnight at the “children’s house,” in keeping with more traditional practices of the kibbutz; among this group, only 48 percent were securely attached to their mothers (Sagi et al., 1994). Children raised on the kibbutz also showed notable attachments to their metapelet; 53 percent of infants were classified as securely attached to the caregiver (Sagi et al., 1985).

Observations of infants in Germany show a different pattern of results. In one study, about 49 percent of infants were scored as avoidantly attached (Grossmann et al., 1985). As in the Ainsworth studies, these researchers noted a relationship between maternal sensitivity and infant attachment: securely attached infants had mothers who interacted with them in a warm, responsive manner. However, although mothers varied in the sensitivity of responding when infants were two months of age, they did not vary by the time the infants were ten months old; most mothers had *low* sensitivity ratings by this time. Grossmann and her colleagues interpreted their findings in the context of the different attitudes toward child rearing held by parents in Germany and the United States. The emphasis in German culture is on fostering independence in one’s offspring, encouraging the development of an obedient child who does not make demands on the parents. Responding to the infant’s every cry is considered inappropriate. Thus, German mothers’ tendency to pick up their children less frequently and for shorter periods of time and to display less affection reflects the goals of socialization in that culture.

Finally, a recent study of Dogon mothers and infants in northwestern Africa found that, although infants assessed in the Strange Situation fell into the secure attachment category at the same rate as Western samples, no infants were classified as avoidant. Recall that in North America about 20 percent of infants are avoidant.

KEY THEME
Sociocultural Influence

The researchers attribute the results to the fact that Dogon mothers feed their infants on demand, responding immediately to their infants' cries of hunger and distress. The high degree of responsiveness of mothers, say the researchers, makes avoidant behavior highly unlikely (True, Pisani, & Oumar, 2001).

Taken together, these studies suggest that the central ideas of attachment theory hold up under a wide variety of cultural circumstances. They show, in particular, that the mother's sensitivity and responsiveness is indeed related to the type of attachment style the infant displays. Yet some researchers caution that the Strange Situation may not take into account specific cultural practices as they relate to separation of the mother and infant. In Japan, for example, mothers and infants are rarely apart from one another, and infants respond with distress when the mother departs and then returns as part of the Strange Situation. Infants may be classified as insecure when they are really just responding to a breach of cultural practice (Takahashi, 1990). More broadly, say the critics, theorists need to consider the goals of socialization in a particular culture; not all cultures may value the emergence of independence and exploration as we do in our culture. Nor do all cultures define maternal sensitivity and responsiveness in the same way. Thus attachment should be studied within the context of a particular culture's belief systems and practices (Rothbaum et al., 2000).

● **Child Care and Attachment** One of the most difficult decisions many parents face concerns alternative child care arrangements when they work. As Table 11.2 shows, almost 70 percent of mothers with preschool-age children work, and almost 60 percent of women with infants under one year of age are employed (U.S. Bureau of the Census, 2001). In fact, this latter group represents the fastest growing category of women in the labor force. A substantial number of children are therefore receiving nonparental care, many beginning very early in life. Does this form of early experience influence the formation of attachments?

One problem in answering this question is that many variables operate when the child receives nonparental care. Is it the mother's absence or the quality of substitute care that produces any observable effects on child behavior? These two factors are difficult to separate. Does it matter whether the child receives full-time or part-time care? Perhaps, but the tremendous variation in caregiving schedules has made this factor difficult to control in research studies. In addition, the kinds of alternative care children receive vary a great deal, ranging from a single caregiver coming to the home to out-of-home family daycare in which another parent provides care for several children to center-based care.

Studies conducted in the 1980s suggested that children in daycare behaved differently than home-reared children on some components of the Strange Situation. Although daycare children showed similar patterns of separation anxiety when the mother departed, a sizable minority showed avoidant responses when reunited with their mothers (Clarke-Stewart & Fein, 1983). This pattern was especially true for infants who received more than twenty hours per week of nonmaternal care, although even among this group over 50 percent of infants formed secure attachments (Belsky & Rovine, 1988). The most recent information, though, shows that early daycare experiences do not put children at risk for insecure attachments. In a major study involving more than one thousand infants attending ten centers, researchers found that children who attended daycare did not differ from home-reared children in their behaviors during reunions with their mothers and in overall attachment security. In addition, age at which daycare began, the amount of weekly time spent in daycare, the quality of care, and the type of care (e.g., home with a relative, home with a non-relative, center-based care) did not influence children's attachments in infancy or during the preschool years. There were some conditions under which insecure attachments were more likely, however: when maternal insensitivity co-occurred with extensive or poor quality child care. In these cases, children were particularly at risk for ambivalent attachments (NICHD Early Child Care Research Network, 1997; 2001).

Age of Child	Percentage of Women in the Labor Force		
	1975	1985	2000
Under 18	44.9	60.8	70.6
Under 6, total	36.7	53.4	62.8
Under 3	32.7	50.5	59.0
1 year or under	30.8	49.4	58.3
2 years	37.1	54.0	61.9
3–5 years	42.2	58.4	68.4
6–13 years	51.8	68.2	75.8
14–17 years	53.5	67.0	80.6

Source: Data from U.S. Bureau of the Census, 2001.

TABLE 11.2

Labor Force Participation Rates for Women with Children Under Age 18

This table shows the percentage of women with children under age eighteen who are employed outside the home (the table shows only the data for married women whose husbands are present in the home). The participation rates for this group of women have grown rapidly since 1975, especially for those with children age one year and under.

A recent study conducted in Australia reiterates that what is important is the attitude and behaviors of the mother. The researchers found that mothers who returned to work by the time an infant was five months of age and who were committed to combining their roles as mothers with their work roles were more likely to have secure infants. These mothers, as it turned out, were also less anxious about child care and were more sensitive in their parenting styles (Harrison & Ungerer, 2002). Taken together, the studies on child care and attachment indicate that what matters most is the context in which child care is taking place—the emotional climate that parents create in the home and the quality of the interactions infants have with their parents.

Disruptions in Attachment

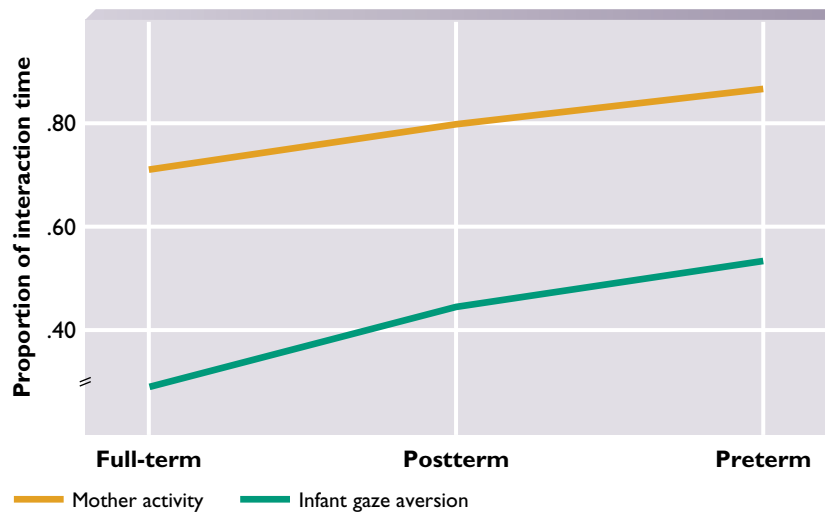
In some contexts, the ideal pattern of caregiver-child interaction may be disrupted, for example, when mother and infant are physically separated during the early days of their partnership due to the infant's premature birth or when the child is placed for adoption and nonbiological parents assume the caregiving role. Other children are the victims of physical abuse or neglect. Is there any evidence that attachments suffer in such cases? A consideration of these issues will further illuminate the ways in which early caregiver-child relationships influence subsequent child development.

- **Prematurity** The preterm infant looks and behaves differently from the infant with the benefit of a full thirty-eight weeks in utero. In all likelihood, the premature infant will be very small and fragile looking, less alert and responsive to stimulation, and more difficult to comfort. Cries, but not smiles, are very frequent (Goldberg, 1979). In addition, mothers and their premature infants usually are separated physically, sometimes for several weeks, while the babies receive the medical care necessary to ensure their well-being and even survival. If attachments were based largely on mutually rewarding infant-caregiver interactions, we might expect premature infants to develop insecure attachments with their mothers.

In the hospital nursery, mothers of premature infants indeed behave in a markedly different manner than mothers of full-term infants do. Mothers of premature babies touch, hold, and smile at their babies less often than do mothers of full-term infants (DiVitto & Goldberg, 1979). As their babies get older, however, mothers of premature infants actually become more active than mothers of full-term babies in stimulating them: They initiate and maintain more interactions, even to the point of being excessive. These behaviors may stem from the mother's desire to alter the premature's unresponsive pattern or to stimulate the child in an effort to spur slowed development. As Figure 11.6 shows, infants often react to these maternal behaviors by averting their gaze, as though to shut out the added stimulation (Field, 1977, 1982).

FIGURE 11.6
Maternal Interactions
with Premature Babies

After an initial period of inactivity following the births of their children, mothers of premature infants become more active in their exchanges with their infants than mothers of full- and postterm infants. At the same time, premature babies display more gaze aversion, as though they are seeking to terminate their mothers' overstimulation.



Source: Adapted from Field, 1982.

Given the differences in maternal styles with premature babies, is there a corresponding impact on the attachments of these infants? In a comparison of twenty full-term and twenty premature infants at eleven months of age, Ann Frodi and Ross Thompson (1985) observed no significant differences in the patterns of attachments. Most of the children in both groups were observed to be securely attached. By one year of age, many premature infants “rebound” from the negative effects of early birth, especially if they encounter a responsive, supportive environment. Mothers may also adapt their styles in later months to conform more closely with the rhythms and needs of the child. Thus the early developmental risk posed by prematurity does not automatically lead to persistent problems in mother-child relations or other developmental patterns. On the other hand, very-low-birthweight infants—those under 1,250 grams—have been found to be at risk for insecure attachments at nineteen months of age (Mangelsdorf et al., 1996). These infants in particular may present greater stresses and challenges for their caregivers.

● **Adoption and Foster Care** By the time they reach middle childhood and adolescence, adopted children show a noticeably higher incidence of psychological and academic problems compared with nonadopted children (Brodzinsky et al., 1984; Fergusson, Lynskey, & Horwood, 1995; Sharma, McGue, & Benson, 1998). They are at greater risk for substance abuse, health problems, emotional distress, and fighting (B. C. Miller et al., 2000). Because most adoptions involve the separation of the child from the biological parent during infancy, the disruption of the attachment process may be a factor.

KEY THEME

Continuity/Discontinuity

Investigations of this issue showed that separation of the infant from the biological parents at six to seven months of age can produce socioemotional difficulties even ten years later, particularly in the child's ability to form relationships with others (Yarrow et al., 1973). Separation at an earlier age, however, may have a lesser impact. When Leslie Singer and her colleagues assessed the attachments of adopted and nonadopted infants between thirteen and eighteen months of age, they found no difference in the classifications of attachments between these two groups (Singer et al., 1985). Most of the infants fell into the securely attached category. In this group, most of the adoptive placements had occurred at fairly early ages, the majority by three months of age. At this age children have not yet developed the early manifestations of attachment, such as stranger and separation anxiety. It is also im-

portant to keep in mind that maternal sensitivity is important for adopted children, just as it is for biological caregivers and their infants. In a recent Dutch study of 146 children adopted before six months of age, maternal sensitive responsiveness—more than such factors as the child's temperament or gender—predicted better cognitive and social functioning when these children were seven years old (Stams, Juffer, & van IJzendoorn, 2002).

Although the studies of adoption generally suggest that early placement is better for children than later placement, the findings on the importance of caregiver sensitivity have relevance for another group of children who experience disrupted relationships with their biological parents—foster children. Mary Dozier and her colleagues (Dozier et al., 2001) found that infants placed in foster homes at age eighteen months can still develop secure attachments provided that their caregivers both value relationships and had strong attachments to their own parents. This pattern occurred even if the infants had experienced neglect, physical abuse, and frequent turnover in caregivers. These data speak to the remarkable resilience of young children when they are provided with loving, nurturant homes.

- **Abuse** Physically or psychologically abused children are at risk for an assortment of cognitive and socioemotional difficulties. Because the trauma that accompanies within-family violence can be enduring, especially with repeated episodes of abuse, it is not surprising that attachments between abused children and their parents take on an aberrant character.

Infants and toddlers who have been maltreated by their caregivers are likely to fall into the category of insecure attachment, called *disorganized/disoriented attachment*. Approximately 80 percent of maltreated infants fit this attachment profile (Carlson et al., 1989; Cicchetti, Toth, & Lynch, 1995). Like other attachment categories, the disorganized/disoriented pattern may predict later developmental outcomes. In one study, 71 percent of preschoolers who showed high levels of hostile behavior toward peers had been categorized as having disorganized attachments during infancy (Lyons-Ruth, Alpern, & Repacholi, 1993). In another, researchers found that when children with disorganized/disoriented attachments were six years old, they tended to be depressed, disorganized in behavior, and even self-destructive in response to questions about their parents or family life (Main et al., 1985). Disorganized children also tend to express more anger over time (Kochanska, 2001).

Why do these maladaptive attachments form? Abusive parents tend to react negatively to many of their children's social signals, even positive ones. When Ann Frodi and Michael Lamb (1980) observed the reactions of abusive and nonabusive mothers to videotapes of smiling and crying infants, abusive mothers were more aroused physiologically by both cries and smiles than were nonabusive mothers and were less willing to interact with an infant, even a smiling one. These findings suggest, at the very least, that the abused infant has an unwilling and psychologically distant interaction partner. In addition, mothers of disorganized/disoriented children tend to be intrusive and insensitive in their parenting styles independent of the temperamental characteristics of their children (Carlson, 1998).

Studies of premature and adopted children reveal that secure attachment relationships can develop in circumstances that are less than optimal during the early part of infancy. At the same time, however, when interactions between caregivers and infants deviate too widely from the ideal, especially in terms of the emotional tone of interactions, the consequences for the child can be serious and enduring.

- **Early Emotional Experiences and the Brain** One of the most valuable outcomes of the studies that have been conducted on disrupted infant-caregiver attachments has been an accumulating appreciation for the role of early experiences in children's emotional lives. Recent physiological evidence suggests that changes in the functioning of the nervous system may accompany early social-emotional



**Should a Child's Age
Be Considered in
Custody Cases?**
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KEY THEME

Interaction Among Domains

interactions and, furthermore, that the first two to three years of life may represent a critical period in laying down the “hard-wiring” of emotional responding.

One physiological system that has been examined is the action of the stress hormone *cortisol*. Researchers have observed that infants with a tendency to be fearful, inhibited, or angry sometimes show elevation of the amount of cortisol in their saliva, reflecting their experience of stress (Stansbury & Gunnar, 1994). In one study, though, inhibited infants with secure attachments did not show these typical elevations when confronted with fear-provoking stimuli, as indicated in Figure 11.7 (Nachmias et al., 1996). In contrast, inhibited infants who were insecurely attached did show a rise in levels of cortisol. Because these data are correlational, the usual precautions about interpreting the results apply. Nonetheless, there are some interesting potential implications of studies such as this one. Cortisol is released by the adrenal glands and can influence the hippocampus (which is involved in learning and memory), the frontal areas of the brain, and portions of the limbic system (connected with emotional responding). In animals, excessive exposure to cortisol results in the death of neurons and the atrophy of dendrites. Although the impact of too much exposure to cortisol on the human brain has not yet been studied directly, one implication is that early and prolonged exposure to stress can have negative consequences on the structure of important brain systems. Healthy attachments, however, might buffer those effects (Gunnar, 1998; Gunnar & White, 2001).

Another biochemical substance, the neurotransmitter norepinephrine, has also been implicated in early emotional development. Infant monkeys deprived of contact with their mothers show depressed levels of norepinephrine. Similarly, emotionally disturbed children who have suffered neglect show lower levels of norepinephrine than children not neglected (Rogeness & McClure, 1996). Researchers are beginning to explore the relationship of attachment with this biochemical system as well (Nelson & Panksepp, 1998).

We now know that many of the brain systems involved in emotional responding—the hippocampus, the amygdala, and the prefrontal cortex—are malleable and plastic in early infancy. Because of their malleability, they may be especially vulnerable to the differing types of emotional experiences, positive and negative,

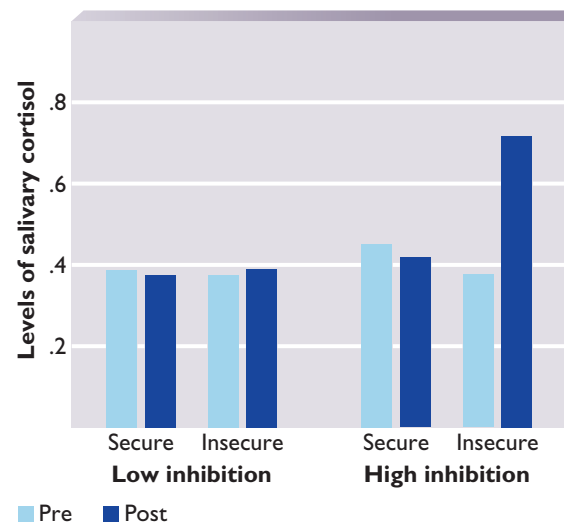
KEY THEME

Continuity/Discontinuity

FIGURE 11.7

Physiological Stress Responses in Young Infants

In a study in which inhibited and uninhibited eighteen-month-olds were exposed to stressful situations (e.g., a noisy mechanical robot), inhibited children showed elevated levels of the stress hormone cortisol, but only if they were insecurely attached. The lightly shaded bars represent baseline levels of cortisol in the saliva prior to the fearful situation, and the darkly shaded bars represent levels of cortisol after the fearful event. These findings suggest that secure attachments might buffer the physiological stress responses of inhibited children.



Source: Adapted from Nachmias et al., 1996.

to which children are exposed (Post & Weiss, 1997). Given these findings, it is vital that researchers continue to explore the role that early emotional experiences play in development.

FOR YOUR REVIEW

- What theoretical perspectives have influenced our understanding of attachment?
- What changes in attachment behaviors are typically seen over the course of development? Which behaviors are special hallmarks of attachment?
- How is attachment assessed in young children? What categories are used to classify children?
- What factors have been shown to promote secure attachments?
- What are the consequences of attachment styles for later development?
- How are attachment behaviors similar or different across cultures? What is the significance of these findings?
- What is the impact of child care on attachment?
- What do the cases of prematurity, adoption, and abuse tell us about the concept of attachment?
- What is the relationship between early emotional experiences and the development of the brain?

CHAPTER RECAP

SUMMARY OF DEVELOPMENTAL THEMES

■ **Nature/Nurture** *What roles do nature and nurture play in emotional development?*

As has been stressed throughout this chapter, both nature and nurture contribute to the child's emotional development. Biology assumes a larger role in the child's early emotional capacities, for example, in the infant's ability to express and detect basic emotions such as joy and sadness. However, socialization and cognitive development become more prominent explanations for later emotional expression, particularly for self-conscious emotions such as guilt and envy. Ethologists and child temperament researchers also maintain that nature guides the formation of attachments between children and caregivers, but other researchers suggest that qualities of parenting style are equally important.

■ **Sociocultural Influence** *How does the socio-cultural context influence emotional development?*

Different cultures place varying emphasis on emotionality itself and on the specific emotions considered appropriate to display. For example, Chinese infants smile and cry less than American infants. A culture's beliefs and values also can influence the child's responses in the Strange Situation. For example, Japanese children are more frequently classified as insecurely attached, but their behavior may simply reflect a response to changes in normative cultural practice.

■ **Child's Active Role** *How does the child play an active role in the process of emotional development?*

The child is hardly passive in the construction of his or her emotional repertoire. There are numerous examples of how the child plays an active role in emotional development, including the phenomenon of social referencing, the infant's role in producing interactive synchrony with the caregiver, and the role of the child's temperament in the formation of attachments.

■ **Continuity/Discontinuity** *Is emotional development continuous or discontinuous?*

Attachment patterns established during the first year of life endure for relatively long periods of time and forecast many desirable developmental outcomes. Thus many researchers believe that infancy is a sensitive period for the formation of attachments. Studies of adopted children in particular suggest that better socioemotional outcomes result when infants are placed with their adoptive parents prior to age six months.

■ **Individual Differences** *How prominent are individual differences in emotional development?*

Individual differences are especially evident in the enduring emotional moods infants and children display. For example, children may be "easy," "difficult," or "slow to warm up" in

temperament or may display inhibited or uninhibited styles. These relatively stable individual differences may affect how parents and others react to the child and, in turn, influence other developmental outcomes such as attachment.

■ **Interaction Among Domains** *How does emotional development interact with development in other domains?*

Emotions are closely intertwined with both cognition and social behavior. On the one hand, cognitive achievements, such

as the ability to interpret social and personal experiences, lay the groundwork for advances in attachment and emotional expression. Similarly, children often learn about emotions through social experiences, such as interactions with their caregivers. On the other side of the equation, successful emotional development in the form of attachment is associated with positive social and cognitive achievements later in childhood. Children who are skilled at understanding, expressing, and regulating emotions also have better relations with their peers.

SUMMARY OF TOPICS

What Are Emotions?

- *Emotions* are a complex set of behaviors produced in response to some event; they motivate action.
- Emotions have physiological, expressive, and experiential components.

The Functions of Emotions

- Emotions can regulate overt actions, influence cognitive processing, and, most important, initiate, maintain, or terminate social interactions with others.

Measuring Emotions

- Because of their varied dimensions, emotions can be measured in an assortment of ways. Physiological measures (such as heart rate, EEGs, and fMRI), analyses of observed facial expressions, and self-report measures have all been used to study emotions.

Theoretical Perspectives on Emotional Development

- Ekman and Izard believe that emotions are biologically based. Cross-cultural similarities in the recognition of emotion expressions and the display by young infants of basic emotions (such as joy and disgust) are consistent with a biological point of view.
- Cognitive-socialization theorists such as Lewis and Michalson emphasize the child's knowledge about the appropriate times and ways of expressing emotions. This knowledge is gleaned from socialization experiences.
- Social-contextual theorists such as Campos and Saarni believe that emotions must be understood as processes embedded in social interactions. The positive or negative tone of emotions and their intensity, rather than categories of discrete emotions, are emphasized.

Expressing, Understanding, and Regulating Emotions

Early Emotional Development

- *Basic emotions*, such as joy, sadness, and surprise, are observed in infants from birth.

- The forms of emotional expressions, such as smiling and crying, change over the first year. Smiling shifts from a reflex-like behavior to a controlled, voluntary response important to social interactions with the caregiver. Crying changes from a way of expressing physical needs to include demands for objects and actions.
- Young infants can discriminate and imitate basic facial expressions.
- *Social referencing*, looking to another individual for emotional cues on how to act, indicates that the infant interprets emotional expressions as having meaning.
- Infants' emotional expressions often co-occur in a synchronous manner with those of caregivers in a dynamic called *interactive synchrony*. Infants may learn important lessons about the rules of interaction and the ability to regulate interactions in the context of these, as well as of asynchronous interactions, as studies of depressed mothers and their infants show.

Later Emotional Development

- Starting in the preschool years, children show *self-conscious emotions* such as shame, guilt, and jealousy.
- Preschoolers begin to understand many of the situations that give rise to specific emotions and the consequences of displaying them. School-age children begin to appreciate cultural *display rules* that dictate when and how emotions should be displayed. They also understand that they can control emotions with their own thoughts and that sometimes two emotions can be experienced simultaneously.
- Knowledge about emotions has important ramifications for children's social development and is learned, at least in part, from interactions with parents. Parents who discuss and explain emotions and who display less negative affect themselves have children with greater understanding of emotions.
- An important developmental achievement is the ability to regulate one's emotions. Infants and young children distract themselves to alleviate distress, and older children use their growing language skills to regulate themselves. The ability to regulate emotions predicts behavioral conduct and the quality of social relationships later in childhood. Here, too, parents who provide supportive guidance and positively toned interactions have children who are better able to regulate their own emotions.

- Adolescents experience more negative emotions and have more negative emotional interactions with their parents than children of other ages. For some, adolescence is a time of increased risk for depression.

Variations in Emotional Development

Temperament

- *Temperament* is a style of behavioral functioning that may include intensity of reactions, distractibility, adaptability, and persistence. Different temperament categories include the easy, difficult, and slow-to-warm-up styles identified by Chess and Thomas, the inhibited versus uninhibited styles researched by Kagan and his colleagues, and the dimensions of reactivity and self-regulation focused on by Rothbart and her colleagues.
- Children with different temperament styles show differences in physiological responses such as heart rate, EEG patterns, and cardiac vagal tone. Thus there is reason to believe that biology plays some part in temperament.
- Early temperament styles predict social behaviors, peer relations, and cognitive functioning later in development.

Sex Differences in Emotions

- Among school-age children, girls are more emotionally expressive and more attuned to emotions than are boys. Research suggests that although a biological explanation cannot be ruled out, many of these sex differences may be modeled by or learned from parents.

Cultural Differences in Emotions

- Different cultures encourage the expression of some emotions over others, depending on the broader values and belief systems they hold. They may also value some temperament styles over others and vary in the degree to which they expose children to emotional situations.

Attachment: Emotional Relationships with Others

- *Attachment* is the strong emotional bond that emerges between infant and caregiver.

The Origins of Attachment: Theoretical Perspectives

- Learning theory has emphasized the mother's association with feeding (a *primary reinforcer*) and other activities the infant finds pleasurable. As a result of this association, she is said to acquire *secondary reinforcing* attributes. Harlow's classic experiments with surrogate monkeys showed that contact comfort played a more important role in attachment than feeding did.
- Ethological theorists view attachment as an innate, adaptive phenomenon that promotes proximity between infant and caregiver and thus ensures the infant's survival.

- Bowlby believed that attachment emerges in a series of four phases during which the infant becomes increasingly emotionally connected with the caregiver. Several behaviors mark the child's emerging attachment to the caregiver at about six months of age. These include *separation anxiety*, *reunion behavior*, and *stranger anxiety*.

The Developmental Course of Attachment

- Research has confirmed the general chronology of attachment behaviors first outlined by Bowlby.
- Attachment is measured by observing the infant's responses to the *Strange Situation*, a standardized laboratory task that assesses the infant's use of the mother as a *secure base* for exploration; stranger anxiety; separation anxiety; and reunion behavior. The different attachment categories include *secure attachment* and three categories of insecure attachment—*avoidant*, *ambivalent* (or *resistant*), and *disorganized/disoriented* attachment.
- Several variables predict the formation of secure attachments, including the sensitivity and responsiveness of the caregiver, the synchrony of child-caregiver interactions, and the temperament of the child. Fathers who are high on sensitivity and responsiveness are fully capable of being the objects of attachment.
- Security of attachment predicts a number of important developmental outcomes, including cognitive performance, social competence, and high self-esteem.
- The child's *internal working models of relationships*, derived from his or her attachment relationship, can forecast the nature of other close relationships later in life, such as close friendships and parenthood.
- Although the proportion of infants placed into the various attachment categories can vary cross-culturally, these studies still confirm that maternal sensitivity is an important factor in the emergence of secure attachment. However, it is important to consider the goals of socialization in a particular culture as attachment concepts are applied in different cultural contexts.
- The most recent data show that, in general, early experiences in child care do not lead to disruptions in attachment. Rather, it is important to consider the emotional climate of the home and the quality of interactions parents and infants have when both parents work.

Disruptions in Attachment

- Studies of premature infants, adoptees, foster children, and abused children indicate that attachments can form under less than optimal circumstances but that extreme deviations in caregiver-child interaction patterns can have serious negative consequences for the child.
- There is growing evidence to suggest that early emotional experiences are linked to changes in the underlying physiology of the central nervous system. Changes in the action of cortisol and neurotransmitters have been observed in young organisms that experience prolonged early stress.