

Sample Chapter

Child Development, 9/e

Laura E. Berk

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“Love of Mother”

Name Unknown, 15 years, Korea

Assertively grasping his mother’s hand, a young child ventures confidently into the wider world. A secure attachment bond with a warm, sensitive caregiver provides children with vital support for exploring and mastering their environment.

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Emotional Development

On a spring day, 4-month-old Zach, cradled in his father's arms, arrived at the door of my classroom, which had been transformed into a playroom for the morning. Behind him, led by their mothers, came 13-month-old Emily and 23-month-old Brenda. My students and I spent the next hour watching the three children closely. Especially captivating were the children's emotional reactions to people and objects. Zach grinned gleefully as his dad lifted him in the air, and he responded with an excited giggle to a tickle followed by a lively kiss on the tummy. When I offered Zach a rattle, his brows knit, his face sobered, and he eyed the rattle intently as he mobilized all his energies to reach for it.

Transferred to my arms and then to the laps of several students, Zach remained at ease (although he reserved a particularly broad smile for his father). In contrast, Emily and Brenda were wary. When I offered a toy and coaxed Emily toward it, she pulled back and glanced at her mother, as if to check whether the new adult and tantalizing object were safe to explore. With her mother's encouragement, Emily approached cautiously and accepted the toy. A greater capacity to understand the situation, along with her mother's explanations, helped Brenda adjust, and soon she was engrossed in play. During the hour, Brenda displayed a wide range of emotions, including embarrassment at seeing chocolate on her chin in a mirror and pride as I remarked on the tall block tower she had built.

Emotional development—formerly overshadowed by cognition—is an exciting, rapidly expanding area of research. Our discussion opens with the functions of emotions in all aspects of human activity. Next, we chart age-related gains in children's emotional expression and understanding. We will account for Zach, Emily, and Brenda's expanding emotional capacities as they engage in increasingly complex interactions with their changing physical and social worlds. Our attention then turns to individual differences in temperament and personality. We will examine biological and environmental contributions to these differences and their consequences for future development. Finally, we look at attachment to the caregiver—the infant's first affectionate tie. We will see how the feelings of security that grow out of this bond support the child's exploration, sense of independence, and expanding social relationships. ■

Functions of Emotions

TAKE A MOMENT... Think back over the past day or so. Do you recall feeling happy, sad, fearful, or angry in response to a grade on a test or a conversation with a friend? These events trigger emotion because you care about their outcomes. Your **emotion** is a rapid appraisal of the personal significance of the situation, which prepares you for action. For example, happiness leads you to approach, sadness to passively withdraw, fear to actively move away, and anger to overcome obstacles. An emotion, then, expresses your readiness to establish, maintain, or change your relation to the environment on a matter of importance to you (Campos, Frankel, & Camras, 2004; Saarni et al., 2006).

A number of theorists take a **functionalist approach to emotion**, emphasizing that the broad function of emotions is to energize behavior aimed at attaining personal goals (Barrett & Campos, 1987; Campos, Frankel, & Camras, 2004; Frijda, 2000; Saarni et al.,



Functions of Emotions

Emotions and Cognitive Processing • Emotions and Social Behavior • Emotions and Health • Other Features of the Functionalist Approach

■ BIOLOGY AND ENVIRONMENT:

Parental Depression and Child Development

Development of Emotional Expression

Basic Emotions • Self-Conscious Emotions • Emotional Self-Regulation • Acquiring Emotional Display Rules

Understanding and Responding to the Emotions of Others

Social Referencing • Emotional Understanding in Childhood • Empathy and Sympathy

Temperament and Development

The Structure of Temperament • Measuring Temperament • Stability of Temperament • Genetic and Environmental Influences • Temperament as a Predictor of Children's Behavior • Temperament and Child Rearing: The Goodness-of-Fit Model

■ BIOLOGY AND ENVIRONMENT:

Development of Shyness and Sociability

Development of Attachment

Bowlby's Ethological Theory • Measuring the Security of Attachment • Stability of Attachment • Cultural Variations • Factors That Affect Attachment Security • Multiple Attachments • Attachment and Later Development

■ **CULTURAL INFLUENCES:** *The Powerful Role of Paternal Warmth in Development*

Attachment, Parental Employment, and Child Care

■ **SOCIAL ISSUES: HEALTH:** *Does Child Care Threaten Infant Attachment Security and Later Adjustment?*

- Describe the functionalist approach to emotional development.

2006). Events can become personally relevant in several ways. First, you may already have a goal in mind, such as doing well on a test, so the testing situation prompts strong emotion. Second, others' social behavior may alter a situation's significance for you, as when a friend visits and you respond warmly to her friendly greeting. Third, any sensation or state of mind—a sight, sound, taste, smell, touch, memory, or imagining—can become personally relevant and evoke emotion, positive or negative. Your emotional reaction, in turn, affects your desire to repeat the experience.

In each case, emotions arise from ongoing exchanges between the person and the environment, flexibly serving different functions as the individual's circumstances change (Thompson, Winer, & Goovin, 2011). Functionalist theorists believe that emotions are central in all our endeavors—cognitive processing, social behavior, and even physical health. Let's see how emotions organize and regulate experiences in each domain.



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This 17-year-old, an experienced guitarist, is well-prepared for performance. Nevertheless, he reports that high anxiety sometimes interferes, diverting his attention from the cognitive demands of guitar playing.

Emotions and Cognitive Processing

Emotional reactions can lead to learning that is essential for survival. For example, a caregiver's highly charged "No!" is sufficient to keep most newly walking toddlers from touching an electric outlet or careening down a staircase. The toddler need not experience a shock or a fall to avoid these dangers.

The emotion–cognition relationship is evident in the impact of anxiety on performance. Among children and adults, high anxiety impairs thinking, especially on complex tasks, by diverting attention from cognitive processing to task-irrelevant threatening stimuli and worrisome thoughts (Derakshan & Eysenck, 2009). Emotions can also powerfully affect memory. For example, compared to their less stressed agemates, preschool and school-age children who were highly upset by an inoculation at the doctor's office tended to remember the event better, probably because they focused more attention on the threatening experience (Alexander et al., 2002; Goodman et al., 1991).

The relationship between emotion and cognition is bidirectional—a dynamic interplay already under way in early infancy (Lewis, 1999). In one study, researchers taught 2- to 8-month-olds to pull a string to activate pleasurable sights and sounds. As the infants learned the task, they responded with interest, happiness, and surprise. Then, for a short period, pulling the string no longer turned on the attractive stimuli. The babies' emotional reactions quickly changed—mostly to anger but occasionally to sadness. Once the contingency was restored, the infants who had reacted angrily showed renewed interest and enjoyment, whereas the sad babies turned away (Lewis, Sullivan, & Ramsay, 1992). Emotions were interwoven with cognitive processing, serving as outcomes of mastery and as the energizing force for continued involvement and learning.

Emotions and Social Behavior

Children's emotional signals, such as smiling, crying, and attentive interest, powerfully affect the behavior of others. Similarly, the emotional reactions of others regulate children's social behavior.

Careful analyses of caregiver–infant interaction reveal that by 3 months, a complex communication system is in place in which each partner responds in an appropriate and carefully timed fashion to the other's cues (Weinberg et al., 1999). In several studies, researchers disrupted this exchange of emotional signals by having the parent assume either a still-faced, unreactive pose or a depressed emotional state. Two- to 7-month-olds tried facial expressions, vocalizations, and body movements to get the parent to respond again. When these efforts failed, they turned away, frowned, and cried (Moore, Cohn, & Campbell, 2001; Papousek, 2007). This *still-face reaction* occurs only when natural human communication is disrupted (not to a still-faced doll or to the mother wearing a still-faced mask) and is identical in American, Canadian, and Chinese babies, suggesting that it is a built-in withdrawal response to caregivers' lack of communication (Kisilevsky et al., 1998; Legerstee & Markova,

2007). Clearly, when engaged in face-to-face interaction, even young infants expect their partners to be emotionally responsive. To learn more about the impact of parental depression on children's emotional and social adjustment, consult the Biology and Environment box on page 402.

With age, emotional expressions become deliberate means through which infants communicate, and babies monitor the emotional expressions of others to assess their intentions and perspectives. For example, caregivers initiate nearly all positive emotional exchanges with young babies. But by 9 months, infants become initiators, smiling before the caregiver smiles (Cohn & Tronick, 1987). Furthermore, recall from Chapter 9 that by the end of the first year, babies become increasingly skilled at *joint attention*—following the caregiver's line of regard. In these joint attentional episodes, infants and toddlers pick up not only verbal information but also emotional information. Later in this chapter, we will see that when faced with unfamiliar people, objects, or events, older infants pay close attention to their caregiver's affect, using it as a guide for how to respond. Through this checking of others' emotions, called *social referencing*, young children learn how to behave in a great many everyday situations. One 18-month-old, on first witnessing his newborn sister cry, monitored his mother's reaction. On subsequent occasions, he patted the baby and comforted, "No, no, Peach [her nickname], no tears."

Emotions and Health

Much research indicates that emotions influence children's physical well-being. In Chapter 5, we discussed two childhood growth disorders—*growth faltering* and *psychosocial dwarfism*—that involve emotional deprivation. Many other studies indicate that persistent psychological stress, manifested in anxiety, depressed mood, anger, and irritability, is associated with a variety of health difficulties from infancy to adulthood. For example, stress elevates heart rate and blood pressure and depresses the immune response—reactions that may explain its relationship with cardiovascular disease, infectious illness, and several forms of cancer. Stress also reduces digestive activity as blood flows to the brain, heart, and extremities to mobilize the body for action. Consequently, it can lead to gastrointestinal difficulties, including constipation, diarrhea, colitis, and ulcers (Antoni & Lutgendorf, 2007; Ray, 2004). And stress not only induces illness but results from it—a feedback loop that can cause both to worsen over time.

In a dramatic demonstration of the emotion–health relationship, researchers followed children adopted into Canadian homes who had been exposed to chronic stress as a result of at least 8 months of early rearing in extremely depleted Romanian orphanages, where they lacked adult attention and stimulation and suffered from infectious and dietary diseases—most commonly, intestinal parasites, hepatitis, and anemia. Compared with healthyagemates who had been adopted shortly after birth, these physically ill, emotionally deprived children showed extreme reactivity to stress, as indicated by high concentrations of the stress hormone *cortisol* in their saliva—a physiological response linked to persistent illness and learning and behavior problems, including deficits in concentration and control of anger and other impulses. The longer the children spent in orphanage care, the higher their cortisol levels, even six and a half years after adoption (Gunnar et al., 2001; Gunnar & Cheatham, 2003). In other investigations, orphanage children displayed abnormally low cortisol—a blunted physiological stress response that may be the central nervous system's adaptation to earlier, frequent cortisol elevations (Loman & Gunnar, 2010). Extremely low cortisol interferes with release of growth hormone (GH) and, thus, can stunt children's physical growth.

Fortunately, sensitive adult care helps normalize cortisol production in both typically developing and emotionally traumatized infants and young children. Good parenting seems to protect the young brain from the potentially damaging effects of both excessive and inadequate stress-hormone exposure (Gunnar & Quevedo, 2007; Tarullo & Gunnar, 2006). After adoption into caring families, orphanage children's cortisol production moves toward typical levels, and growth and behavior problems lessen (Gunnar & Vasquez, 2001). Nevertheless, as we saw in Chapter 4 and will see again in this chapter, many institutionalized children adopted after spending much of their first year in deprived institutions suffer from serious, lasting adjustment difficulties.

BIOLOGY and ENVIRONMENT

Parental Depression and Child Development

About 8 to 10 percent of women experience chronic depression—mild to severe feelings of sadness, distress, and withdrawal that continue for months or years. Often, the beginnings of this emotional state cannot be pinpointed. In other instances, depression emerges or strengthens after childbirth but fails to subside as the new mother adjusts to hormonal changes in her body and gains confidence in caring for her baby. This is called *postpartum depression*.

Although it is less recognized and studied, fathers, too, experience chronic depression. About 3 to 5 percent of fathers report symptoms after the birth of a child (Madsen & Juhl, 2007; Thombs, Roseman, & Arthurs, 2010). Parental depression can interfere with effective parenting and seriously impair children's development. Genetic makeup increases the risk of depressive illness, but social and cultural factors are also involved.

Maternal Depression

During Julia's pregnancy, her husband, Kyle, showed so little interest in the baby that Julia worried that having a child might be a mistake. Then, shortly after Lucy was born, Julia's mood plunged. She felt anxious and weepy, overwhelmed by Lucy's needs, and angry at loss of control over her own schedule. When Julia approached Kyle about her own fatigue and his unwillingness to help with the baby, he snapped that she was overreacting. Julia's childless friends stopped by just once to see Lucy but did not call again.

Julia's depressed mood quickly affected her baby. In the weeks after birth, infants of depressed mothers sleep poorly, are less attentive to their surroundings, and have elevated levels of the stress hormone cortisol (Field, 1998). The more extreme the depression and the greater the number of stressors in a mother's life (such as marital discord, little or no social support, and poverty), the more the parent-child relationship suffers (Simpson et al., 2003). Julia rarely smiled at, comforted, or talked to Lucy, who responded to her mother's sad, vacant gaze by turning away, crying, and often looking sad or angry herself (Feldman et al., 2009; Field, 2011). Julia, in turn, felt guilty and inadequate, and her depression deepened. By age 6 months, Lucy showed symptoms common in babies of depressed mothers—delays in motor and mental development, an irritable mood, and attachment difficulties (Cornish et al., 2005; McMahon et al., 2006).

When maternal depression persists, the parent-child relationship worsens. Depressed mothers view their infants and children more negatively than independent observers do (Forman et al., 2007). And they use inconsistent discipline—sometimes lax, at other times too forceful. As we will see in later chapters, children who experience these maladaptive parenting practices often have serious adjustment problems. Some withdraw into a depressed mood themselves; others become impulsive and aggressive (Hay et al., 2003). In one study, infants born to mothers who were depressed during pregnancy were four times as likely as babies of nondepressed mothers to have engaged in violent antisocial behavior (such as fighting, bullying, assault with a weapon, and extreme bodily harm) by age 16, after other stressors in the mother's life that could contribute to youth antisocial conduct had been controlled (Hay et al., 2010).

Paternal Depression

Paternal depression is also linked to dissatisfaction with marriage and family life after childbirth and to other life stressors, including job loss and divorce (Bielawska-Batorowicz & Kossakowska-Petrycka, 2006). In a study of a large representative sample of British parents and babies, researchers assessed depressive symptoms of fathers shortly after birth and again the following year. Then they tracked the children's development into the preschool years. Persistent paternal depression was, like maternal depression, a strong predictor of child behavior problems—especially overactivity, defiance, and aggression in boys (Ramchandani et al., 2008).

Paternal depression is linked to frequent father-child conflict as children grow older (Kane & Garber, 2004). Over time, children subjected to parental negativity develop a

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This depressed mother appears completely disengaged from her infant. In response, the baby is likely to become negative and irritable, to eventually withdraw, and to develop serious emotional and behavior problems.

pessimistic worldview—one in which they lack self-confidence and perceive their parents and other people as threatening. Children who constantly feel in danger are especially likely to become overly aroused in stressful situations, easily losing control in the face of cognitive and social challenges (Sturge-Apple et al., 2008). Although children of depressed parents may inherit a tendency to develop emotional and behavior problems, quality of parenting is a major factor in their adjustment.

Interventions

Early treatment is vital to prevent parental depression from interfering with the parent-child relationship. Julia's doctor referred her to a therapist, who helped Julia and Kyle with their marital problems. At times, antidepressant medication is prescribed.

In addition to alleviating parental depression, therapy that encourages depressed mothers to revise their negative views of their babies and to engage in emotionally positive, responsive caregiving is vital for reducing young children's attachment and other developmental problems (Forman et al., 2007). When a depressed parent does not respond easily to treatment, a warm relationship with the other parent or another caregiver can safeguard children's development (Mezulis, Hyde, & Clark, 2004).

Other Features of the Functionalist Approach

In addition to the vital role of emotions in cognitive, social, and physical development, functionalist theorists point out that emotions contribute to the emergence of self-awareness. For example, the interest and excitement that babies display when acting on novel objects help them forge a *sense of self-efficacy*—confidence in their own ability to control events in their surroundings (Harter, 2006). By the middle of the second year, when self-awareness is sufficiently developed, children begin to experience a new array of emotions with distinct functions. Recall Brenda's expressions of pride and embarrassment—two *self-conscious emotions* that have to do with evaluating the self's goodness or badness in relation to standards for morality, social behavior, and task mastery (Saarni et al., 2006).

Finally, the functionalist approach emphasizes that to adapt to their physical and social worlds, children must gain control over their emotions, just as they do their motor, cognitive, and social behavior. As part of this increasing *emotional self-regulation*, children must master their culture's rules for when and how to convey emotion. As a result, by late childhood, few emotions are expressed as openly and freely as they were in the early years of life. With these ideas in mind, let's chart the course of emotional development.

ASK YOURSELF

Review ■ Using research findings, provide an example of the impact of emotions on children's (1) cognitive processing, (2) social behavior, and (3) physical health.

Connect ■ Does the still-face reaction help us understand infants' responses to parental depressed mood, reviewed in the Biology and Environment box on page 402? Explain.

Apply ■ Recently divorced, Jeannine—mother of 3-month-old Jacob—feels lonely, depressed, and anxious about finances. How might Jeannine's emotional state affect Jacob's emotional and social adjustment? What can be done to help Jeannine and Jacob?

Reflect ■ Using one of your own experiences, illustrate the bidirectional relationship between emotion and cognition.

Development of Emotional Expression

Because infants cannot describe their feelings, determining exactly which emotions they are experiencing is a challenge. Although vocalizations and body movements provide some information, researchers have relied most on facial expressions. Cross-cultural evidence reveals that people around the world associate photographs of different facial expressions with emotions in the same way (Ekman, 2003; Ekman & Friesen, 1972). These findings inspired researchers to analyze infants' facial patterns carefully to determine the range of emotions they display at different ages.

Nevertheless, assuming a close correspondence between a pattern of behavior and an underlying emotional state can lead to error. Infants, children, and adults use diverse responses to express a particular emotion. For example, babies on the visual cliff (see page 159 in Chapter 4) generally do not display a fearful facial expression, though they do show other signs of fear—drawing back and refusing to crawl over the deep side. Recall, also, from Chapter 4 that the emotional expressions of blind babies, who cannot make eye contact, are muted, prompting parents to withdraw (see page 162). When therapists show parents how blind infants express emotions through finger movements, parents become more interactive (Fraiberg, 1971; Saarni et al., 2006). Furthermore, the same general response can express several emotions. Depending on the situation, a smile might convey joy, embarrassment, contempt, or a social greeting.

In line with the *dynamic systems perspective* (see page 30 in Chapter 1), emotional expressions vary with the person's developing capacities, goals, and context (Lewis, 2000, 2008). To

- How does the expression of basic emotions change during infancy?
- Describe the development of self-conscious emotions, emotional self-regulation, and conformity to emotional display rules.

infer babies' emotions more accurately, researchers must attend to multiple interacting expressive cues—vocal, facial, and gestural—and see how they differ across situations believed to elicit different emotions.

Basic Emotions

Basic emotions—happiness, interest, surprise, fear, anger, sadness, disgust—are universal in humans and other primates and have a long evolutionary history of promoting survival. Do infants come into the world with the ability to express basic emotions? Although signs of some emotions are present, babies' earliest emotional life consists of little more than two global arousal states: attraction to pleasant stimulation and withdrawal from unpleasant stimulation (Camras et al., 2003; Fox, 1991). Only gradually do emotions become clear, well-organized signals.

The dynamic systems perspective helps us understand how this happens: Children coordinate separate skills into more effective, emotionally expressive systems as the central nervous system develops and the child's goals and experiences change (Camras & Shutter, 2010). Videotaping the facial expressions of her daughter from 6 to 14 weeks, Linda Camras (1992) found that in the early weeks, the baby displayed a fleeting angry face as she was about to cry and a sad face as her crying waned. These expressions first appeared on the way to or away from full-blown distress and were not clearly linked to the baby's experiences and desires. With age, she was better able to sustain an angry signal when she encountered a blocked goal and a sad signal when she could not overcome an obstacle.

According to one view, sensitive, contingent caregiver communication, in which parents selectively mirror aspects of the baby's diffuse emotional behavior, helps infants construct emotional expressions that more closely resemble those of adults (Gergely & Watson, 1999). With age, face, gaze, voice, and posture start to form organized patterns that vary meaningfully with environmental events. For example, by the middle of the first year, babies typically respond to the parent's playful interaction with a joyful face, pleasant babbling, and a relaxed posture, as if to say, "This is fun!" In contrast, an unresponsive parent often evokes a sad face, fussy sounds, and a drooping body (sending the message, "I'm despondent") or an angry face, crying, and "pick me up" gestures (as if to say, "Change this unpleasant event!") (Weinberg & Tronick, 1994; Yale et al., 1999). Gradually, emotional expressions become well-organized and specific—and therefore provide more precise information about the baby's internal state.

Four basic emotions—happiness, anger, sadness, and fear—have received the most research attention. Let's see how they develop.



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A baby's joyous laughter encourages his mother to respond in kind, binding them together in a warm, affectionate relationship that promotes all aspects of development.

Happiness Happiness—expressed first in blissful smiles, later through exuberant laughter—contributes to many aspects of development. When infants achieve new skills, they smile and laugh, displaying delight in motor and cognitive mastery. As the smile encourages caregivers to be affectionate and stimulating, the baby smiles even more (Aksan & Kochanska, 2004). Happiness binds parent and child into a warm, supportive relationship that fosters the infant's developing competencies.

During the early weeks, newborn babies smile when full, during REM sleep, and in response to gentle touches and sounds, such as stroking of the skin, rocking, and the mother's soft, high-pitched voice. By the end of the first month, infants smile at dynamic, eye-catching sights, such as a bright object jumping suddenly across their field of vision. And as infants attend to the parent's face, and the parent talks and smiles, babies knit their brows, open their mouths to coo, and move their arms and legs excitedly, gradually becoming more emotionally positive until, between 6 and 10 weeks, the parent's communication evokes a broad grin called the **social smile** (Lavelli & Fogel, 2005; Sroufe & Waters, 1976). These changes parallel the development of infant perceptual capacities—in particular, babies' sensitivity to visual patterns, including the human face (see Chapter 4). And social

smiling becomes better organized and stable as babies learn to use it to evoke and sustain pleasurable face-to-face interaction.

Laughter, which appears around 3 to 4 months, reflects faster processing of information than smiling. But as with smiling, the first laughs occur in response to very active stimuli, such as the parent saying playfully, “I’m gonna get you!” and kissing the baby’s tummy. As infants understand more about their world, they laugh at events with subtler elements of surprise, such as a silent game of peekaboo (Sroufe & Wunsch, 1972).

Around the middle of the first year, infants smile and laugh more when interacting with familiar people, a preference that strengthens the parent–child bond. Between 8 and 10 months, infants more often interrupt their play with an interesting toy to relay their delight to an attentive adult (Venezia et al., 2004). And like adults, 10- to 12-month-olds have several smiles, which vary with context—a broad, “cheek-raised” smile in response to a parent’s greeting; a reserved, muted smile for a friendly stranger; and a “mouth-open” smile during stimulating play (Bolzani et al., 2002; Messinger & Fogel, 2007). By the end of the first year, the smile has become a deliberate social signal.

Anger and Sadness Newborn babies respond with generalized distress to a variety of unpleasant experiences, including hunger, painful medical procedures, changes in body temperature, and too much or too little stimulation (see Chapter 4). From 4 to 6 months into the second year, angry expressions increase in frequency and intensity (Braungart-Rieker, Hill-Soderlund, & Karrass, 2010). Older infants also react with anger in a wider range of situations—when an interesting object or event is removed, an expected pleasant event does not occur, their arms are restrained, the caregiver leaves for a brief time, or they are put down for a nap (Camras et al., 1992; Stenberg & Campos, 1990; Sullivan & Lewis, 2003).

Why do angry reactions increase with age? As infants become capable of intentional behavior (see Chapter 6), they want to control their own actions and the effects they produce and will purposefully try to change an undesirable situation (Alessandri, Sullivan, & Lewis, 1990). They are also more persistent about obtaining desired objects and less easily distracted from those goals (Mascolo & Fischer, 2007). Furthermore, older infants are better at identifying who caused them pain or removed a toy. Their anger is particularly intense when a caregiver from whom they have come to expect warm behavior causes discomfort. The rise in anger is also adaptive. New motor capacities enable angry infants to defend themselves or overcome obstacles (Izard & Ackerman, 2000). Finally, anger motivates caregivers to relieve a baby’s distress and, in the case of separation, may discourage them from leaving again soon.

Although expressions of sadness also occur in response to pain, removal of an object, and brief separations, they are less common than anger (Alessandri, Sullivan, & Lewis, 1990). In contrast, sadness occurs often when infants are deprived of a familiar, loving caregiver or when caregiver–infant communication is seriously disrupted (refer again to the Biology and Environment box on page 402).

Fear Like anger, fear rises during the second half of the first year into the second year (Braungart-Rieker, Hill-Soderlund, & Karrass, 2010). Older infants hesitate before playing with a new toy, and newly crawling infants soon back away from heights (see Chapter 4). But the most frequent expression of fear is to unfamiliar adults, a response called **stranger anxiety**. Many infants and toddlers are quite wary of strangers, although the reaction does not always occur. It depends on several factors: temperament (some babies are generally more fearful), past experiences with strangers, and the current situation. When an unfamiliar adult picks up the infant in a new setting, stranger anxiety is likely. But if the adult sits still while the baby moves around and a parent remains nearby, infants often show positive and curious behavior (Horner, 1980). The stranger’s style of interaction—expressing warmth, holding out an attractive toy, playing a familiar game, and approaching slowly rather than abruptly—reduces the baby’s fear.



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This 8-month-old knows just what object she wants and who is keeping it from her. Angry reactions increase as babies become capable of intentional behavior and better able to identify obstacles to reaching their goals.

LOOK and LISTEN

While observing an 8- to 18-month-old with his or her parent, gently approach the baby, offering a toy. Does the baby respond with stranger anxiety? To better understand the baby’s behavior, ask the parent to describe his or her temperament and past experiences with strangers.



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Stranger anxiety appears in many infants after 6 months. But this baby, safe in his father's arms, also expresses curiosity, reaching out warily toward an unfamiliar adult who eases his fear by smiling and approaching slowly.

Cross-cultural research reveals that infant-rearing practices can modify stranger anxiety. Among the Efe hunters and gatherers of the Republic of Congo, where the maternal death rate is high, infant survival is safeguarded by a collective caregiving system in which, starting at birth, Efe babies are passed from one adult to another. Consequently, Efe infants show little stranger anxiety (Tronick, Morelli, & Ivey, 1992). In contrast, among infants in Israeli kibbutzim (cooperative agricultural settlements), who live in isolated communities vulnerable to terrorist attacks, wariness of strangers is widespread. By the end of the first year, when infants look to others for cues about how to respond emotionally, kibbutz babies display far greater stranger anxiety than their city-reared counterparts (Saarni et al., 2006).

The rise in fear after age 6 months keeps newly mobile babies' enthusiasm for exploration in check. Once wariness develops, infants use the familiar caregiver as a **secure base**, or point from which to explore, venturing into the environment and then returning for emotional support. As part of this adaptive system, encounters with strangers lead to two conflicting tendencies: approach (indicated by interest and friendliness) and avoidance (indicated by fear). The infant's behavior is a balance between the two.

Eventually, as cognitive development permits toddlers to discriminate more effectively between threatening and nonthreatening people and situations, stranger anxiety and other fears of the first two years decline. This change is adaptive because adults other than caregivers will soon be important in children's development. Fear also wanes as children acquire a wider array of strategies for coping with it, as you will see when we discuss emotional self-regulation.

Self-Conscious Emotions

Besides basic emotions, humans are capable of a second, higher-order set of feelings, including guilt, shame, embarrassment, envy, and pride. These are called **self-conscious emotions** because each involves injury to or enhancement of our sense of self. We feel guilt when we know that we have harmed someone and we want to correct the wrongdoing. When we are ashamed or embarrassed, we have negative feelings about our behavior, and we want to retreat so others will no longer notice our failings. In contrast, pride reflects delight in the self's achievements, and we are inclined to tell others what we have accomplished and to take on further challenges (Saarni et al., 2006).

Self-conscious emotions appear in the middle of the second year, as 18- to 24-month-olds become firmly aware of the self as a separate, unique individual. Toddlers show shame and embarrassment by lowering their eyes, hanging their heads, and hiding their faces with their hands. They show guiltlike reactions, too, like the 22-month-old who returned a toy she had grabbed and patted her upset playmate. Pride also emerges around this time, and envy by age 3 (Barrett, 2005; Garner, 2003; Lewis et al., 1989).

Besides self-awareness, self-conscious emotions require an additional ingredient: adult instruction in *when* to feel proud, ashamed, or guilty. The situations in which adults encourage self-conscious emotions vary from culture to culture. In Western individualistic nations, most children are taught to feel pride over personal achievement—throwing a ball the farthest, winning a game, and (later on) getting good grades. In collectivist cultures such as China and Japan, calling attention to purely personal success evokes embarrassment and self-effacement. And violating cultural standards by failing to show concern for others—a parent, a teacher, or an employer—sparks intense shame (Akimoto & Sanbonmatsu, 1999; Lewis, 1992).

As their self-concepts develop, children become increasingly sensitive to praise and blame or to the possibility of such feedback from parents, teachers, and other adults who matter to them, often viewing their expectations as obligatory rules ("Dad said you're 'posed to take turns'"). By age 3, self-conscious emotions are clearly linked to self-evaluation (Lewis,

1995; Thompson, Meyer, & McGinley, 2006). Preschoolers show much more pride when they succeed in difficult rather than easy tasks and much more shame when they fail simple rather than hard tasks (Lewis, Alessandri, & Sullivan, 1992).

Quality of adult feedback influences these early self-evaluative reactions. When parents repeatedly comment on the worth of the child and her performance (“That’s a bad job!” “I thought you were a good girl”), children experience self-conscious emotions intensely—more shame after failure, more pride after success. In contrast, when parents focus on how to improve performance (“You did it this way; now try doing it that way”), they induce moderate, more adaptive levels of shame and pride and greater persistence on difficult tasks (Kelley, Brownell, & Campbell, 2000; Lewis, 1998).

Among Western children, intense shame is associated with feelings of personal inadequacy (“I’m stupid”; “I’m a terrible person”) and with maladjustment—withdrawal and depression as well as intense anger and aggression toward those who participated in the shame-evoking situation (Lindsay-Hartz, de Rivera, & Mascolo, 1995; Mills, 2005). In contrast, guilt—when it occurs in appropriate circumstances and is neither excessive nor accompanied by shame—is related to good adjustment. Guilt helps children resist harmful impulses, and it motivates a misbehaving child to repair the damage and behave more considerately (Mascolo & Fischer, 2007; Tangney, Stuewig, & Mashek, 2007). But overwhelming guilt—involving such high emotional distress that the child cannot make amends—is linked to depressive symptoms as early as age 3 (Luby et al., 2009).

The consequences of shame for children’s adjustment, however, may vary across cultures. In Asian collectivist societies, where people define themselves in relation to their social group, shame is viewed as an adaptive reminder of the importance of others’ judgments (Bedford, 2004). Chinese parents, for example, believe that it is important for a misbehaving child to feel ashamed. As early as age 2½, they frequently use shame to teach right from wrong, while mindful that excessive shaming could harm the child’s self-esteem (Fung, 1999). Not surprisingly, Chinese children add the word *shame* to their vocabularies by age 3, much earlier than their American counterparts do (Shaver, Wu, & Schwartz, 1992).

As children develop inner standards of excellence and good behavior and a sense of personal responsibility, the circumstances under which they experience self-conscious emotions change. Unlike preschoolers, school-age children experience pride in a new accomplishment and guilt over a transgression even when no adult is present (Harter & Whitesell, 1989). Also, school-age children no longer report guilt for any mishap, as they did earlier, but only for intentional wrongdoing, such as ignoring responsibilities, cheating, or lying (Ferguson, Stegge, & Damhuis, 1991). These changes reflect the older child’s more mature sense of morality, a topic we will take up in Chapter 12.



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A teacher’s praise reinforces this 6-year-old’s pride in completing a sheet of challenging math problems. But even when no adult is present, school-age children experience pride, guilt, and other self-conscious emotions.

Emotional Self-Regulation

Besides expressing a wider range of emotions, children learn to manage their emotional experiences. **Emotional self-regulation** refers to the strategies we use to adjust our emotional state to a comfortable level of intensity so we can accomplish our goals. It requires several cognitive capacities that we discussed in Chapter 7—attention focusing and shifting, the ability to inhibit thoughts and behavior, and planning, or actively taking steps to relieve a stressful situation (Eisenberg & Spinrad, 2004; Thompson & Goodvin, 2007). When you remind yourself that an anxiety-provoking event will be over soon, suppress your anger at a friend’s behavior, or decide not to see a scary horror film, you are engaging in emotional self-regulation.

Emotional self-regulation requires voluntary, effortful management of emotions. This capacity for *effortful control* improves gradually, as the result of development of the prefrontal cortex and the assistance of caregivers, who help children manage intense emotion and

teach them strategies for doing so (Fox & Calkins, 2003; Rothbart, Posner, & Kieras, 2006). Individual differences in control of emotion are evident in infancy and, by early childhood, play such a vital role in children's adjustment that—as we will see later—effortful control is considered a major dimension of temperament. Let's turn now to changes in emotional self-regulation from infancy to adolescence.

Infancy In the early months, infants have only a limited capacity to regulate their emotional states. When their feelings get too intense, they are easily overwhelmed. They depend on the soothing interventions of caregivers—being lifted to the shoulder, rocked, gently stroked, and talked to softly—for distraction and reorienting of attention.

More effective functioning of the prefrontal cortex increases the baby's tolerance for stimulation. Between 2 and 4 months, caregivers build on this capacity by initiating face-to-face play and attention to objects. In these interactions, parents arouse pleasure in the baby while adjusting the pace of their own behavior so the infant does not become overwhelmed and distressed. As a result, the baby's tolerance for stimulation increases further (Kopp & Neufeld, 2003).

By 4 to 6 months, the ability to shift attention and engage in self-soothing helps infants control emotion. Babies who more readily turn away from highly stimulating novel events (a toy fire truck with siren blaring and lights flashing) or engage in self-soothing are less prone to distress (Crockenberg & Leerkes, 2003a). At the end of the first year, crawling and walking enable infants to regulate emotion more effectively by approaching or retreating from various situations. And further gains in attention permit toddlers to sustain interest in their surroundings and in play activities for a longer time (Rothbart & Bates, 2006).

Infants whose parents “read” and respond contingently and sympathetically to their emotional cues tend to be less fussy and fearful, to express more pleasurable emotion, to be more interested in exploration, and to be easier to soothe (Braungart-Rieker, Hill-Soderlund, & Karrass, 2010; Crockenberg & Leerkes, 2004; Volling et al., 2002). In contrast, parents who respond impatiently or angrily or who wait to intervene until the infant has become extremely agitated reinforce the baby's rapid rise to intense distress. This makes it harder for parents to soothe the baby in the future—and for the baby to learn to calm herself. When caregivers fail to regulate stressful experiences for infants who cannot yet regulate them for themselves, brain structures that buffer stress may fail to develop properly, resulting in an

anxious, emotionally reactive child who has a reduced capacity for managing emotional problems (Feldman, 2007; Little & Carter, 2005).

In the second year, gains in representation and language lead to new ways of regulating emotion. A vocabulary for talking about feelings—“happy,” “love,” “surprised,” “scary,” “yucky,” “mad”—develops rapidly after 18 months, but toddlers are not yet good at using language to manage their emotions. Temper tantrums tend to occur because toddlers cannot control the intense anger that often arises when an adult rejects their demands, particularly when they are fatigued or hungry (Mascolo & Fischer, 2007). Toddlers whose parents are emotionally sympathetic but set limits (by not giving in to tantrums), who distract the child by offering acceptable alternatives to the prohibited activity, and who later suggest better ways to handle adult refusals display more effective anger-regulation strategies and social skills during the preschool years (Lecuyer & Houck, 2006).

Patient, sensitive parents also encourage toddlers to describe their internal states. Then, when 2-year-olds feel distressed, they can guide caregivers in helping them. For example, while listening to a story about monsters, one 22-month-old whimpered, “Mommy, scary.” Her mother put down the book and gave her a consoling hug.

Early Childhood After age 2, children frequently talk about feelings, and language becomes a major means of actively trying to control them (Cole, Armstrong, & Pemberton, 2010). By age 3 to 4, preschoolers verbalize a variety of emotional self-regulation strategies. For example, they know they can

Through adult–child conversations that prepare children for difficult experiences, preschoolers learn techniques for regulating emotions. With her mother's reassurance, a 3-year-old is ready for the daily transition to preschool.



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APPLYING WHAT WE KNOW

Helping Children Manage Common Fears of Early Childhood

FEAR	SUGGESTION
Monsters, ghosts, and darkness	Reduce exposure to frightening stories in books and on TV until the child is better able to distinguish between appearance and reality. Make a thorough “search” of the child’s room for monsters, showing him that none are there. Leave a night-light burning, sit by the child’s bed until he falls asleep, and tuck in a favorite toy for protection.
Preschool or child care	If the child resists going to preschool but seems content once there, the fear is probably separation. Provide a sense of warmth and caring while gently encouraging independence. If the child fears being at preschool, find out what is frightening—the teacher, the children, or a crowded, noisy environment. Provide extra support by accompanying the child and gradually lessening the amount of time you are present.
Animals	Do not force the child to approach a dog, cat, or other animal that arouses fear. Let the child move at her own pace. Demonstrate how to hold and pet the animal, showing the child that when treated gently, the animal is friendly. If the child is larger than the animal, emphasize this: “You’re so big. That kitty is probably afraid of <i>you!</i> ”
Intense fears	If a child’s fear is intense, persists for a long time, interferes with daily activities, and cannot be reduced in any of the ways just suggested, it has reached the level of a <i>phobia</i> . Sometimes phobias are linked to family problems, and counseling is needed to reduce them. At other times, phobias diminish without treatment as the child’s capacity for emotional self-regulation improves.

blunt emotions by restricting sensory input (covering their eyes or ears to block out an unpleasant sight or sound), talking to themselves (“Mommy said she’ll be back soon”), or changing their goals (deciding that they don’t want to play anyway after being excluded from a game). Children’s use of these strategies means fewer emotional outbursts over the preschool years (Thompson & Goodvin, 2007). As the examples suggest, shifting attention away from sources of frustration continues to be an effective approach to managing emotion. Three-year-olds who can distract themselves when frustrated tend to become cooperative school-age children with few problem behaviors (Gilliom et al., 2002).

By watching adults handle their own feelings and respond to those of others, preschoolers pick up strategies for regulating emotion. Warm, patient parents who use verbal guidance, including suggesting and explaining strategies and prompting children to generate their own, strengthen children’s capacity to handle stress (Colman et al., 2006; Morris et al., 2011). Such children are more likely to use private speech (verbal self-guidance) to regulate emotion (Atencio & Montero, 2009). In contrast, when parents rarely express positive emotion, dismiss children’s feelings as unimportant, and have difficulty controlling their own anger, children have continuing problems in managing emotion that seriously interfere with psychological adjustment (Hill et al., 2006; Katz & Windecker-Nelson, 2004; Thompson & Meyer, 2007).

As with infants and toddlers, preschoolers who experience negative emotion intensely have greater difficulty shifting their attention away from disturbing events and inhibiting their feelings. They are more likely to be anxious and fearful, respond with irritation to others’ distress, react angrily or aggressively when frustrated, and get along poorly with teachers and peers (Chang et al., 2003; Eisenberg et al., 2005; Raikes et al., 2007). Because these emotionally reactive children become increasingly difficult to rear, they are often targets of ineffective parenting, which compounds their poor self-regulation.

Adult–child conversations that prepare children for difficult experiences also foster emotional self-regulation (Thompson & Goodman, 2010). Parents who discuss what to expect and ways to handle anxiety offer techniques that children can apply. Nevertheless, preschoolers’ vivid imaginations and incomplete grasp of the distinction between appearance and reality make fears common in early childhood. Consult Applying What We Know above for ways adults can help young children manage fears.

Middle Childhood and Adolescence Rapid gains in emotional self-regulation occur after school entry, as emotion regulation strategies become more varied, sophisticated, and flexible (Raffaelli, Crockett, & Shen, 2005). Between ages 6 and 8—as they become aware of the difference between feeling an emotion and expressing it—children increasingly reserve the full performance of emotional expressions for communicating with others. When alone—although they report experiencing emotions just as intensely—they abbreviate their emotional expressions, representing them internally, just as they internalize their private speech (see Chapter 6) (Holodynski, 2004). This emergence of a *mental level* of emotional self-communication helps children reflect on their emotions and, therefore, manage them.

At the same time, school-age children face new challenges in regulating negative emotion, prompted by their developing sense of self-worth and expanding knowledge of the wider world. Common fears of the school years include poor academic performance, rejection by classmates, the possibility of personal harm (being robbed or shot), threats to parental health, and media events (wars and disasters) (Gullone, 2000; Weems & Costa, 2005). School-age children's fears are shaped in part by their culture. For example, in China, where self-restraint and compliance with social standards are highly valued, more children mention failure and adult criticism as salient fears than in Australia or the United States. Chinese children, however, are not more fearful overall (Ollendick et al., 1996). The number and intensity of fears they report resemble those of Western children.

By age 10, most children shift adaptively between two general strategies for managing emotion. In **problem-centered coping**, they appraise the situation as changeable, identify the difficulty, and decide what to do about it. If problem solving does not work, they engage in **emotion-centered coping**, which is internal, private, and aimed at controlling distress when little can be done about an outcome (Kliewer, Fearnow, & Miller, 1996; Lazarus & Lazarus, 1994). For example, when faced with an anxiety-provoking test or a friend who is angry at them, older school-age children view problem solving and seeking social support as the best strategies. But when outcomes are beyond their control—for example, after receiving a bad grade—they opt for distraction or try to redefine the situation in ways that help them accept it: “Things could be worse. There’ll be another test.” School-age children’s improved ability to appraise situations and reflect on thoughts and feelings means that, compared with preschoolers, they more often use these internal strategies to manage emotion (Brenner & Salovey, 1997).

Cognitive development, including gains in planning and inhibition, and a wider range of social experiences contribute to flexible, effective coping strategies. When emotional self-regulation has developed well, young people acquire a sense of *emotional self-efficacy*—a feeling of being in control of their emotional experience (Saarni, 2000; Thompson & Goodwin, 2010). This fosters a favorable self-image and an optimistic outlook, which help them face further emotional challenges.

LOOK and LISTEN

Ask several school-age children and adolescents how they would manage their emotions in the following situations: (1) a friend is angry with them, and (2) they receive a bad grade on an important test. Do their responses reflect flexible, adaptive coping?

Acquiring Emotional Display Rules

In addition to regulating internal emotional states, children must learn to control what they communicate to others. Young preschoolers have some ability to modify their expressive behavior. For example, when denied a cookie before dinnertime, one 2-year-old paused, picked up her blanket, and walked from the hard kitchen floor to the soft family-room carpet where she could comfortably throw herself down and howl loudly!

At first, children modify emotional expressions to serve personal needs, and they exaggerate their true feelings (as this child did to get attention and a cookie). Soon, they learn to restrain their expressive behavior and substitute other reactions, such as smiling when feeling anxious or disappointed. All societies have **emotional display rules** that specify when, where, and how it is appropriate to express emotions.

As early as the first few months, parents encourage infants to suppress negative emotion by often imitating their expressions of interest, happiness, and surprise and rarely imitating their expressions of anger and sadness. Baby boys get more of this training than girls, in part because boys have a harder time regulating negative emotion (Else-Quest et al., 2006;

Malatesta et al., 1986). As a result, the well-known sex difference—females as emotionally expressive and males as emotionally controlled—is promoted at a tender age. Perhaps because of greater social pressure to suppress emotion, school-age boys are less accurate than girls in describing their emotions. In a Canadian study, after watching an emotionally arousing video, boys were less likely than girls to report feelings that matched their facial expressions (Strayer & Roberts, 1997). This disconnect between boys' public messages (facial expressions) and verbal acknowledgment of feelings probably contributes to the gender difference in intimacy of close relationships, which we examine in Chapter 13.

Although caregiver shaping of emotional behavior begins early, children only gradually gain the ability to conform to display rules. By age 3, capacity for self-regulation predicts children's skill at portraying an emotion they do not feel—for example, reacting cheerfully after receiving an undesirable gift (Kieras et al., 2005). These emotional “masks” are largely limited to positive feelings of happiness and surprise. Children of all ages (like adults) find it harder to act angry, sad, or disgusted than pleased (Lewis, Sullivan, & Vasen, 1987). These trends reflect social pressures: To foster harmonious relationships, most cultures teach children to communicate positive feelings and inhibit unpleasant emotional displays.

Through interacting with parents, teachers, and peers, children learn how to express negative emotion in ways likely to evoke a desired response from others. School-age children increasingly prefer verbal strategies to crying, sulking, or aggression (Shipman et al., 2003). As these findings suggest, children gradually become consciously aware of display rules. Kindergartners typically say they obey the rules to avoid punishment and gain approval from others. By third grade, children understand the value of display rules in ensuring social harmony (Jones, Abbey, & Cumberland, 1998). School-age children who justify emotional display rules by referring to concern for others' feelings are rated as especially helpful, cooperative, and socially responsive by teachers and as better liked by peers (Garner, 1996; McDowell & Parke, 2000).

Collectivist cultures place particular emphasis on emotional display rules, although they vary in how they teach children to inhibit negative displays. In a striking illustration, researchers studied children in two collectivist subcultures in rural Nepal. In response to stories about emotionally charged situations (such as peer aggression or an unjust parental punishment), Hindu children more often said they would feel angry but would try to mask their feelings. Buddhist children, in contrast, interpreted the situation so that they felt “just OK” rather than angry. “Why be angry?” they explained. “The event already happened” (see Figure 10.1). In line with this difference, Hindu mothers reported that they often teach their children how to control their emotional behavior; whereas Buddhist mothers pointed to the value their religion places on a calm, peaceful disposition (Cole & Tamang, 1998; Cole, Tamang, & Shrestha, 2006). Compared to both Nepalese groups, U.S. children preferred conveying their anger verbally in these situations; for example, to an unjust punishment, they answered, “If I say I'm angry, he'll stop hurting me!” (Cole, Bruschi, & Tamang, 2002). Notice how this response fits with the Western individualistic emphasis on personal rights and self-expression.

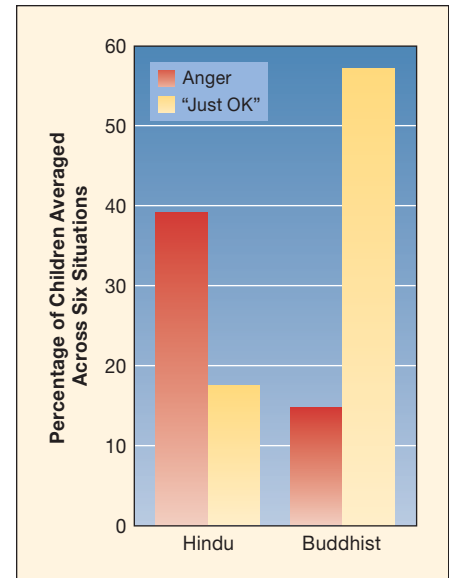


FIGURE 10.1 Hindu and Buddhist children's reports of feeling anger and “just OK” in response to emotionally charged situations. Hindu children reported that they would feel more anger. Buddhist children, whose religion values a calm, peaceful disposition, more often stated that they would feel “just OK.” The children sometimes selected other emotions, such as “happy,” “sad,” or “scared,” but these did not differ between the two subcultures and are not shown. (Adapted from Cole & Tamang, 1998.)

ASK YOURSELF

Review ■ Why do many infants show stranger anxiety in the second half of the first year? What factors can increase or decrease wariness of strangers?

Connect ■ Why do children of depressed parents have difficulty regulating emotion (see page 402)? What implications do their weak self-regulatory skills have for their response to cognitive and social challenges?

Apply ■ At age 14 months, Reggie built a block tower and gleefully knocked it down. But at age 2, he called to his mother and pointed proudly to his tall block tower. What explains this change in Reggie's emotional behavior?

Reflect ■ How do you typically manage negative emotion? Describe several recent examples. How might your early experiences, gender, and cultural background have influenced your style of emotional self-regulation?

- ▶ Describe the development of emotional understanding from infancy through middle childhood.
- ▶ Describe the development of empathy from infancy into adolescence, noting individual differences.

Understanding and Responding to the Emotions of Others

Children's emotional expressiveness is intimately tied to their ability to interpret the emotional cues of others. We have seen that in the first few months, infants match the feeling tone of the caregiver in face-to-face communication. Some researchers claim that young babies respond in kind to others' emotions through a built-in, automatic process of *emotional contagion* (Stern, 1985). Others, however, believe that infants acquire these emotional contingencies through operant conditioning—for example, learning that a smile generally triggers caregiver responsiveness and that distress prompts a comforting response (Saarni et al., 2006).

Around 3 to 4 months, infants can match the emotion in a voice with the appropriate face of a speaking person, and they become sensitive to the structure and timing of face-to-face interactions. When they gaze, smile, or vocalize, they now expect their social partner to respond in kind, and they reply with positive vocal and emotional reactions (Markova & Legerstee, 2006; Rochat, Striano, & Blatt, 2002). Within these exchanges, babies become increasingly aware of the range of emotional expressions (Montague & Walker-Andrews, 2001). Recall from Chapter 4 (see page 146) that out of this early imitative communication, infants start to view others as “like me”—an awareness believed to lay the foundation for understanding others' thoughts and feelings (Meltzoff, 2007).

From 5 months on, infants perceive facial expressions as organized patterns, and they can match the emotion in a voice with the appropriate face of a speaking person (see Chapter 4). Responding to emotional expressions as organized wholes suggests that these signals are becoming meaningful to babies. Between 7 and 12 months, ERPs recorded while infants attend to facial expressions reveal reorganized brain-wave patterns resembling those of adults, suggesting enhanced processing of emotional cues (Grossmann, Striano, & Friederici, 2007).

As skill at establishing joint attention improves, infants realize that an emotional expression not only has meaning but is also a meaningful reaction to a specific object or event (Moses et al., 2001; Tomasello, 1999). Once these understandings are in place, infants actively seek emotional information from trusted caregivers.

Social Referencing

Beginning at 8 to 10 months, when infants start to evaluate unfamiliar people, objects, and events in terms of their own safety and security, they often engage in **social referencing**—relying on another person's emotional reaction to appraise an uncertain situation (Mumme et al., 2007). Many studies show that a caregiver's emotional expression (happy, angry, or fearful) influences whether a 1-year-old will be wary of strangers, play with an unfamiliar toy, or cross the deep side of the visual cliff (de Rosnay et al., 2006; Stenberg, 2003; Striano & Rochat, 2000). The caregiver's voice—either alone or combined with a facial expression—is more effective than a facial expression alone (Kim, Walden, & Knieps, 2010; Vaish & Striano, 2004). The voice conveys both emotional and verbal information, and the baby need not turn toward the adult but, instead, can focus on evaluating the novel event.

As recall memory and language skills improve, and as parents' warnings to their newly walking youngsters become more frequent and intense, babies retain these emotional messages over longer time intervals. At 11 months, they respond appropriately after a delay of a few minutes, at 14 months after a delay of an hour or more (Hertenstein & Campos, 2004). By the middle of the second year, social referencing expands to include indirect emotional signals. After observing an adult react angrily to a second adult's play with a toy, 18-month-olds increased their monitoring of the angry adult's facial expression and reduced their touching of the object (Repacholi & Meltzoff, 2007).

As toddlers begin to appreciate that others' emotional reactions may differ from their own, social referencing allows them to compare their own and others' assessments of events. In one study, an adult showed 14- and 18-month-olds broccoli and crackers. In one condition, she acted delighted with the taste of broccoli but disgusted with the taste of crackers. In the other

LOOK and LISTEN

Observe a toddler and parent at a playground, park, or shopping mall, noting circumstances that trigger social referencing. How does the parent convey emotional information? How does the toddler respond?

condition, she showed the reverse preference. When asked to share the food, 14-month-olds offered only the type of food they themselves preferred—usually crackers. In contrast, 18-month-olds gave the adult whichever food she appeared to like, regardless of their own preferences (Repacholi & Gopnik, 1997).

In sum, in social referencing, toddlers move beyond simply reacting to others' emotional messages. They use those signals to evaluate the safety and security of their surroundings, to guide their own actions, and to gather information about others' intentions and preferences. These experiences, along with cognitive and language development, probably help toddlers refine the meanings of emotions of the same valence—for example, happiness versus surprise, anger versus fear—during the second year (Gendler, Witherington, & Edwards, 2008; Saarni et al., 2006).



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A toddler engages in social referencing, concluding from her father's calm, confident manner that it is safe to approach these unfamiliar animals.

Emotional Understanding in Childhood

During the preschool years, children's emotional understanding expands rapidly, as their everyday talk about emotions reveals:

Two-year-old: [After father shouted at child, she became angry, shouting back] I'm mad at you, Daddy. I'm going away. Goodbye.

Two-year-old: [Commenting on another child who refused to take a nap and cried] Mom, Annie cry. Annie sad.

Six-year-old: [In response to mother's comment, "It's hard to hear the baby crying"] Well, it's not as hard for me as it is for you. [When mother asked why] Well, you like Johnny better than I do! I like him a little, and you like him a lot, so I think it's harder for you to hear him cry.

Six-year-old: [Comforting a small boy in church whose mother had gone up to communion] She'll be right back. Don't be afraid. I'm here. (Bretherton et al., 1986, pp. 536, 540, 541)

Cognitive Development and Emotional Understanding As these examples show, early in the preschool years, children refer to causes, consequences, and behavioral signs of emotion, and over time their understanding becomes more accurate and complex (Stein & Levine, 1999). By age 4 to 5, they correctly judge the causes of many basic emotions ("He's happy because he's swinging very high"; "He's sad because he misses his mother"). Preschoolers' explanations tend to emphasize external factors over internal states, a balance that changes with age (Levine, 1995). In Chapter 11, we will see that after age 4, children appreciate that both desires and beliefs motivate behavior. Once these understandings are secure, children's grasp of how internal factors can trigger emotion expands.

Preschoolers can also predict what a playmate expressing a certain emotion might do next. Four-year-olds know that an angry child might hit someone and that a happy child is more likely to share (Russell, 1990). And they realize that thinking and feeling are interconnected—that a person reminded of a previous sad experience is likely to feel sad (Lagattuta, Wellman, & Flavell, 1997). Furthermore, they come up with effective ways to relieve others' negative feelings, such as hugging to reduce sadness (Fabes et al., 1988).

In middle childhood, ability to consider conflicting cues when explaining others' emotions improves. When asked what might be happening in a picture showing a happy-faced child with a broken bicycle, 4- and 5-year-olds tended to rely only on the emotional expression: "He's happy because he likes to ride his bike." By age 8 to 9, children more often reconciled the two cues: "He's happy because his father promised to help fix his broken bike" (Gnepp, 1983; Hoffner & Badzinski, 1989). Similarly, older children are more aware of circumstances likely to spark mixed emotions, each of which may be positive or negative and may differ in intensity (Larsen, To, & Fireman, 2007; Pons et al., 2003). Preschoolers, by contrast, staunchly deny that two emotions can occur at once, much as they do not integrate two variables (height and width) in a Piagetian conservation-of-liquid task (see Chapter 6).



The older of these siblings clearly realizes—even if his younger brother doesn't—that it is possible to experience two emotions at once: happiness at getting a Christmas gift but disappointment with the gift itself.

Appreciating mixed emotions helps school-age children realize that people's expressions may not reflect their true feelings (Misailidi, 2006; Saarni, 1999). It also fosters awareness of self-conscious emotions, which are more complex in expression than basic emotions. For example, between ages 6 and 7, children improve sharply in ability to distinguish pride from happiness and surprise (Tracy, Robins, & Lagattuta, 2005). And 8- and 9-year-olds understand that pride combines two sources of happiness—joy in accomplishment and joy that a significant person recognized that accomplishment (Harter, 1999). As with the development of *metacognition* (thinking about thought), discussed in Chapter 7, striking gains in thinking about emotion occur in middle childhood.

Social Experience and Emotional Understanding The more mothers label emotions, explain them, and express warmth and enthusiasm when conversing with preschoolers, the more “emotion words” children use and the better developed their emotional understanding (Fivush & Haden, 2005; Laible & Song, 2006). Maternal prompting of emotional thoughts (“What makes him afraid?”) is a good predictor of 2-year-olds’ emotion language. For older preschoolers, explanations (“He’s sad because his dog ran away”) are more important (Cervantes & Callanan, 1998). Does this remind you of the concept of *scaffolding*, discussed in Chapter 6—that to be effective, adult teaching must adjust to children’s increasing competence?

Preschoolers whose parents frequently acknowledge their emotional reactions and explicitly teach them about diverse emotions are better able to judge others’ emotions when tested at later ages (Denham & Kochanoff, 2002). Discussions in which family members disagree are particularly helpful. In one study, when mothers explained feelings and negotiated and compromised during conflicts with their 2½-year-olds, their children, at age 3, were advanced in understanding emotion and used similar strategies to resolve disagreements (Laible & Thompson, 2002). Such dialogues seem to help children reflect on the causes and consequences of emotion while modeling mature communication skills. Furthermore, 3- to 5-year-olds who have a warm, relaxed relationship with their mothers (a secure attachment bond) better understand emotion. Attachment security is related to warmer and more elaborative parent–child narratives, including discussions of feelings that highlight the emotional significance of events (Laible, 2004; Laible & Song, 2006; Raikes & Thompson, 2006).

As preschoolers learn more about emotion from interacting with adults, they engage in more emotion talk with siblings and friends, especially during make-believe play (Hughes & Dunn, 1998). Make-believe, in turn, contributes to emotional understanding, especially when children play with siblings (Youngblade & Dunn, 1995). The intense nature of the sibling relationship, combined with frequent acting out of feelings, makes pretending an excellent context for early learning about emotions. And when parents intervene in sibling disputes by reasoning and negotiating, preschoolers gain in sensitivity to their siblings’ feelings (Perlman & Ross, 1997). They more often refer to their siblings’ emotional perspective (“You get mad when I don’t share”) and engage in less fighting.

Knowledge about emotions helps children greatly in their efforts to get along with others. As early as 3 to 5 years of age, it is related to friendly, considerate behavior; willingness to make amends after harming another; and constructive responses to disputes with agemates (Dunn, Brown, & Maguire, 1995; Garner & Estep, 2001; Hughes & Ensor, 2010). Also, the more preschoolers refer to feelings when interacting with playmates, the better liked they are by their peers (Fabes et al., 2001). Children seem to recognize that acknowledging others’ emotions and explaining their own enhance the quality of relationships.

Empathy and Sympathy

In empathy, understanding and expression of emotions are interwoven, since both awareness of the emotions of another and the vicarious experience of those emotions are required for an empathic response. Current theorists agree that **empathy** involves a complex interaction

of cognition and affect: the ability to detect different emotions, to take another's emotional perspective, and to feel with that person, or respond emotionally in a similar way. Beginning in the preschool years, empathy is an important motivator of **prosocial, or altruistic, behavior**—actions that benefit another person without any expected reward for the self (Eisenberg, Fabes, & Spinrad, 2006; Spinrad & Eisenberg, 2009). Yet in some children, empathizing with an upset adult or peer does not yield acts of kindness and helpfulness but instead escalates into *personal distress*. In trying to reduce these feelings, the child focuses on his own anxiety rather than on the person in need. As a result, empathy does not lead to **sympathy**—feelings of concern or sorrow for another's plight.

Development of Empathy Empathy has roots early in development. Newborn babies tend to cry in response to the cry of another baby (see pages 135–136 in Chapter 4). And earlier we noted young infants' matching of others' emotional expressions. In sensitive, face-to-face communication, infants “connect” emotionally with their caregivers—experiences believed to be the foundation for empathy and concern for others (Zahn-Waxler, 1991).

Like self-conscious emotions, true empathy requires children to understand that the self is distinct from other people. As self-awareness strengthens at the end of the second year, toddlers begin to empathize. With age, they not only sense another's unhappiness but become better at inferring from the situation what might help relieve it (Svetlova, Nichols, & Brownell, 2010). For example, 2- to 2½-year-olds will readily hand a blanket to an adult who is rubbing her arms, shivering, and saying, “Brrrrr.” And they are likely to respond to their mother's simulated sadness by offering a hug or comforting words, or trying to distract her with a toy (Zahn-Waxler & Radke-Yarrow, 1990). Children of this age even react with concern and consoling behavior to an adult who experiences harm (someone destroys her treasured possession) but who shows no overt emotion (Vaish, Carpenter, & Tomasello, 2009). Older toddlers seem to be able to engage in basic *affective perspective-taking*—inferring how another feels by imagining themselves in that person's place.

As language develops, children rely more on words to console others, indicating a more reflective level of empathy (Bretherton et al., 1986). When a 4-year-old received a Christmas gift that she hadn't included on her list for Santa, she assumed it belonged to another little girl and pleaded with her parents, “We've got to give it back—Santa's made a big mistake. I think the girl's crying 'cause she didn't get her present!”

Empathy increases over the elementary school years as children understand a wider range of emotions and take multiple cues into account in assessing others' feelings (Ricard & Kamberk-Kilicci, 1995). During late childhood and adolescence, advances in perspective taking permit an empathic response not just to people's immediate distress but also to their general life condition (Hoffman, 2000). The ability to empathize with the poor, oppressed, and sick requires an advanced form of perspective taking in which the young person understands that people lead continuous emotional lives beyond the current situation.

Individual Differences Temperament plays a role in whether empathy occurs and whether it prompts sympathetic, prosocial behavior or a personally distressed, self-focused response. Twin studies reveal that empathy is moderately heritable (Knafo et al., 2009). Children who are sociable, assertive, and good at regulating emotion are more likely than poor emotion regulators to empathize with others' distress, display sympathetic concern, and engage in prosocial behavior, helping, sharing, and comforting others in distress (Bengtson, 2005; Eisenberg et al., 1998; Valiente et al., 2004). Such children are also more likely to empathize with others' positive emotions of joy and happiness (Sallquist et al., 2009).

In contrast, aggressive children's high hostility, weakened capacity to take another's perspective, and impulsive acting out of negative feelings blunt their capacity for empathy and sympathy. Many show a decline—rather than the typical rise—in concern for others during middle childhood (Hastings et al., 2000; Strayer & Roberts, 2004b). And shy children may not display sympathetic concern because they are easily overwhelmed by anxiety when others are distressed (Eisenberg et al., 1996).

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A preschooler comforts a sad classmate. As children's language and perspective-taking skills expand, empathy increases and, in children who are good at regulating emotion, leads to sympathetic concern and prosocial behavior.

Individual differences in empathy and sympathy are evident in children's facial and neurobiological responses. In a series of studies, children watched videotapes of people in need, such as two children lying on the ground crying. Children who reacted with facial or physiological markers of concern—an interested, caring expression or a decrease in heart rate, suggesting orienting and attention—usually behaved prosocially when offered a chance to help. Those who showed facial and physiological evidence of distress—frowning, lip biting, and a rise in heart rate—were less prosocial (Fabes et al., 1994; Miller et al., 1996). Similarly, empathy is related to EEG brain-wave activity—a mild increase in the left hemisphere (which houses positive emotion) among children showing facial signs of empathy. In contrast, children who do not show these empathic signs often display a sharp EEG increase in the right hemisphere (which houses negative emotion)—an indication that they are overwhelmed by negative emotion (Jones, Field, & Davalos, 2000; Pickens, Field, & Nawrocki, 2001).

Parenting profoundly influences empathy and sympathy. When parents are warm, encourage emotional expressiveness, and show sensitive, empathic concern for their youngsters' feelings, their children are likely to react in a concerned way to the distress of others—relationships that persist into adolescence and early adulthood (Koestner, Franz, & Weinberger, 1990; Michalik et al., 2007; Strayer & Roberts, 2004a). Besides modeling sympathy, parents can help children learn to regulate angry feelings, which disrupt empathy and sympathy. They can also teach children the importance of kindness and can intervene when they display inappropriate emotion—strategies that predict high levels of sympathetic responding (Eisenberg, 2003). And parents can provide opportunities for children to show sympathetic concern through charitable giving and community service activities.

In contrast, angry, punitive parenting disrupts empathy and sympathy at an early age—particularly among children who are poor emotion regulators and, therefore, respond to parental hostility with especially high levels of personal distress (Valiente et al., 2004). In one study, physically abused toddlers at a child-care center rarely expressed concern at a peer's unhappiness but, rather, reacted with fear, anger, and physical attacks (Klimes-Dougan & Kistner, 1990). The children's reactions resembled their parents' insensitive responses to others' suffering.

These findings, like others discussed so far, reveal wide variations in children's emotional dispositions. As we turn now to the topic of temperament, we will encounter additional evidence for the joint contributions of heredity and environment to these differences. But first, consult the Milestones table on the following page for an overview of the emotional attainments just considered.

ASK YOURSELF

Review ■ What do preschoolers understand about emotion, and how do cognition and social experience contribute to their understanding?

Connect ■ Why is good emotional self-regulation vital for empathy to result in sympathy and prosocial behavior?

Connect ■ Cite ways that parenting contributes to emotional understanding, self-conscious emotions, empathy, and sympathy. Do you see any patterns? Explain.

Apply ■ When 15-month-old Ellen fell down while running, she looked at her mother, who smiled and exclaimed, "Oh, wasn't that a funny tumble!" How is Ellen likely to respond emotionally, and why?

- ▶ What is temperament, and how is it measured?
- ▶ Discuss the roles of heredity and environment in the stability of temperament, the relationship of temperament to cognitive and social functioning, and the goodness-of-fit model.

Temperament and Development

When we describe one person as cheerful and upbeat, another as active and energetic, and still others as calm, cautious, persistent, or prone to angry outbursts, we are referring to **temperament**—early-appearing, stable individual differences in reactivity and self-regulation. *Reactivity* refers to variations in quickness and intensity of emotional arousal, attention, and motor action. *Self-regulation*, as we have seen, refers to strategies that modify

Milestones

Emotional Development

AGE	EMOTIONAL EXPRESSIVENESS	EMOTIONAL UNDERSTANDING
Birth–6 months	<ul style="list-style-type: none"> • Social smile emerges • Laughter appears • Expressions of happiness increase when interacting with familiar people • Emotional expressions gradually become organized signals that are meaningfully related to environmental events 	<ul style="list-style-type: none"> • Detects emotions by matching the caregiver's feeling tone in face-to-face communication
7–12 months	<ul style="list-style-type: none"> • Anger and fear increase in frequency and intensity • Uses caregiver as a secure base • Regulates emotion by approaching and retreating from stimulation 	<ul style="list-style-type: none"> • Detects the meaning of others' emotional signals • Engages in social referencing
1–2 years	<ul style="list-style-type: none"> • Self-conscious emotions emerge but depend on monitoring and encouragement of adults • Begins to use language to assist with emotional self-regulation 	<ul style="list-style-type: none"> • Begins to appreciate that others' emotional reactions may differ from one's own • Acquires a vocabulary of emotional terms • Displays empathy
3–6 years	<ul style="list-style-type: none"> • Self-conscious emotions are clearly linked to self-evaluation • As representation and language improve, uses active strategies for regulating emotion • Begins to conform to emotional display rules; can pose a positive emotion he or she does not feel 	<ul style="list-style-type: none"> • Understanding of causes, consequences, and behavioral signs of emotion improves in accuracy and complexity • As language develops, empathy becomes more reflective
7–11 years	<ul style="list-style-type: none"> • Self-conscious emotions are integrated with inner standards of excellence and good behavior • Uses internal strategies for engaging in emotional self-regulation; shifts adaptively between problem-centered and emotion-centered coping • Conformity to and conscious awareness of emotional display rules improve 	<ul style="list-style-type: none"> • Can reconcile conflicting cues when explaining others' emotions • Is aware that people can have mixed feelings and that their expressions may not reflect their true feelings • Empathy increases as emotional understanding and perspective taking improve



Note: These milestones represent overall age trends. Individual differences exist in the precise age at which each milestone is attained.

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that reactivity (Rothbart & Bates, 2006). The psychological traits that make up temperament are believed to form the cornerstone of the adult personality.

In 1956, Alexander Thomas and Stella Chess initiated the New York Longitudinal Study, a groundbreaking investigation of the development of temperament that followed 141 children from early infancy well into adulthood. Results showed that temperament can increase a child's chances of experiencing psychological problems or, alternatively, protect a child from the negative effects of a stressful home life. At the same time, Thomas and Chess (1977) discovered that parenting practices can modify children's temperaments considerably.

These findings stimulated a growing body of research on temperament, including its stability, biological roots, and interaction with child-rearing experiences. Let’s begin to explore these issues by looking at the structure, or makeup, of temperament and how it is measured.

The Structure of Temperament

Thomas and Chess’s model of temperament, consisting of nine dimensions listed in Table 10.1, inspired all others that followed. When detailed descriptions of infants’ and children’s behavior obtained from parent interviews were rated on these dimensions, certain characteristics clustered together, yielding three types of children:

- The **easy child** (40 percent of the sample) quickly establishes regular routines in infancy, is generally cheerful, and adapts easily to new experiences.
- The **difficult child** (10 percent of the sample) has irregular daily routines, is slow to accept new experiences, and tends to react negatively and intensely.
- The **slow-to-warm-up child** (15 percent of the sample) is inactive, shows mild, low-key reactions to environmental stimuli, is negative in mood, and adjusts slowly to new experiences.

Note that 35 percent of the children did not fit any of these categories. Instead, they showed unique blends of temperamental characteristics.

The difficult pattern has sparked the most interest because it places children at high risk for adjustment problems—both anxious withdrawal and aggressive behavior in early and middle childhood (Bates, Wachs, & Emde, 1994; Ramos et al., 2005; Thomas, Chess, & Birch, 1968). Compared with difficult children, slow-to-warm-up children present fewer problems in the early years. However, they tend to show excessive fearfulness and slow, constricted behavior in the late preschool and school years, when they are expected to respond

TABLE 10.1 Two Models of Temperament

THOMAS AND CHESS		ROTHBART	
Dimension	Description	Dimension	Description
Activity level	Ratio of active periods to inactive ones	Reactivity Activity level Attention span/persistence Fearful distress Irritable distress Positive affect	Level of gross-motor activity Duration of orienting or interest Wariness and distress in response to intense or novel stimuli, including time to adjust to new situations Extent of fussing, crying, and distress when desires are frustrated Frequency of expression of happiness and pleasure
Rhythmicity	Regularity of body functions, such as sleep, wakefulness, hunger, and excretion		
Distractibility	Degree to which stimulation from the environment alters behavior—for example, whether crying stops when a toy is offered		
Approach/withdrawal	Response to a new object, food, or person		
Adaptability	Ease with which child adapts to changes in the environment, such as sleeping or eating in a new place		
Attention span and persistence	Amount of time devoted to an activity, such as watching a mobile or playing with a toy	Self-Regulation Effortful control	Capacity to voluntarily suppress a dominant, reactive response in order to plan and execute a more adaptive response
Intensity of reaction	Energy level of response, such as laughing, crying, talking, or gross-motor activity		
Threshold of responsiveness	Intensity of stimulation required to evoke a response		
Quality of mood	Amount of friendly, joyful behavior as opposed to unpleasant, unfriendly behavior		

actively and quickly in classrooms and peer groups (Chess & Thomas, 1984; Schmitz et al., 1999).

Today, the most influential model of temperament is Mary Rothbart's (refer again to Table 10.1). It combines related traits proposed by Thomas and Chess and other researchers, yielding a concise list of just six dimensions. For example, "distractibility" and "attention span and persistence" are considered opposite ends of the same dimension, which is labeled "attention span/persistence." A unique feature of Rothbart's model is inclusion of both "fearful distress" and "irritable distress," which distinguish between reactivity triggered by fear and reactivity due to frustration. And the model deletes overly broad dimensions, such as "rhythmicity," "intensity of reaction," and "threshold of responsiveness" (Rothbart, Ahadi, & Evans, 2000; Rothbart & Mauro, 1990). A child who is rhythmic in sleeping is not necessarily rhythmic in eating or bowel habits. And a child who smiles and laughs intensely is not necessarily intense in fear, irritability, or motor activity.

Rothbart's dimensions are supported by factor analyses of many measures of children's temperament (see page 321 in Chapter 8 to review the concept of factor analysis). Notice how her dimensions represent the three underlying components included in the definition of temperament: (1) *emotion* ("fearful distress," "irritable distress," "positive affect," and "soothability"), (2) *attention* ("attention span/persistence"), and (3) *action* ("activity level"). According to Rothbart, individuals differ not only in their reactivity on each dimension but also in the self-regulatory dimension of temperament, **effortful control**—the capacity to voluntarily suppress a dominant response in order to plan and execute a more adaptive response (Rothbart, 2003; Rothbart & Bates, 2006). Variations in effortful control are evident in how effectively a child can focus and shift attention, inhibit impulses, and manage negative emotion.

TAKE A MOMENT... Turn back to page 287 in Chapter 7 to review the concept of *inhibition*, and note its strong resemblance to *effortful control*. As we will see later, researchers assess these capacities in similar ways. Their converging concepts, measures, and findings reveal that the same mental activities lead to effective regulation in both the cognitive and emotional/social domains.

Measuring Temperament

Temperament is often assessed through interviews or questionnaires given to parents. Behavior ratings by pediatricians, teachers, and others familiar with the child and laboratory observations by researchers have also been used. Parental reports are convenient and take advantage of parents' depth of knowledge of the child across many situations (Gartstein & Rothbart, 2003). Although information from parents has been criticized as being biased, parental reports are moderately related to researchers' observations of children's behavior (Majdandžić & van den Boom, 2007; Mangelsdorf, Schoppe, & Buur, 2000). And parent perceptions are vital for understanding how parents view and respond to their child.

Observations by researchers in the home or laboratory avoid the subjectivity of parental reports but can lead to other inaccuracies. In homes, observers find it hard to capture all relevant information, especially events that are rare but important, such as infants' response to frustration. And in the unfamiliar lab setting, fearful children who calmly avoid certain experiences at home may become too upset to complete the session if the lab does not permit avoidance (Wachs & Bates, 2001). Still, researchers can better control children's experiences in the lab. And they can conveniently combine observations of behavior with neurobiological measures to gain insight into the biological bases of temperament.

Most neurobiological research has focused on children who fall at opposite extremes of the positive-affect and fearful-distress dimensions of temperament: **inhibited**, or **shy, children**, who react negatively to and withdraw from novel stimuli; and **uninhibited**, or **sociable, children**, who display positive emotion to and approach novel stimuli. As the Biology and Environment box on page 420 reveals, biologically based reactivity—evident in heart rate, hormone levels, and EEG brain waves in the frontal region of the cerebral cortex—differentiates children with inhibited and uninhibited temperaments.

BIOLOGY and ENVIRONMENT

Development of Shyness and Sociability

Two 4-month-old babies, Larry and Mitch, visited the laboratory of Jerome Kagan, who observed their reactions to a variety of unfamiliar experiences. When exposed to new sights and sounds, such as a moving mobile decorated with colorful toys, Larry tensed his muscles, moved his arms and legs with agitation, and began to cry. In contrast, Mitch remained relaxed and quiet, smiling and cooing at the excitement around him.

As toddlers, Larry and Mitch returned to the laboratory, where they experienced several procedures designed to induce uncertainty. Electrodes were placed on their bodies and blood pressure cuffs on their arms to measure heart rate; toy robots, animals, and puppets moved before their eyes; and unfamiliar people entered and behaved in unexpected ways or wore novel costumes. While Larry whimpered and quickly withdrew, Mitch watched with interest, laughed at the strange sights, and approached the toys and strangers.

On a third visit, at age 4½, Larry barely talked or smiled during an interview with an unfamiliar adult. In contrast, Mitch asked questions and communicated his pleasure at each new activity. In a playroom with two unfamiliar peers, Larry pulled back and watched, while Mitch made friends quickly.

In longitudinal research on several hundred Caucasian infants followed into adolescence, Kagan found that about 20 percent of 4-month-old babies were, like Larry, easily upset by novelty; 40 percent, like Mitch, were comfortable, even delighted, with new experiences. About 20 to 30 percent of these extreme groups retained their temperamental styles as they grew older (Kagan, 2003; Kagan & Saudino, 2001; Kagan et al., 2007). But most children's dispositions became less extreme over time. Genetic makeup and child-rearing experiences jointly influenced stability and change in temperament.

Neurobiological Correlates of Shyness and Sociability

Individual differences in arousal of the *amygdala*, an inner brain structure that controls avoidance reactions, contribute to these contrasting temperaments. In shy, inhibited children, novel stimuli easily excite the amygdala and its connections to the cerebral cortex and sympathetic nervous system, which prepares the body to act in the face of threat. In sociable, uninhibited children, the same level of stimulation evokes minimal neural excitation (Kagan

& Fox, 2006). In support of this theory, while viewing photos of unfamiliar faces, adults who had been classified as inhibited in the second year of life showed greater fMRI activity in the amygdala than adults who had been uninhibited as toddlers (Schwartz et al., 2003). And additional neurobiological responses known to be mediated by the amygdala distinguish these two emotional styles:

- **Heart rate.** From the first few weeks of life, the heart rates of shy children are consistently higher than those of sociable children, and they speed up further in response to unfamiliar events (Schmidt et al., 2007; Snidman et al., 1995).
- **Cortisol.** Saliva concentrations of the stress hormone cortisol tend to be higher, and to rise more in response to a stressful event, in shy than in sociable children (Schmidt et al., 1997, 1999; Zimmermann & Stansbury, 2004).
- **Pupil dilation, blood pressure, and skin surface temperature.** Compared with sociable children, shy children tend to show greater pupil dilation, rise in blood pressure, and cooling of the fingertips when faced with novelty (Kagan et al., 1999, 2007).

Another physiological correlate of approach-withdrawal to people and objects is the pattern of EEG brain waves in the frontal lobes of the cerebral cortex. Shy infants and preschoolers show greater EEG activity in the right frontal lobe, which is associated with negative emotional reactivity; sociable children show the opposite pattern (Fox et al., 2008; Kagan et al., 2007). Neural activity in the amygdala, which is transmitted to the frontal lobes, probably contributes to these differences. Inhibited children also show greater generalized activation of the cerebral cortex, an indicator of high emotional arousal and monitoring of new situations for potential threats (Henderson et al., 2004).

Child-Rearing Practices

According to Kagan, extremely shy or sociable children inherit a physiology that biases them toward a particular temperamental style. Yet heritability research indicates that genes contribute only modestly to shyness and sociability (Kagan & Fox, 2006). Experience has a powerful impact.

Child-rearing practices affect the chances that an emotionally reactive baby will become a fearful child. Warm, supportive parenting reduces shy infants' and preschoolers' intense

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A strong physiological response to novel stimuli prompts this child to cling to his father. With patient, insistent encouragement, parents can help shy children overcome the urge to retreat from unfamiliar events.

physiological reaction to novelty, whereas cold, intrusive parenting heightens anxiety (Coplan, Arbeau, & Armer, 2008; Hane et al., 2008). And if parents overprotect infants and young children who dislike novelty, they make it harder for the child to overcome an urge to retreat. Parents who make appropriate demands for their child to approach new experiences help shy youngsters develop strategies for regulating fear (Rubin & Burgess, 2002).

When inhibition persists, it leads to excessive cautiousness, low self-esteem, and loneliness (Fordham & Stevenson-Hinde, 1999; Rubin, Stewart, & Coplan, 1995). In adolescence, persistent shyness increases the risk of severe anxiety, especially social phobia—intense fear of being humiliated in social situations (Kagan & Fox, 2006). For inhibited children to acquire effective social skills, parenting must be tailored to their temperaments—a theme we will encounter again in this and later chapters.

Stability of Temperament

Young children who score low or high on attention span, irritability, sociability, shyness, or effortful control tend to respond similarly when assessed again several months to a few years later and, occasionally, even into the adult years (Caspi et al., 2003; Kochanska & Knack, 2003; Majdandžić & van den Boom, 2007; Rothbart, Ahadi, & Evans, 2000; van den Akker et al., 2010). However, the overall stability of temperament is low in infancy and toddlerhood and only moderate from the preschool years on (Putnam, Samson, & Rothbart, 2000). Some children remain the same, but many others change.

Why isn't temperament more stable? A major reason is that temperament itself develops with age. To illustrate, let's look at irritability and activity level. Recall from Chapter 4 that most babies fuss and cry in the early months. As infants better regulate their attention and emotions, many who initially seemed irritable become calm and content. In the case of activity level, the meaning of the behavior changes. At first, an active, wriggling infant tends to be highly aroused and uncomfortable, whereas an inactive baby is often alert and attentive. Once infants move on their own, the reverse is so! An active crawler is usually alert and interested in exploration, whereas a very inactive baby may be fearful and withdrawn.

These discrepancies help us understand why long-term prediction from early temperament is best achieved after age 3, when children's styles of responding are better established (Roberts & DelVecchio, 2000). In line with this idea, between ages 2½ and 3, children improve substantially and also perform more consistently across a wide variety of tasks requiring effortful control, such as waiting for a reward, lowering their voice to a whisper, succeeding at games like "Simon Says," and selectively attending to one stimulus while ignoring competing stimuli (Kochanska, Murray, & Harlan, 2000; Li-Grining, 2007). Researchers believe that around this time, areas in the prefrontal cortex involved in suppressing impulses develop rapidly (Gerardi-Caulton, 2000; Rothbart & Bates, 2006).

Nevertheless, the ease with which children manage their reactivity in early childhood depends on the type and strength of the reactive emotion involved. Preschoolers who were highly fearful as 2-year-olds score slightly better than their age-mates in effortful control as 4-year-olds. In contrast, angry, irritable 2-year-olds tend to be less effective at effortful control at later ages (Bridgett et al., 2009; Kochanska & Knaack, 2003; Kochanska, Murray, & Harlan, 2000).

In sum, many factors affect the extent to which a child's temperament remains stable, including development of the biological systems on which temperament is based, the child's capacity for effortful control, and the success of her efforts, which depend on the quality and intensity of her emotional reactivity. When we consider the evidence as a whole, the low to moderate stability of temperament makes sense. It also confirms that experience can modify biologically based temperamental traits considerably, although children rarely change from one extreme to another—that is, a shy preschooler practically never becomes highly sociable, and irritable children seldom become easy-going. With these ideas in mind, let's turn to genetic and environmental contributions to temperament and personality.

Genetic and Environmental Influences

The word *temperament* implies a genetic foundation for individual differences in personality. Research indicates that identical twins are more similar than fraternal twins across a wide range of temperamental traits (activity level, attention span, shyness/sociability, irritability, and effortful control) and personality measures (introversion/extroversion, anxiety, agreeableness, curiosity and imaginativeness, and impulsivity) (Bouchard, 2004; Bouchard & Loehlin, 2001; Caspi & Shiner, 2006; Roisman & Fraley, 2006; Saudino & Cherny, 2001). In Chapter 3, we noted that heritability estimates derived from twin studies suggest a moderate role for genetic factors in temperament and personality: About half of individual differences have been attributed to differences in genetic makeup.

Nevertheless, genetic influences vary with the temperamental trait and the age of the individual being studied. For example, heritability estimates are higher for expressions of negative emotion than for positive emotion. And the role of heredity is considerably less in infancy than in childhood and later years, when temperament becomes more stable (Wachs & Bates, 2001).

Although genetic influences on temperament are clear, environment is also powerful. For example, persistent nutritional and emotional deprivation profoundly alters temperament, resulting in maladaptive emotional reactivity. Recall from Chapter 5 that even after dietary improvement, children exposed to severe malnutrition in infancy remain more distractible and fearful than their age-mates. Also, higher levels of home noise and crowding are linked to withdrawal and irritability in the second year (Matheny & Phillips, 2001; Wachs, 2006). And earlier in this chapter, we noted that children who spent their infancy in deprived orphanages are easily overwhelmed by stressful events. Their poor regulation of emotion results in inattention and weak impulse control, including frequent expressions of anger (see page 197).

Other research shows that child rearing has much to do with whether infants and young children maintain their temperamental traits. In fact, heredity and environment often jointly contribute to temperament, since a child's approach to the world affects the experiences to which she is exposed. To illustrate how this works, let's look closely at ethnic differences in temperament.



This Japanese grandmother holds her grandchild close while interacting gently and soothingly. These caregiving behaviors contribute to Japanese babies' calm, emotionally restrained temperamental style.

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Cultural Variations Compared with North American Caucasian infants, Chinese and Japanese babies tend to be less active, irritable, and vocal; more easily soothed when upset; and better at quieting themselves (Kagan et al., 1994; Lewis, Ramsay, & Kawakami, 1993). Chinese and Japanese babies are also more fearful and inhibited, remaining closer to their mothers in an unfamiliar playroom and displaying more anxiety when interacting with a stranger (Chen, Wang, & DeSouza, 2006). And they are more emotionally restrained, smiling, laughing, and crying less than Caucasian-American babies (Camras et al., 1998; Garstein et al., 2010).

These variations may have genetic roots, but they are supported by cultural beliefs and practices. Japanese mothers usually say that babies come into the world as independent beings who must learn to rely on their parents through close physical contact. American mothers typically believe just the opposite—that they must wean the baby away from dependency toward autonomy.

Consistent with these beliefs, Asian mothers interact gently, soothingly, and gesturally with their babies, whereas Caucasian mothers use a more active, stimulating, verbal approach (Rothbaum et al., 2000b). Also, recall from our discussion of emotional self-regulation that Chinese and Japanese adults discourage babies from expressing strong emotion, which contributes further to their infants' tranquility.

Nonshared Environment In families with several children, an additional influence on temperament is at work. Recall from Chapter 8 that *nonshared environmental influences*—those that make siblings different from one another—play an important role in intelligence. They are also influential in personality development. **TAKE A MOMENT...** Ask several parents to describe each of their children's personalities. You will see that they often emphasize differences between siblings: "She's a lot more active." "He's more sociable." "She's far more persistent." As a result, parents often regard siblings as more distinct than other observers do. In a large study of 1- to 3-year-old twin pairs, parents rated identical twins as resembling each other less in temperament than researchers' ratings indicated. And whereas researchers rated

fraternal twins as moderately similar, parents viewed them as somewhat opposite in temperamental style (see Figure 10.2) (Saudino, 2003).

Parents' tendency to emphasize each child's unique qualities affects their child-rearing practices. In a study of 3-year-old identical twins, mothers' differential treatment of each twin predicted differences between twins in psychological adjustment. The pair member who received more warmth and less harshness was more positive in mood and prosocial behavior and less likely to have behavior problems (Deater-Deckard et al., 2001). Each child, in turn, evokes responses from caregivers that are consistent with parental beliefs and the child's developing temperament.

Besides different experiences within the family, siblings have distinct experiences with teachers, peers, and others in their community that affect personality development. And as they get older, siblings often seek ways to differ from one another. For all these reasons, both identical and fraternal twins tend to become increasingly dissimilar in personality with age (Loehlin & Martin, 2001; McCartney, Harris, & Bernieri, 1990). The less contact twins have with each other, the stronger this effect.

Are nonshared factors more important in personality development than *shared environmental influences*—those that affect all siblings similarly? In Chapter 14, we will see that shared factors, such as family stress and child-rearing styles, also affect children's personalities. In sum, we must think of temperament and personality as affected by a complex mix of environmental conditions, some child-specific and others stemming from shared family conditions.

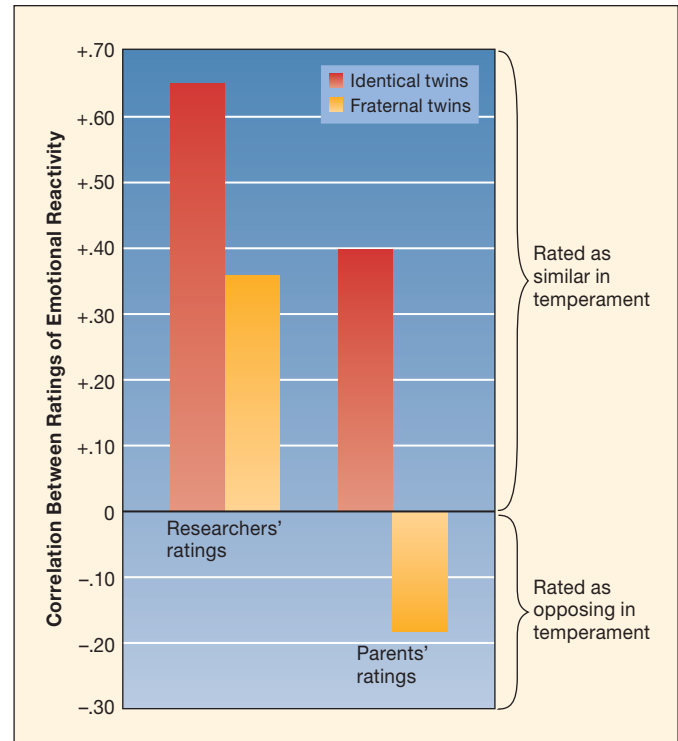


FIGURE 10.2 Temperament correlations for identical and fraternal twin pairs, as rated by researchers and parents. Parents rated 1- to 3-year-old identical twins as resembling each other less in temperament than researchers did. And whereas researchers rated fraternal twins as moderately similar, parents rated them as somewhat opposing in temperament. The correlations depicted here are for emotional reactivity. Activity level, shyness, and attention span/persistence yielded similar findings. (Adapted from Saudino, 2003.)

Temperament as a Predictor of Children's Behavior

Research on temperament provides a powerful illustration of the child's contribution to his or her own development. Children's temperamental traits consistently predict their cognitive and social functioning.

Almost as soon as it can be measured, children's attention span forecasts their learning and cognitive development. For example, persistence during the first year correlates with infant mental test scores and preschool IQ (Matheny, 1989). During early and middle childhood, persistence continues to predict IQ, along with literacy and mathematical progress and grades in school. In contrast, distractibility, high activity level, and difficult temperament are linked to poor school performance (Coplan, Barber, & Lagacé-Séguin, 1999; Martin, Olejnik, & Gaddis, 1994; Strelau, Zawadzki, & Piotrowska, 2001).

Temperament is also related to social behavior. Highly active preschoolers tend to be sociable with peers, but they also become involved in more conflict than their less active agemates. Shy, inhibited children often watch classmates and engage in anxious behaviors that discourage interaction, such as hovering around play activities and rarely speaking (Chen, Wang, & DeSouza, 2006; Henderson et al., 2004). And as we will see in Chapter 12, inhibited children's high anxiety leads to more discomfort after wrongdoing and a greater sense of responsibility to others. As a result, early fearfulness protects children against becoming aggressive. In contrast, irritable, impulsive children are at risk for aggressive and antisocial conduct (Sanson, Hemphill, & Smart, 2004; Vitaro et al., 2006).

In some cases, as with shy children, social behavior seems to be a direct result of temperament. In other instances, it reflects the way people respond to the child's emotional style.



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These fifth graders collaborating on a science project exhibit a high capacity for effortful control—a dimension of temperament that predicts academic achievement and many other favorable outcomes.

For example, active, impulsive and irritable, anger-prone children often elicit negative interaction, which leads to conflict (Bridgett et al., 2009; van den Akker et al., 2010). As Chapter 12 will make clear, the relationship of early impulsivity and emotional negativity with later aggression and lawbreaking acts has much to do with the inept parenting often evoked by distractible, head-strong children.

Finally, beginning in the preschool years, children's capacity for effortful control is linked to favorable development and adjustment in cultures as diverse as China and the United States (Zhou, Lengua, & Wang, 2009). Positive outcomes include persistence, task mastery, academic achievement, cooperation, moral maturity (such as concern about wrongdoing and willingness to apologize), empathy, sympathy, and prosocial behaviors of sharing and helpfulness (Eisenberg, 2010; Kochanska & Aksan, 2006; Posner & Rothbart, 2007; Valiente, Lemery-

Chalfant, & Swanson, 2010). Effortful control is also positively related to children's resistance to stress. For example, it buffers them against the negative impact of parental conflict, perhaps because children high in effortful control can shift attention away from their parents' negative behaviors and their own anxiety to more positive features of their social environments (David & Murphy, 2007). At the same time, as we will see next, parenting practices can impede or promote children's effortful control, thereby profoundly altering the link between early temperament and development.

Temperament and Child Rearing: The Goodness-of-Fit Model

If a child's disposition interferes with learning or getting along with others, adults must gently but consistently counteract the child's maladaptive style. Thomas and Chess (1977) proposed a **goodness-of-fit model** to explain how temperament and environment together can produce favorable outcomes. Goodness of fit involves creating child-rearing environments that recognize each child's temperament while encouraging more adaptive functioning.

Goodness of fit helps explain why difficult children (who withdraw from new experiences and react negatively and intensely) are at high risk for later adjustment problems. These children frequently experience parenting that fits poorly with their dispositions. As infants, they are less likely to receive sensitive caregiving (van den Boom & Hoeksma, 1994). By the second year, their parents—especially in low-SES families—tend to use angry, punitive discipline, which undermines the development of effortful control. As the child reacts with defiance and disobedience, parents become increasingly stressed (Bridgett et al., 2009; Paulussen-Hoogeboom et al., 2007). As a result, they continue their coercive tactics and also discipline inconsistently, sometimes rewarding the child's noncompliance by giving in to it (Calkins, 2002). These practices sustain and even increase the child's irritable, conflict-ridden style (van Aken et al., 2007; Pesonen et al., 2008).

In contrast, when parents are positive and sensitive, which helps babies regulate emotion, difficultness declines by age 2 to 3 (Feldman, Greenbaum, & Yirmiya, 1999; Raikes et al., 2007). In toddlerhood and childhood, parental sensitivity, support, clear expectations, and limits foster effortful control, reducing the likelihood that difficultness will persist and lead to emotional and social difficulties (Cipriano & Stifter, 2010; Jaffari-Bimmel et al., 2006).

Recent evidence indicates that temperamentally difficult children function much worse than other children when exposed to inept parenting, yet benefit most from good parenting (Pluess & Belsky, 2011). Using molecular genetic analyses, researchers are investigating gene–environment interactions (see page 121 in Chapter 3) that explain this finding. In one

study, 2-year-olds with a chromosome 17 gene containing a certain repetition of DNA base pairs (called short 5-HTTLPR), which interferes with functioning of the inhibitory neurotransmitter serotonin (and, thus, greatly increases the risk of negative mood and self-regulation difficulties), became increasingly irritable as their mothers' anxiety about parenting increased (Ivorra et al., 2010). Maternal anxiety had little impact on children without this genetic marker. In another investigation, preschoolers with the short 5-HTTLPR gene benefited, especially, from positive parenting. With parental affection and support, their capacity for self-regulation equaled that of age-mates with a low-risk genotype (Kochanska, Philibert, & Barry, 2009).

Effective parenting of challenging children, however, also depends on life conditions—good parental mental health, marital harmony, and favorable economic conditions (Schoppe-Sullivan et al., 2007). In a comparison of the temperaments of Russian and U.S. babies, Russian infants were more emotionally negative, fearful, and upset when frustrated (Gartstein, Slobodskaya, & Kinsht, 2003). At the time of the study, Russia's national economy was severely depressed. Because of financial worries and longer work hours, Russian parents may have lacked time and energy for the patient parenting that protects against difficulty.

Cultural values also affect the fit between parenting and child temperament, as research in China illustrates. In the past, collectivist values, which discourage self-assertion, led Chinese adults to evaluate shy children positively. Several studies showed that shy Chinese children of a decade or two ago appeared well-adjusted, both academically and socially (Chen, Rubin, & Li, 1995; Chen et al., 1998). But rapid expansion of a market economy in China, which requires assertiveness and sociability for success, may be responsible for a recent change in Chinese parents' and teachers' attitudes toward childhood shyness (Chen, Wang, & DeSouza, 2006; Yu, 2002). Among Shanghai fourth graders, the association between shyness and adjustment also changed over time. Whereas shyness was positively correlated with teacher-rated competence, peer acceptance, leadership, and academic achievement in 1990, these relationships weakened in 1998 and reversed in 2002, when they mirrored findings of Western research (see Figure 10.3) (Chen et al., 2005). Cultural context makes a difference in whether shy children receive support or disapproval and whether they adjust well or poorly.

An effective match between rearing conditions and child temperament is best accomplished early, before unfavorable temperament–environment relationships produce maladjustment. Both difficult and shy children benefit from warm, accepting parenting that makes firm but reasonable demands for mastering new experiences. With reserved, inactive toddlers, highly stimulating parenting—questioning, instructing, and pointing out objects—fosters exploration. Yet for highly active toddlers, these same parental behaviors are too directive, dampening their play and curiosity (Miceli et al., 1998).

The goodness-of-fit model reminds us that babies have unique dispositions that adults must accept. Parents can neither take full credit for their children's virtues nor be blamed for all their faults. But parents can turn an environment that exaggerates a child's problems into one that builds on the child's strengths. In the following sections, we will see that goodness of fit is also at the heart of infant–caregiver attachment. This first intimate relationship grows out of interaction between parent and baby, to which the emotional styles of both partners contribute.

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A parent's firm but affectionate approach to child rearing can help temperamentally difficult children gain in self-regulatory capacity.

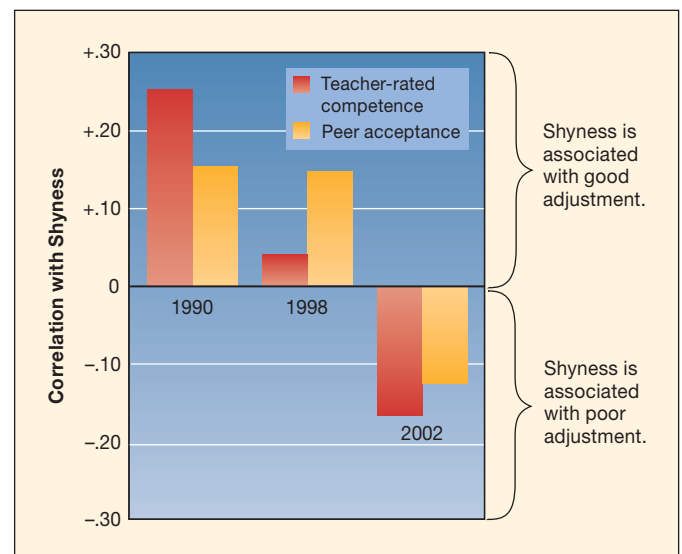


FIGURE 10.3 Changes over time in correlations between shyness and adjustment among Chinese fourth graders. In 1990, shy Chinese children appeared well-adjusted. But as China's market economy expanded and valuing of self-assertion and sociability increased, the direction of the correlations shifted. In 2002, shyness was negatively associated with adjustment. These findings are for teacher-rated competence and peer acceptance. Those for leadership (holding offices in student organizations) and academic achievement changed similarly. (Adapted from Chen et al., 2005.)

A S K Y O U R S E L F

Review ■ How do genetic and environmental factors work together to influence temperament? Cite examples from research on nonshared environmental influences, cultural variations in temperament, and goodness of fit.

Connect ■ Do findings on ethnic differences in temperament illustrate genetic–environmental correlation, discussed on pages 122–123 in Chapter 3? Explain.

Apply ■ Mandy and Jeff are parents of 2-year-old inhibited Sam and 3-year-old difficult Maria. Explain the importance of effortful control to Mandy and Jeff, and suggest ways they can strengthen it in each of their children.

Reflect ■ How would you describe your temperament as a young child? Do you think it has remained stable, or has it changed? What factors might be involved?

- ▶ What are the unique features of ethological theory of attachment?
- ▶ Describe how researchers measure the security of attachment, and discuss the stability of attachment patterns.
- ▶ Discuss infants' formation of multiple attachments and the role of early attachment quality in later development.

Development of Attachment

Attachment is the strong, affectionate tie we have with special people in our lives that leads us to experience pleasure and joy when we interact with them and to be comforted by their nearness in times of stress. By the second half of the first year, infants have become attached to familiar people who have responded to their needs.

TAKE A MOMENT... Watch how babies of this age single out their parents for special attention. When the parent enters the room, the baby breaks into a broad, friendly smile. When she picks him up, he pats her face, explores her hair, and snuggles against her. When he feels anxious or afraid, he crawls into her lap and clings closely.

Freud first suggested that the infant's emotional tie to the mother is the foundation for all later relationships. Contemporary research indicates that—although the parent–infant bond is vitally important—later development is influenced not just by early attachment experiences but also by the continuing quality of the parent–child relationship.

Attachment has also been the subject of intense theoretical debate. Recall from Chapter 1 how the *psychoanalytic perspective* regards feeding as the central context in which caregivers and babies build this close emotional bond. *Behaviorism*, too, emphasizes the importance of feeding, but for different reasons. According to a well-known behaviorist explanation, infants learn to prefer the mother's soft caresses, warm smiles, and tender words because these events are paired with tension relief as she satisfies the baby's hunger.

Although feeding is an important context for building a close relationship, attachment does not depend on hunger satisfaction. In the 1950s, a famous experiment showed that rhesus monkeys reared with terry-cloth and wire-mesh “surrogate mothers” clung to the soft terry-cloth substitute, even though the wire-mesh “mother” held the bottle and infants had to climb on it to be fed (Harlow & Zimmerman, 1959). Human infants, too, become attached to family members who seldom feed them, including fathers, siblings, and grandparents. And toddlers in Western cultures who sleep alone and experience frequent daytime separations from their parents sometimes develop strong emotional ties to cuddly objects, such as blankets or teddy bears, that play no role in infant feeding!

Both psychoanalytic and behaviorist accounts of attachment have another problem: They emphasize the caregiver's contribution to the attachment relationship but pay little attention to the importance of the infant's characteristics.



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Baby monkeys reared with “surrogate mothers” preferred to cling to a soft terry-cloth “mother” over a wire-mesh “mother” holding a bottle—evidence that parent–infant attachment is based on more than satisfaction of hunger.

Bowlby's Ethological Theory

Today, **ethological theory of attachment**, which recognizes the infant's emotional tie to the caregiver as an evolved response that promotes survival, is the most widely accepted view. John Bowlby (1969), who first applied this idea to the infant–caregiver

bond, retained the psychoanalytic idea that quality of attachment to the caregiver has profound implications for the child's feelings of security and capacity to form trusting relationships.

At the same time, Bowlby was inspired by Konrad Lorenz's studies of imprinting (see Chapter 1). Bowlby believed that the human infant, like the young of other animal species, is endowed with a set of built-in behaviors that keep the parent nearby to protect the infant from danger and to provide support for exploring and mastering the environment (Waters & Cummings, 2000). Contact with the parent also ensures that the baby will be fed, but Bowlby pointed out that feeding is not the basis for attachment. Rather, attachment can best be understood in an evolutionary context in which survival of the species—through ensuring both safety and competence—is of utmost importance.

According to Bowlby, the infant's relationship with the parent begins as a set of innate signals that call the adult to the baby's side. Over time, a true affectionate bond forms, supported by new emotional and cognitive capacities as well as by a history of warm, sensitive care. Attachment develops in four phases:

1. *Preattachment phase* (birth to 6 weeks). Built-in signals—grasping, smiling, crying, and gazing into the adult's eyes—help bring newborn babies into close contact with other humans. Babies of this age recognize their own mother's smell, voice, and face (see Chapter 4). But they are not yet attached to her, since they do not mind being left with an unfamiliar adult.
2. *"Attachment-in-the-making" phase* (6 weeks to 6 to 8 months). During this phase, infants respond differently to a familiar caregiver than to a stranger. For example, the baby smiles, laughs, and babbles more freely with the mother and quiets more quickly when she picks him up. As infants learn that their own actions affect the behavior of those around them, they begin to develop a *sense of trust*—the expectation that the caregiver will respond when signaled—but they still do not protest when separated from her.
3. *"Clear-cut" attachment phase* (6 to 8 months to 18 months to 2 years). Now attachment to the familiar caregiver is evident. Babies display **separation anxiety**, becoming upset when their trusted caregiver leaves. Like stranger anxiety (see page 405), separation anxiety does not always occur; it depends on infant temperament and the current situation. But in many cultures, separation anxiety increases between 6 and 15 months, suggesting that infants have developed a clear understanding that the caregiver continues to exist when not in view. Consistent with this idea, babies who have not yet mastered Piagetian object permanence usually do not become anxious when separated from the parent (Lester et al., 1974).

Besides protesting the parent's departure, older infants and toddlers try hard to maintain her presence. They approach, follow, and climb on her in preference to others. And they use the familiar caregiver as a secure base from which to explore.

4. *Formation of a reciprocal relationship* (18 months to 2 years and on). By the end of the second year, rapid growth in representation and language enables toddlers to understand some of the factors that influence the parent's coming and going and to predict her return. As a result, separation protest declines. Now children negotiate with the caregiver, using requests and persuasion to alter her goals. For example, one 2-year-old asked her parents to read a story before leaving her with a babysitter. The extra time with her parents, along with a better understanding of where they were going ("to have dinner with Uncle Charlie") and when they would be back ("right after you go to sleep"), helped this child withstand her parents' absence.

LOOK and LISTEN

Watch an 8- to 18-month-old at play for 20 to 30 minutes. Describe the baby's use of the parent or other familiar caregiver as a secure base from which to explore.

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Because this 2-year-old has the language and representational skills to predict his mother's return, separation anxiety declines. He accepts his mother's departure.

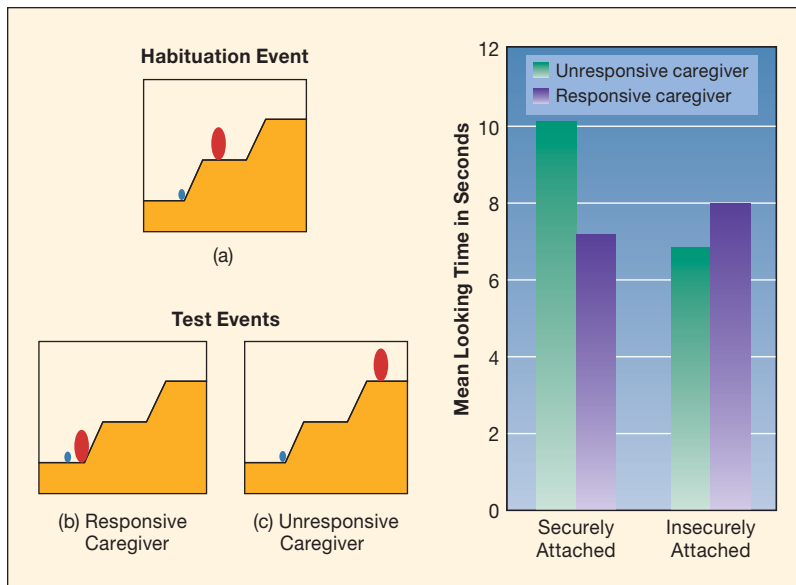


FIGURE 10.4 Testing toddlers for internal working models of attachment. (a) First, 12- to 16-month-olds were habituated to a video of two animated shapes, one large (the “caregiver”) and one small (the “child”). The caregiver traveled halfway up an incline to a plateau, and the child began to “cry,” depicted by pulsing and bouncing accompanied by an infant cry. Next the researchers presented two test events: (b) In the *responsive-caregiver outcome*, the caregiver returned to the child. (c) In the *unresponsive-caregiver outcome*, the caregiver continued up the slope away from the child. Securely attached toddlers looked longer at the unresponsive outcome, depicting caregiver behavior inconsistent with their attachment-related expectations. Insecurely attached toddlers did not differentiate between the two test events. (Adapted from Johnson, Dweck, & Chen, 2007.)

attached toddlers, in contrast, did not distinguish between the two (see Figure 10.4) (Johnson, Dweck, & Chen, 2007; Johnson et al., 2010). With age, children continually revise and expand their internal working model as their cognitive, emotional, and social capacities increase and as they interact with parents and form other close bonds with adults, siblings, and friends.

Measuring the Security of Attachment

Although all family-reared babies become attached to a familiar caregiver by the second year, the quality of this relationship differs from child to child. Some infants appear relaxed and secure in the presence of the caregiver; they know they can count on her for protection and support. Others seem anxious and uncertain.

A widely used laboratory technique for assessing the quality of attachment between 1 and 2 years of age is the **Strange Situation**. In designing it, Mary Ainsworth and her colleagues (1978) reasoned that securely attached infants and toddlers should use the parent as a secure base from which to explore in an unfamiliar playroom. In addition, when the parent leaves, an unfamiliar adult should be less comforting than the parent. The Strange Situation takes the baby through eight short episodes in which brief separations from and reunions with the caregiver occur (see Table 10.2).

Observing infants’ responses to these episodes, researchers identified a secure attachment pattern and three patterns of insecurity; a few babies cannot be classified (Ainsworth et al., 1978; Barnett & Vondra, 1999; Main & Solomon, 1990; Thompson, 2006). Although separation anxiety varies among the groups, the baby’s reunion responses define attachment quality.

- **Secure attachment.** These infants use the parent as a secure base. When separated, they may or may not cry, but if they do, it is because the parent is absent and they prefer her to the stranger. When the parent returns, they actively seek contact, and their crying is reduced immediately. About 60 percent of North American infants in middle-SES families show this pattern. (In low-SES families, a smaller proportion of babies show the secure pattern, with higher proportions falling into the insecure patterns.)
- **Avoidant attachment.** These infants seem unresponsive to the parent when she is present. When she leaves, they usually are not distressed, and they react to the stranger in much the same way as to the parent. During reunion, they avoid or are slow to greet the parent, and when picked up, they often fail to cling. About 15 percent of North American infants in middle-SES families show this pattern.

According to Bowlby (1980), out of their experiences during these four phases, children construct an enduring affectionate tie that they can use as a secure base in the parents’ absence. This image serves as an **internal working model**, or set of expectations about the availability of attachment figures, their likelihood of providing support during times of stress, and the self’s interaction with those figures. The internal working model becomes a vital part of personality, serving as a guide for all future close relationships (Bretherton & Munholland, 1999).

Consistent with these ideas, as early as the second year, toddlers form attachment-related expectations about parental comfort and support. In two studies, securely attached 12- to 16-month-olds looked longer at a video of an unresponsive caregiver (inconsistent with their expectations) than a video of a responsive caregiver. Insecurely

TABLE 10.2 | Episodes in the Strange Situation

EPISODE	EVENTS	ATTACHMENT BEHAVIOR OBSERVED
1	Researcher introduces parent and baby to playroom and then leaves.	
2	Parent is seated while baby plays with toys.	Parent as a secure base
3	Stranger enters, is seated, and talks to parent.	Reaction to unfamiliar adult
4	Parent leaves room. Stranger responds to baby and offers comfort if baby is upset.	Separation anxiety
5	Parent returns, greets baby, and offers comfort if necessary. Stranger leaves room.	Reaction to reunion
6	Parent leaves room.	Separation anxiety
7	Stranger enters room and offers comfort.	Ability to be soothed by stranger
8	Parent returns, greets baby, offers comfort if necessary, and tries to reinterest baby in toys.	Reaction to reunion

Note: Episode 1 lasts about 30 seconds; each of the remaining episodes lasts about 3 minutes. Separation episodes are cut short if the baby becomes very upset. Reunion episodes are extended if the baby needs more time to calm down and return to play.

Source: Ainsworth et al., 1978.

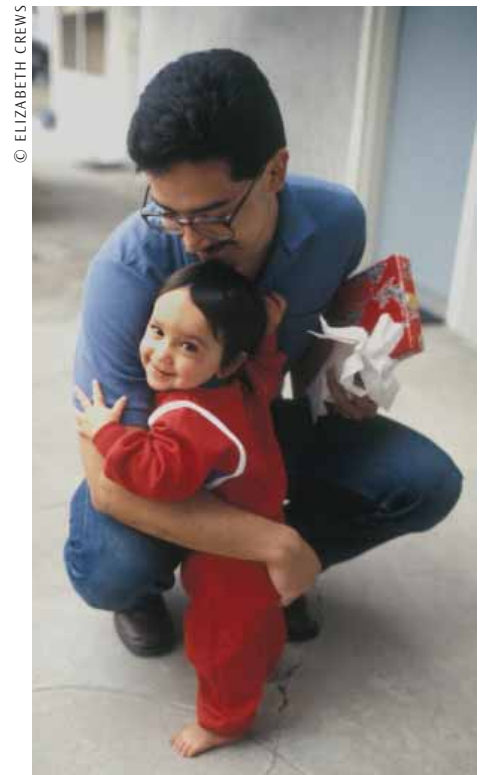
- **Resistant attachment.** Before separation, these infants seek closeness to the parent and often fail to explore. When the parent leaves, they are usually distressed, and on her return they combine clinginess with angry, resistive behavior, struggling when held and sometimes hitting and pushing. Many continue to cry and cling after being picked up and cannot be comforted easily. About 10 percent of North American infants in middle-SES families show this pattern.
- **Disorganized/disoriented attachment.** This pattern reflects the greatest insecurity. At reunion, these infants show confused, contradictory behaviors—for example, looking away while the parent is holding them or approaching the parent with flat, depressed emotion. Most display a dazed facial expression, and a few cry out unexpectedly after having calmed down or display odd, frozen postures. About 15 percent of North American infants in middle-SES families show this pattern.

Researchers have modified Strange Situation procedures to make them appropriate for preschoolers, looking closely at the child's seeking of physical closeness, eye contact, expressions of emotion, and content and style of parent-directed speech—especially during reunion episodes. The resulting preschool attachment classifications are modestly associated with previously obtained infant assessments (Crittenden, 2000; Main & Cassidy, 1988; Moss et al., 2005b).

An alternative method, the **Attachment Q-Sort**, suitable for children between 1 and 4 years, depends on home observations (Waters et al., 1995). Either the parent or a highly trained observer sorts 90 behaviors—such as “Child greets mother with a big smile when she enters the room,” “If mother moves very far, child follows along,” and “Child uses mother's facial expressions as a good source of information when something looks risky or threatening”—into nine categories, ranging from “highly descriptive” to “not at all descriptive” of the child. Then a score, ranging from high to low in security, is computed.

Because the Q-Sort taps a wider array of attachment-related behaviors than the Strange Situation, it may better reflect the parent–child relationship in everyday life. However, the Q-sort method is time-consuming, requiring a nonparent informant to spend several hours observing the child before sorting the descriptors, and it does not differentiate between types of insecurity. The Q-Sort responses of expert observers correspond well with babies' secure-base behavior in the

This securely attached 1-year-old actively seeks contact and is calmed by his father's return. An avoidantly attached toddler would be slow to greet the parent; a resistantly attached child would be both clingy and angry.



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Strange Situation; more research is needed to verify a correspondence for preschoolers (Posada, 2006). Parents' Q-Sorts, however, show little relationship with Strange Situation assessments (van IJzendoorn et al., 2004). Parents of insecure children, especially, may have difficulty accurately reporting their child's attachment behaviors.

Stability of Attachment

Research on the stability of attachment patterns between 1 and 2 years of age yields a wide range of findings. In some studies, as many as 70 to 90 percent of babies remain the same in their reactions to parents; in others, only 30 to 40 percent do (Thompson, 2000, 2006). A close look at which babies stay the same and which ones change yields a more consistent picture. Quality of attachment is usually secure and stable for middle-SES babies experiencing favorable life conditions. And infants who move from insecurity to security typically have well-adjusted mothers with positive family and friendship ties. Perhaps many became parents before they were psychologically ready but, with social support, grew into the role.

In contrast, in low-SES families with many daily stresses and little social support, attachment generally moves away from security or changes from one insecure pattern to another (Belsky et al., 1996; Fish, 2004; Vondra, Hommerding, & Shaw, 1999; Vondra et al., 2001). In one long-term follow-up of a poverty-stricken sample, many securely attached infants ended up insecure when reassessed in early adulthood. Child maltreatment, maternal depression, and poor family functioning in adolescence distinguished these young people from the few who stayed securely attached (Weinfeld, Sroufe, & Egeland, 2000; Weinfeld, Whaley, & Egeland, 2004).

These findings indicate that securely attached babies more often maintain their attachment status than insecure babies, whose relationship with the caregiver is, by definition, fragile and uncertain. The exception is disorganized/disoriented attachment—an insecure pattern that is as stable as attachment security: Nearly 70 percent retain this classification over the second year, and the majority remain highly insecure over the long term, continuing to express confused, ambivalent feelings toward parents in early adulthood (Hesse & Main, 2000; Sroufe et al., 2005; Weinfeld, Whaley, & Egeland, 2004).

As you will soon see, many disorganized/disoriented infants experience extremely negative caregiving, which may disrupt emotional self-regulation so severely that attachment disorganization persists.

Cultural Variations

Cross-cultural evidence indicates that attachment patterns may have to be interpreted differently in certain cultures. For example, as Figure 10.5 reveals, German infants show considerably more avoidant attachment than American babies do. But German parents value independence and encourage their infants to be non-clingy, so the baby's behavior may be an intended outcome of cultural beliefs and practices (Grossmann et al., 1985). In contrast, a study of infants of the Dogon people of Mali, Africa, revealed that none showed avoidant attachment to their mothers (True, Pisani, & Oumar, 2001). Even when grandmothers are primary caregivers (as they are with firstborn sons), Dogon mothers remain available to their babies, holding them close and nursing them promptly in response to hunger and distress.

Japanese infants, as well, rarely show avoidant attachment (refer again to Figure 10.5). Rather, many are resistantly attached, but this reaction may not represent true insecurity. Japanese mothers spend much

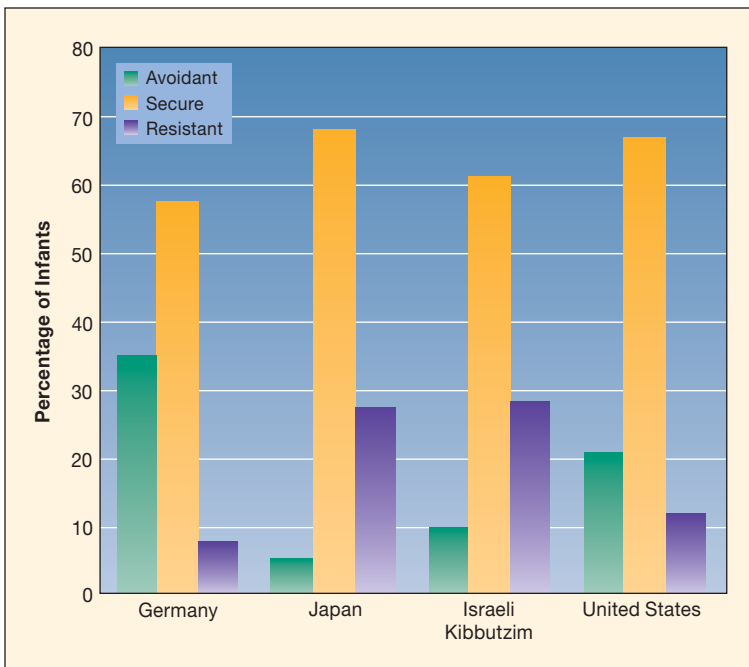


FIGURE 10.5 A cross-cultural comparison of infants' reactions in the Strange Situation. A high percentage of German babies seem avoidantly attached, whereas a substantial number of Japanese and Israeli kibbutz infants appear resistantly attached. Note that these responses may not reflect true insecurity. Instead, they are probably due to cultural differences in child-rearing practices. (Adapted from Sagi et al., 1995; van IJzendoorn & Kroonenberg, 1988; van IJzendoorn & Sagi-Schwartz, 2008.)

time in close physical contact with their babies and rarely leave them in others' care, so the Strange Situation probably induces greater stress in them than in infants who experience frequent maternal separations (Takahashi, 1990). Also, Japanese parents expect their babies to be quite upset during reunion in the Strange Situation. They view the attention-seeking that is part of resistant attachment as a normal indicator of infants' efforts to satisfy dependency and security needs (Rothbaum et al., 2000a, 2007). Likewise, infants in Israeli kibbutzim frequently show resistant attachment. For these babies, who can sense the fear of unfamiliar people that is pervasive in their communities (see page 406), the Strange Situation probably induces unusual distress (van IJzendoorn & Sagi, 1999). Despite these and other cultural variations, the secure pattern is still the most common attachment quality in all societies studied to date (van IJzendoorn & Sagi-Schwartz, 2008).

Factors That Affect Attachment Security

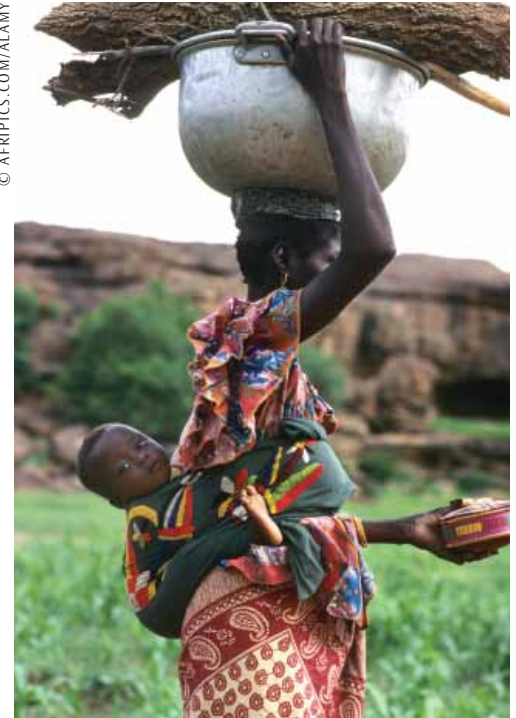
What factors might influence attachment security? Researchers have looked closely at four important influences: (1) early availability of a consistent caregiver, (2) quality of caregiving, (3) the baby's characteristics, and (4) family context, including parents' internal working models.

Early Availability of a Consistent Caregiver What happens when a baby does not have the opportunity to establish a close tie to a caregiver? In a series of studies, René Spitz (1946) observed institutionalized infants whose mothers had given them up between 3 and 12 months of age. After being placed in a large ward where each shared a nurse with at least seven others, the babies lost weight, wept, withdrew from their surroundings, and had difficulty sleeping. If a consistent caregiver did not replace the mother, the depression deepened rapidly. These institutionalized babies had emotional problems because they were prevented from forming a bond with one or a few adults (Rutter, 1996).

Another study supports this conclusion. Researchers followed the development of infants in an institution with a good caregiver–child ratio and a rich selection of books and toys. However, staff turnover was so rapid that the average child had 50 different caregivers by age 4½! Many of these children became “late adoptees” who were placed in homes after age 4. Most developed deep ties with their adoptive parents, indicating that a first attachment bond can develop as late as 4 to 6 years of age (Hodges & Tizard, 1989; Tizard & Rees, 1975). But these children were also more likely to display attachment difficulties, including an excessive desire for adult attention, “overfriendliness” to unfamiliar adults and peers, failure to check back with the parent in anxiety-arousing situations, and few friendships.

Children who spent their first year or more in deprived Eastern European orphanages—though also able to bond with their adoptive or foster parents—show elevated rates of attachment insecurity (van den Dries et al., 2009; Smyke et al., 2010). And they, too, are at high risk for emotional and social difficulties. Whereas many are indiscriminately friendly, others are sad, anxious, and withdrawn (Chisholm, 1998; Fisher et al., 1997; O'Connor et al., 2003). These symptoms typically persist and are associated with wide-ranging mental health problems in middle childhood and adolescence, including cognitive impairments, inattention and hyperactivity, depression, and either social avoidance or aggressive behavior (Kreppner et al., 2007, 2010; O'Connor et al., 2003; Rutter et al., 2007, 2010; Zeanah, 2000).

Furthermore, as early as 7 months, institutionalized children show reduced ERP brain waves in response to facial expressions of emotion and have trouble discriminating such expressions—outcomes that suggest disrupted formation of neural structures involved in “reading” emotions (Parker et al., 2005). These problems are still evident in preschoolers adopted during the second year, who find it hard to match appropriate facial expressions with situations in stories (Fries & Pollak, 2004). Consistent with these findings, MRI evidence reveals that in adopted children with longer institutional stays, the volume of the *amygdala*—a brain region devoted to processing emotional information (see page 190 in Chapter 5)—is atypically large (Tottenham et al., 2010). The larger amygdala, the worse adopted children perform on emotion-processing tasks and the poorer their emotion



Dogon mothers of Mali, West Africa, stay close to their babies and respond promptly and gently to infant hunger and distress. With their mothers consistently available, none of the Dogon babies show avoidant attachment.



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A father and baby engage in a sensitively tuned form of communication called interactional synchrony, in which they match emotional states, especially positive ones. Among Western infants, this style of communication predicts secure attachment.

regulation—deficits that contribute to their social-relationship and adjustment problems. Overall, the evidence on orphanage children indicates that fully normal emotional development depends on establishing a close tie with a caregiver early in life.

Quality of Caregiving Dozens of studies report that **sensitive caregiving**—responding promptly, consistently, and appropriately to infants and holding them tenderly and carefully—is moderately related to attachment security in both biological and adoptive mother–infant pairs and in diverse cultures and SES groups (Belsky & Fearon, 2008; DeWolff & van IJzendoorn, 1997; van IJzendoorn et al., 2004). In contrast, insecurely attached infants tend to have mothers who engage in less physical contact, handle them awkwardly or in a “routine” manner, and are sometimes resentful and rejecting, particularly in response to infant distress (Ainsworth et al., 1978; Isabella, 1993; McElwain & Booth-LaForce, 2006; Pederson & Moran, 1996).

Also, in studies of Western babies, a special form of communication called **interactional synchrony** separates the experiences of secure from insecure babies. It is best described as a sensitively tuned “emotional dance,” in which the caregiver responds to infant signals in a well-timed, rhythmic, appropriate fashion. In addition, both partners match emotional states, especially the positive ones (Bigelow et al., 2010; Isabella & Belsky, 1991; Nievar & Becker, 2008). Earlier we saw that sensitive face-to-face play, in which interactional synchrony occurs, increases babies’ sensitivity to others’ emotional messages and helps them regulate emotion. But moderate adult–infant coordination is a better predictor of attachment security than “tight” coordination, in which the adult responds to most infant cues (Jaffe et al., 2001). Perhaps warm, sensitive caregivers use a relaxed, flexible style of communication in which they comfortably accept and repair emotional mismatches, returning to a synchronous state.

Cultures vary in their view of sensitivity toward infants. Among the Gusii people of Kenya, for example, mothers rarely cuddle, hug, or interact playfully with their babies, although they are very responsive to their infants’ needs. Yet most Gusii infants appear securely attached (LeVine et al., 1994). This suggests that security depends on attentive caregiving, not necessarily on moment-by-moment contingent interaction. Puerto Rican mothers, who highly value obedience and socially appropriate behavior, often physically direct and limit their babies’ actions—a style of caregiving linked to attachment security in Puerto Rican culture (Carlson & Horwood, 2003). But in many Western cultures, such physical control and restriction of exploration are viewed as intrusive and predict insecurity (Belsky & Fearon, 2008; Whipple, Bernier, & Mageau, 2011).

Compared with securely attached infants, avoidant babies tend to receive overstimulating care. Their mothers might, for example, talk energetically to them while they are looking away or falling asleep. By avoiding the mother, these infants try to escape from overwhelming interaction. Resistant infants often experience inconsistent care: Their mothers are unresponsive to infant signals. Yet when the baby begins to explore, these mothers interfere, shifting the infant’s attention back to themselves. As a result, the baby is overly dependent as well as angry at the mother’s lack of involvement (Cassidy & Berlin, 1994; Isabella & Belsky, 1991).

Highly inadequate caregiving is a powerful predictor of disruptions in attachment. Child abuse and neglect (topics we will consider in Chapter 14) are associated with all three forms of attachment insecurity. Among maltreated infants, disorganized/disoriented attachment is especially high (van IJzendoorn, Schuengel, & Bakermans-Kranenburg, 1999). Persistently depressed mothers, mothers with very low marital satisfaction, and parents suffering from a traumatic event, such as serious illness or loss of a loved one, also tend to promote the uncertain behaviors of this pattern (Campbell et al., 2004; Madigan et al., 2006; Moss et al., 2005b). And some mothers of disorganized/disoriented infants engage in frightening, contradictory, and unpleasant behaviors, such as looking scared, teasing the baby, holding the baby stiffly at a distance, roughly pulling the baby by the arm, or seeking reassurance from the upset child (Abrams, Rifkin, & Hesse, 2006; Lyons-Ruth, Bronfman, & Parsons, 1999; Moran et al., 2008). Perhaps the baby’s disorganized behavior reflects a conflicted reaction to the parent, who sometimes comforts but at other times arouses fear.

Infant Characteristics Because attachment is the result of a *relationship* that builds between two partners, infant characteristics should affect how easily it is established. In Chapter 3, we saw that prematurity, birth complications, and newborn illness make caregiving more taxing. In families under stress, these difficulties are linked to attachment insecurity. In one study, the *combination* of preterm birth and maternal depression—but not preterm birth alone—increased the likelihood of insecure attachment at 12 months (Poehlmann & Fiese, 2001). Infants with special needs probably require greater sensitivity, which stressed parents often cannot provide. But at-risk newborns whose parents have the time and patience to care for them fare quite well in attachment security (Brisch et al., 2005; Cox, Hopkins, & Hans, 2000).

The role of infant temperament in attachment security has been intensely debated. Some researchers believe that infants who are irritable and fearful may simply react to brief separations with intense anxiety, regardless of the parent's sensitivity to the baby (Kagan, 1998; Kagan & Fox, 2006). Consistent with this view, emotionally reactive, difficult babies are more likely to develop later insecure attachments (van IJzendoorn et al., 2004; Vaughn, Bost, & van IJzendoorn, 2008).

Again, however, other evidence suggests that parental mental health and caregiving are involved. In a study extending from birth to age 2, difficult infants more often had highly anxious mothers—a combination that, by the second year, often resulted in a “disharmonious relationship” characterized by both maternal insensitivity and attachment insecurity (Symons, 2001). Infant difficultness and maternal anxiety seemed to perpetuate each other, impairing caregiving and the security of the parent–infant bond.

Other research focusing on disorganized/disoriented attachment has uncovered gene–environment interactions (Gervai, 2009). In one of these investigations, mothers' experience of unresolved loss of a loved one or other trauma was associated with attachment disorganization only in infants with a chromosome-11 gene having a certain repetition of DNA base pairs (called DRD4 7-repeat), which is linked to deficient self-regulation (see Figure 10.6) (van IJzendoorn & Bakermans-Kranenburg, 2006). Babies with this genetic marker, who face special challenges in managing intense emotion, were more vulnerable to the negative impact of maternal adjustment problems.

If children's temperaments alone determined attachment security, we would expect attachment, like temperament, to be at least moderately heritable. Yet twin comparisons reveal that the heritability of attachment is virtually nil (O'Connor & Croft, 2001; Roisman & Fraley, 2008). In fact, about two-thirds of siblings—whether identical twins, fraternal twins, nontwin siblings, unrelated siblings, or foster infants—establish similar attachment patterns with their parent, although the siblings often differ in temperament (Cole, 2006; Dozier et al., 2001). This suggests that the strongest parental influences on attachment security are *nonshared* experiences, reflecting most parents' efforts to adjust their caregiving to each child's individual needs.

A major reason that children's characteristics do not show strong relationships with attachment quality is that their influence depends on goodness of fit. From this perspective, *many* child attributes can lead to secure attachment as long as caregivers sensitively adjust their behavior to fit the baby's needs (Seifer & Schiller, 1995; Sroufe, 1985).

Interventions that teach parents to interact sensitively with difficult-to-care-for infants are highly successful in enhancing both quality of caregiving and attachment security (Velderman et al., 2006). One program that focused on both maternal sensitivity and effective discipline was particularly effective in reducing stress reactivity (as indicated by lower cortisol levels) and disruptive behavior among toddlers with the DRD4 7-repeat gene, who are at risk for later attention-deficit hyperactivity disorder and externalizing behavior problems (Bakermans-Kranenburg et al., 2008a, 2008b; Bakermans-Kranenburg & van IJzendoorn, 2011). These findings suggest that the DRD4 7-repeat gene makes children more susceptible to the effects of both negative and positive parenting!

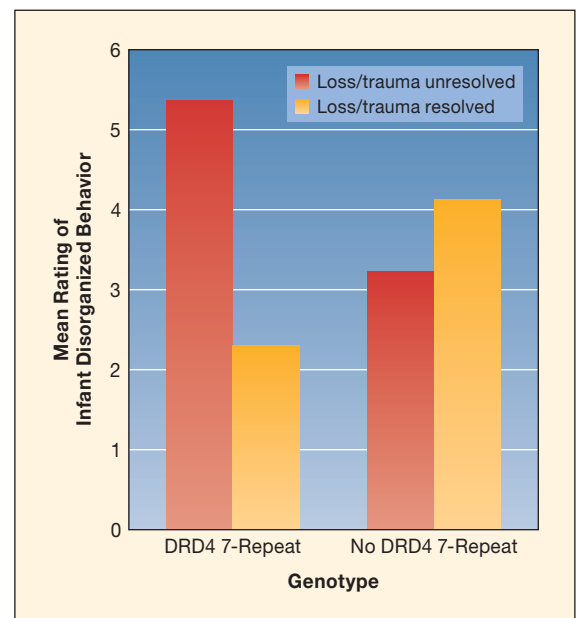


FIGURE 10.6 The combination of maternal unresolved loss/trauma and infant DRD4 7-repeat gene predicts disorganized/disoriented attachment. Mothers' experience of unresolved loss or other trauma was associated with disorganized/disoriented attachment only in 1-year-olds with the DRD4 7-repeat gene. (A rating of disorganized behavior in the Strange Situation higher than 5 leads to the attachment classification of disorganized/disoriented.) (Adapted from van IJzendoorn & Bakermans-Kranenburg, 2006.)



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Family circumstances are linked to attachment quality. Observing her parents' heated quarrels may undermine this child's sense of emotional security.

Family Circumstances As we have indicated in this and previous chapters, quality of caregiving can be fully understood only in terms of the larger context of the parent–child relationship. Job loss, a failing marriage, financial strain, and other stressors can undermine attachment indirectly, by interfering with the sensitivity of parental care. These stressors can also affect babies' sense of security directly by altering the emotional climate of the family (for example, exposing them to angry adult interactions) or by disrupting familiar daily routines (Finger et al., 2009; Raikes & Thompson, 2005).

The arrival of a new sibling illustrates how family circumstances can affect attachment quality. In one study, firstborn preschoolers who declined in attachment security after the birth of a baby had mothers who were depressed, anxious, or hostile before the birth. These symptoms were associated with marital friction (which the firstborns probably sensed) as well as with unfavorable mother–firstborn interaction. When mothers had cooperative marriages, coped well with the second birth, and stayed involved with their older child, preschoolers maintained a secure attachment bond (Teti et al., 1996). The availability of social supports, especially parents with a good relationship who assist each other with caregiving, reduces family stress and predicts greater attachment security (Belsky, 2006; Owen & Cox, 1997).

Parents' Internal Working Models Parents bring to the family context their own history of attachment experiences, from which they construct internal working models that they apply to the bonds they establish with their babies. To assess parents' "state of mind" with respect to attachment, Mary Main and her colleagues devised the *Adult Attachment Interview*, which asks adults to evaluate childhood memories of attachment experiences (Main & Goldwyn, 1998).

As Table 10.3 shows, quality of parents' working models is clearly related to children's attachment security in infancy and early childhood—results replicated in Canada, Germany, Great Britain, Japan, the Netherlands, and the United States. Parents who discuss their childhoods with objectivity and balance tend to have securely attached children. In contrast, parents who dismiss the importance of early relationships or describe them in angry, confused

TABLE 10.3 Relationship of Parents' Internal Working Models to Infant Attachment Security

TYPE OF INTERNAL WORKING MODEL	DESCRIPTION	INFANT ATTACHMENT CLASSIFICATION ^a
Autonomous/secure	These parents show objectivity and balance in discussing their childhood experiences, whether these were positive or negative. They neither idealize their parents nor feel angry about the past. Their explanations are coherent and believable. About 58 percent of North American mothers and fathers without psychological disturbance are autonomous/secure.	Secure
Dismissing	These parents devalue the importance of their attachment relationships. They tend to idealize their parents without being able to recall specific experiences. What they do recall is discussed intellectually, with little emotion. About 23 percent of North American mothers and 28 percent of fathers without psychological disturbance are dismissing.	Avoidant
Preoccupied	These parents talk about their childhood experiences with highly charged emotion, sometimes expressing anger toward their parents. They appear overwhelmed and confused about their early attachments and cannot discuss them coherently. About 19 percent of North American mothers and 15 percent of fathers without psychological disturbance are preoccupied.	Resistant
Unresolved	These parents show characteristics of any of the three other patterns. At the same time, they reason in a disorganized and confused way when loss of a loved one or experiences of physical or sexual abuse are discussed. Besides displaying one of the other patterns, about 18 percent of North American mothers and 15 percent of fathers without psychological disturbance are unresolved.	Disorganized/disoriented

^a Correspondences between type of maternal working model and infant attachment classification hold for 60 to 70 percent of mother–infant pairs.

Source: Bakermans-Kranenburg & van IJzendoorn, 2009; Bretherton & Munholland, 2008.

ways usually have insecurely attached children (Behrens, Hesse, & Main, 2007; Steele, Steele, & Fonagy, 1996; van IJzendoorn, 1995). Caregiving behavior helps explain these associations. Parents with autonomous/secure representations are warmer and more sensitive with their babies. They are also more likely to be supportive and to encourage learning and mastery in their preschoolers, who, in turn, are more affectionate and comfortably interactive with them (Coyl, Newland, & Freeman, 2010; Pederson et al., 1998; Slade et al., 1999).

But we must not assume any direct transfer of parents' childhood experiences to quality of attachment with their own children. Internal working models are *reconstructed memories* affected by many factors, including relationship experiences over the life course, personality, and current life satisfaction. Longitudinal research reveals that negative life events can weaken the link between an individual's own attachment security in infancy and a secure internal working model in adulthood. And insecurely attached babies who become adults with insecure internal working models often have lives that, based on adulthood self-reports, are filled with family crises (Waters et al., 2000; Weinfield, Sroufe, & Egeland, 2000).

In sum, our early rearing experiences do not destine us to become either sensitive or insensitive parents. Rather, the way we *view* our childhoods—our ability to come to terms with negative events, to integrate new information into our working models, and to look back on our own parents in an understanding, forgiving way—appears to be much more influential in how we rear our children than the actual history of care we received (Bretherton & Munholland, 2008).

Multiple Attachments

As we have indicated, babies develop attachments to a variety of familiar people—not just mothers but also fathers, grandparents, siblings, and professional caregivers. Although Bowlby (1969) believed that infants are predisposed to direct their attachment behaviors to a single special person, especially when they are distressed, his theory allowed for these multiple attachments.

Fathers An anxious, unhappy 1-year-old who is permitted to choose between the mother and the father as a source of comfort and security will usually choose the mother. But this preference typically declines over the second year. And when babies are not distressed, they approach, vocalize to, and smile equally often at both parents, who in turn are equally responsive to their infant's social bids (Bornstein, 2006; Parke, 2002).

Fathers' sensitive caregiving and interactional synchrony with infants, like mothers', predict attachment security (Lundy, 2003; van IJzendoorn et al., 2004). But as infancy progresses, mothers and fathers in many cultures, including Australia, Canada, Germany, India, Israel, Italy, Japan, and the United States, tend to interact differently with their babies: Mothers devote more time to physical care and expressing affection, fathers to playful interaction (Freeman & Newland, 2010; Roopnarine et al., 1990).

Mothers and fathers also play differently. Mothers more often provide toys, talk to infants, and gently play conventional games like pat-a-cake and peekaboo. In contrast, fathers—especially with their infant sons—tend to engage in highly arousing physical play with bursts of excitement and surprise that increase as play progresses (Feldman, 2003). As long as fathers are also sensitive, this stimulating, startling play style helps babies regulate emotion in intensely arousing situations and may prepare them to venture confidently into active, unpredictable contexts, including novel physical environments and play with peers (Cabrera et al., 2007; Hazen et al., 2010; Paquette, 2004). In a German study, fathers' sensitive, challenging play with preschoolers predicted favorable emotional and social adjustment from kindergarten to early adulthood (Grossmann et al., 2008).

Play is a vital context in which fathers build secure attachments (Newland, Coyl, & Freeman, 2008). It may be especially influential in cultures where long work hours prevent most fathers from sharing in infant caregiving, such as Japan (Hewlett, 2004; Shwalb et al., 2004). In many Western nations, however, a strict division of parental roles—mother as caregiver, father as playmate—has changed over the past several decades in response to women's workforce participation and to cultural valuing of gender equality.

LOOK and LISTEN

Observe parents at play with infants at home or a family gathering. Describe both similarities and differences in mothers' and fathers' behaviors. Are your observations consistent with research findings?

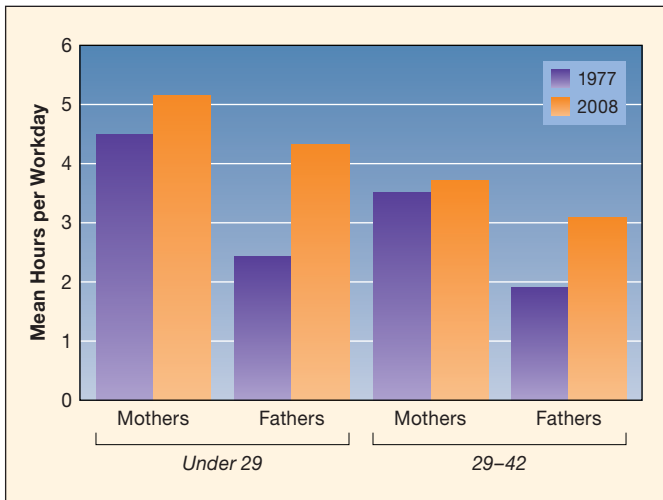


FIGURE 10.7 Average amount of time per workday U.S. employed mothers and fathers reported spending with their children (age 12 and younger) in 1977 and 2008. In national surveys of several thousand employed parents, mothers' time with children remained fairly stable from 1977 to 2008; fathers' time increased substantially. (Adapted from Galinsky, Aumann, & Bond, 2009.)

full-time (Cox et al., 1992). But fathers who are primary caregivers retain their arousing play style (Lamb & Oppenheim, 1989). These highly involved fathers are less gender-stereotyped in their beliefs; have sympathetic, friendly personalities; often had fathers who were more involved in rearing them; and regard parenthood as an especially enriching experience (Cabrera et al., 2000; Levy-Shiff & Israelashvili, 1988).

Fathers' involvement with babies occurs within a complex system of family attitudes and relationships. When both parents believe that men are capable of nurturing infants, fathers devote more time to caregiving (Beitel & Parke, 1998). A warm marital bond promotes both parents' sensitivity and involvement with babies, but it is particularly important for fathers (Lamb & Lewis, 2004). See the Cultural Influences box on the following page for cross-cultural evidence documenting this conclusion—and also highlighting the powerful role of paternal warmth in children's development.

Grandparent Primary Caregivers Nearly 2.4 million U.S. children—4 to 5 percent of the child population—live with their grandparents but apart from parents, in so-called *skipped-generation families* (U.S. Census Bureau, 2011). The number of grandparents rearing grandchildren has increased over the past two decades. The arrangement occurs in all ethnic groups, though more often in African-American, Hispanic, and Native-American families

than in Caucasian families. Although grandparent caregivers are more likely to be women than men, many grandfathers participate. Grandparents generally step in when parents' troubled lives—as a result of substance abuse, child abuse and neglect, domestic violence, mental illness, imprisonment, or adolescent parenthood—threaten children's well-being (Fuller-Thomson & Minkler, 2005, 2007; Minkler & Fuller-Thomson, 2005). Often these families take in two or more children.

As a result, grandparents tend to assume the parenting role under highly stressful life circumstances. Unfavorable child-rearing experiences have left their mark on children, who show high rates of learning difficulties, depression, and antisocial behavior. Absent parents' adjustment difficulties strain family relationships. Parents may interfere by violating the grandparents' behavioral limits, taking grandchildren away without permission, or making promises to children that they do not keep. These youngsters also introduce financial burdens into households that often are already low-income (Mills, Gomez-Smith, & De Leon, 2005; Williamson, Softas-Nall, & Miller, 2003). And grandparent caregivers, at a time when they anticipated having more time for spouses, friends, and leisure, instead have less. Many report feeling emotionally drained, depressed, and worried about what will happen to the children if their own health fails (Hayslip et al., 2002; Kolomer & McCallion, 2005).



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Despite stressful family conditions, grandparents who provide long-term physical and emotional care form deep attachments with their grandchildren.

CULTURAL INFLUENCES

The Powerful Role of Paternal Warmth in Development

Research in diverse cultures demonstrates that fathers' warmth contributes to children's long-term favorable development. In studies of many societies and ethnic groups around the world, researchers coded paternal expressions of love and nurturance—evident in such behaviors as cuddling, hugging, comforting, playing, verbally expressing love, and praising the child's behavior. Fathers' sustained affectionate involvement predicted later cognitive, emotional, and social competence as strongly as did mothers' warmth—and occasionally more strongly (Rohner & Veneziano, 2001; Veneziano, 2003). And in Western cultures, paternal warmth and secure attachment are associated with children's mature social behavior and a reduction in a wide range of difficulties, including childhood emotional and behavior problems and adolescent substance abuse and delinquency (Grant et al., 2000; Michiels et al., 2010; Nelson & Coyne, 2009; Tacon & Caldera, 2001).

Fathers who devote little time to physical caregiving express warmth through play. In a German study, fathers' play sensitivity—accepting toddlers' play initiatives, adapting play behaviors to toddlers' capacities, and responding appropriately to toddlers' expressions of emotion—predicted children's secure internal working models of attachment during middle childhood and adolescence (Grossmann et al., 2002). Through

play, fathers seemed to transfer to young children a sense of confidence about parental support, which may strengthen their capacity to master many later challenges.

What factors promote paternal warmth? Cross-cultural research reveals a consistent relationship between the amount of time fathers spend near infants and toddlers and their expressions of caring and affection (Rohner & Veneziano, 2001). Consider the Aka hunters and gatherers of Central Africa, where fathers spend more time in physical proximity to their babies than in any other known society. Observations reveal that Aka fathers are within arm's reach of infants more than half the day. They pick up, cuddle, and play with their babies at least five times as often as fathers in other hunting-and-gathering societies. Why are Aka fathers so involved? The bond between Aka husband and wife is unusually cooperative and intimate. Throughout the day, couples share hunting, food preparation, and social and leisure activities. The more time Aka parents are together, the greater the father's loving interaction with his baby (Hewlett, 1992).

In Western cultures as well, happily married fathers whose partners cooperate with them in parenting spend more time with and interact more effectively with infants. In contrast, marital dissatisfaction is associated with insensitive

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In diverse cultures, fathers' warmth predicts long-term favorable cognitive, emotional, and social development.

paternal care (Brown et al., 2010; Lundy, 2002; Seigny & Loutzenhiser, 2010). Clearly, fathers' warm relationships with their partners and their babies are closely linked. Evidence for the power of fathers' affection, reported in virtually every culture and ethnic group studied, is reason to encourage more men to engage in nurturing care of young children.

Nevertheless, because they provide physical and emotional care for an extended time and are invested in the child's well-being, grandparent caregivers forge significant attachment relationships with their grandchildren (Poehlmann, 2003). Warm grandparent–grandchild bonds help protect children from worsening adjustment problems, even under conditions of great hardship. Interviews reveal that children often feel loved, cared for, and optimistic about their futures (Hicks & Goedereis, 2009; Sands, Goldberg-Glen, & Shin, 2009). Still, grandparent caregivers have a tremendous need for social and financial support and intervention services for their at-risk grandchildren.

Attachment and Later Development

According to psychoanalytic and ethological theories, the inner feelings of affection and security that result from a healthy attachment relationship support all aspects of psychological development. Consistent with this view, an extended longitudinal study by Alan Sroufe and his collaborators found that preschoolers who were securely attached as babies were rated by their teachers as higher in self-esteem, social skills, and empathy than were their insecurely attached counterparts, who displayed more behavior problems. When studied again at age 11 in summer camp, children who had been secure infants had more favorable relationships with peers, closer friendships, and better social skills, as judged by camp

counselors. And as these well-functioning school-age children became adolescents and young adults, they continued to benefit from more supportive social networks, formed more stable and gratifying romantic relationships, and attained higher levels of education (Elicker, Englund, & Sroufe, 1992; Sroufe, 2002; Sroufe et al., 2005).

For some researchers, these findings seem to indicate that secure attachment in infancy causes improved cognitive, emotional, and social competence in later years. Yet contrary evidence exists. In other longitudinal studies, secure infants generally fared better than inse-



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Parental sensitivity—not just in infancy but throughout childhood—likely contributed to these teenagers' social confidence and capacity for friendship.

secure infants, but not always (Fearon et al., 2010; McCartney et al., 2004; Schneider, Atkinson, & Tardif, 2001; Stams, Juffer, & van IJzendoorn, 2002). Disorganized/disoriented attachment, however, is an exception: It is consistently related to internalizing problems (fear and anxiety) and externalizing problems (anger and aggression) during the preschool and school years. Disorganized children also show inappropriate role reversals: In an apparent effort to compensate for their parent's confused communication, they use either exaggerated comforting or hostility to try to control the parent's behavior (Lyons-Ruth, 1996; Lyons-Ruth, Easterbrooks, & Cibelli, 1997; Moss et al., 2004, 2006; Moss, Cyr, & Dubois-Comtois, 2004).

What accounts for the inconsistency in research findings on the consequences of early attachment quality? Mounting evidence indicates that *continuity of caregiving* determines whether attachment security is linked to later development (Lamb et al., 1985; Thompson, 2006). Children whose parents respond sensitively not just in infancy but also in later years are likely to develop favorably. In contrast, children whose parents react insensitively or who, over a long period, are exposed to a negative family climate tend to establish lasting patterns of avoidant, resistant, or disorganized behavior and are at greater risk for developmental difficulties.

A close look at the relationship between parenting and children's adjustment in the first few years supports this interpretation. Recall that parents of disorganized/disoriented infants tend to have serious psychological problems or engage in highly maladaptive caregiving—conditions that usually persist and that are strongly linked to poor adjustment in children (Lyons-Ruth, Bronfman, & Parsons, 1999). And when more than 1,000 children were tracked from age 1 to 3 years, those with histories of secure attachment followed by sensitive parenting scored highest in cognitive, emotional, and social outcomes. Those with histories of insecure attachment followed by insensitive parenting scored lowest, while those with mixed histories of attachment and maternal sensitivity scored in between (Belsky & Fearon, 2002). Specifically, insecurely attached infants whose mothers became more positive and supportive in early childhood showed signs of developmental recovery.

Does this trend remind you of our discussion of *resilience* in Chapter 1? A child whose parental caregiving improves or who has other compensating affectionate ties outside the immediate family can bounce back from adversity. In contrast, a child who experiences tender care in infancy but lacks sympathetic ties later on is at risk for problems.

Turn back to the evidence on page 428, which indicates that as early as the second year, toddlers have formed attachment-related expectations about parental comfort and support. With cognitive development and continuing experiences with caregivers, this rudimentary internal working model expands into a broader, more complex representation. Recall from page 414 that parents of securely attached preschoolers converse with them in more elaborative ways, especially about emotion. Some researchers believe that these narratives facilitate children's construction of a coherent image of the self in relation to attachment figures (Fivush, 2006; Thompson 2008). Then, as children encounter new attachment-related experiences, they refine and “update” their internal working model.

Although a secure attachment in infancy does not guarantee continued good parenting, it does launch the parent–child relationship on a positive path that is likely to continue.

Much research shows that an early warm, positive parent–child tie, sustained over time, promotes many aspects of children’s development: a more confident and complex self-concept, more advanced emotional understanding, stronger emotional self-regulation, more favorable relationships with teachers and peers, more effective social skills, a stronger sense of moral responsibility, and higher motivation to achieve in school (Thompson, 2006, 2008). But the effects of early attachment security are *conditional*—dependent on the quality of the child’s future relationships. Finally, as our discussion has already revealed and as you will see again in future chapters, attachment is just one of the complex influences on children’s psychological development.

ASK YOURSELF

Review ■ What factors explain stability in attachment pattern for some children and change for others? Are these factors also involved in the link between attachment in infancy and later development? Explain.

Connect ■ Review research on emotional self-regulation on page 408. How do the caregiving experiences of securely attached infants promote the development of emotional self-regulation?

Apply ■ In evaluating her childhood attachment experiences, Monica recalls her mother as tense and distant. Is Monica’s new-born daughter likely to develop an insecure attachment? Explain, using research on adults’ internal working models.

Reflect ■ How would you characterize your internal working model? What factors, in addition to your early relationship with your parents, might have influenced it?

Attachment, Parental Employment, and Child Care

Over the past three decades, women have entered the labor force in record numbers. Today, more than 60 percent of U.S. mothers with a child under age 2 are employed (U.S. Census Bureau, 2011). In response to this trend, researchers and laypeople alike have raised questions about the impact on the attachment bond of child care and daily separations of infant from parent.

The Social Issues: Health box on page 440 reviews the current controversy over whether child care threatens young children’s development. As you will see, the weight of evidence suggests that *quality of care* is crucially important. Infants and young children exposed to long hours of mediocre to poor nonparental care, regardless of whether they come from middle- or low-SES homes, score lower on measures of cognitive and social skills (Belsky et al., 2007; Hausfather et al., 1997; NICHD Early Child Care Research Network, 2000b, 2001a, 2003b, 2006). In contrast, good child care can reduce the negative impact of a stressed, poverty-stricken home life, and it sustains the benefits of growing up in an economically advantaged family (Lamb & Ahnert, 2006; McCartney et al., 2007; NICHD Early Child Care Research Network, 2003b).

TAKE A MOMENT... Visit several child-care settings, and take notes on what you see. In contrast to most European countries and to Australia and New Zealand, where child care is nationally regulated and funded to ensure its quality, reports on U.S. child care raise serious concerns. Standards are set by the individual states and vary widely. In studies of quality, only 20 to 25 percent of child-care centers and family child-care settings (in which a caregiver cares for children in her home) provided infants and toddlers with sufficiently positive, stimulating experiences to promote healthy psychological development. Most settings offered substandard care (NICHD Early Child Care Research Network, 2000a, 2004c).

Unfortunately, many U.S. children from low-income families experience inadequate child care (Brooks-Gunn, 2004). But U.S. settings providing the very worst care tend to serve middle-SES families. These parents are especially likely to place their children in for-profit centers, where quality tends to be lowest. Low-SES children more often attend publicly subsidized, nonprofit centers, which have smaller group sizes and better teacher–child ratios (Lamb & Ahnert, 2006). Still, child-care quality for low-SES children varies widely.

- Discuss the implications of parental employment and child care for attachment security and early psychological development.

SOCIAL ISSUES: HEALTH

Does Child Care Threaten Infant Attachment Security and Later Adjustment?

Are infants who experience daily separations from their employed parents and early placement in child care at risk for attachment insecurity and developmental problems? Some researchers think so, but others disagree. Let's look closely at the evidence.

Attachment Quality

Some studies suggest that babies placed in full-time child care before 12 months of age are more likely to display insecure attachment in the Strange Situation (Belsky, 2001, 2005). But the best current evidence—from the U.S. National Institute of Child Health and Development (NICHD) Study of Early Child Care, the largest longitudinal investigation to date, including more than 1,300 infants and their families—confirms that use of nonparental care by itself does not affect attachment quality (NICHD Early Child Care Research Network, 1997, 2001b). Rather, the relationship between child care and emotional well-being depends on both family and child-care experiences.

Family Circumstances

We have seen that family conditions affect children's attachment security and later adjustment. Findings of the NICHD Study confirmed that parenting quality, assessed using a combination of maternal sensitivity and HOME scores (see page 344 in Chapter 8), exerted a more powerful impact on children's adjustment than did exposure to child care (NICHD Early Childhood Research Network, 1998; Watamura et al., 2011).

For employed parents, balancing work and caregiving can be stressful. Mothers who are fatigued and anxious because they feel overloaded by work and family pressures may respond less sensitively to their babies, thereby risking the infant's security. And as paternal involvement in caregiving has risen (see page 436), many more U.S. fathers in dual-earner families also report work–family-life conflict (Galinsky, Aumann, & Bond, 2009).

Quality and Extent of Child Care

Nevertheless, poor-quality child care may contribute to a higher rate of insecure attachment. In the NICHD Study, when babies were exposed to combined home and child-care risk factors—insensitive caregiving at home along with insensitive caregiving in child care, long hours in child care, or more than one child-care arrangement—the rate of attachment insecurity increased. Overall, mother–child interaction was more favorable when children attended higher-quality child care and also spent fewer hours in

child care (NICHD Early Child Care Research Network, 1997, 1999).

Furthermore, when children reached age 3, a history of higher-quality child care predicted better social skills (NICHD Early Child Care Research Network, 2002b). However, at age 4½ to 5, children averaging more than 30 child-care hours per week displayed more behavior problems, especially defiance, disobedience, and aggression. For those who had been in child-care centers as opposed to family child-care homes, this outcome persisted through elementary school (Belsky et al., 2007; NICHD Early Child Care Research Network, 2003a, 2006).

But these findings do not necessarily mean that child care causes behavior problems. Rather, heavy exposure to substandard care, which is widespread in the United States, may promote these difficulties, especially when combined with family risk factors. A closer look at NICHD participants during the preschool years revealed that those in both poor-quality home and child-care environments fared worst in social skills and problem behaviors, whereas those in both high-quality home and child care environments fared best. In between were preschoolers in high-quality child care but poor-quality homes (Watamura et al., 2011). These children benefited from the *protective influence* of high-quality child care.

Evidence from other industrialized nations confirms that full-time child care need not harm children's development. In Australia, for example, infants who spend full days in government-funded, high-quality child-care centers have a higher rate of secure attachment than infants informally cared for by relatives, friends, or babysitters. And amount of time in child care is unrelated to Australian preschoolers' behavior problems (Love et al., 2003).

Still, some children may be particularly stressed by long child-care hours. Many infants, toddlers, and preschoolers attending child-care centers for full days show a mild increase in saliva concentrations of cortisol across the day—a pattern that does not occur on days they spend at home. In one study, children rated as highly fearful by their caregivers experienced an especially sharp increase in cortisol levels (Watamura et al., 2003). Inhibited children may find the constant company of large numbers of peers particularly stressful.

Conclusions

Taken together, research suggests that some infants may be at risk for attachment insecurity and later adjustment problems due to inadequate

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High-quality child care, with generous caregiver–child ratios, small group sizes, and knowledgeable caregivers, can be part of a system that promotes all aspects of child development, including attachment security.

child care, long hours in such care, and the joint pressures their parents experience from full-time employment and parenthood. But it is inappropriate to use these findings to justify a reduction in child-care services. When family incomes are limited or mothers who want to work are forced to stay at home, children's emotional security is not promoted.

Instead, it makes sense to increase the availability of high-quality child care and to relieve work–family-life conflict by providing parents with paid employment leave (see page 119 in Chapter 3) and opportunities for part-time work. In the NICHD study, part-time (as opposed to full-time) employment during the baby's first year was associated with greater maternal sensitivity and a higher-quality home environment, which yielded more favorable development in early childhood (Brooks-Gunn, Han, & Waldfogel, 2010).

Finally, for child care to foster attachment security, the professional caregiver's relationship with the baby is vital. When caregiver–child ratios are generous, group sizes are small, and caregivers are educated about child development and child rearing, caregivers' interactions are more positive and children develop more favorably—cognitively, emotionally, and socially (McCartney et al., 2007; NICHD Early Child Care Research Network, 2000a, 2002a, 2006). Child care with these characteristics can become part of an ecological system that relieves parental and child stress, thereby promoting healthy attachment and development.

APPLYING WHAT WE KNOW

Signs of Developmentally Appropriate Infant and Toddler Child Care

PROGRAM CHARACTERISTIC	SIGNS OF QUALITY
Physical setting	Indoor environment is clean, in good repair, well-lighted, and well-ventilated. Fenced outdoor play space is available. Setting does not appear overcrowded when children are present.
Toys and equipment	Play materials are appropriate for infants and toddlers and are stored on low shelves within easy reach. Cribs, highchairs, infant seats, and child-sized tables and chairs are available. Outdoor equipment includes small riding toys, swings, slide, and sandbox.
Caregiver–child ratio	In child-care centers, caregiver–child ratio is no greater than 1 to 3 for infants and 1 to 6 for toddlers. Group size (number of children in one room) is no greater than 6 infants with 2 caregivers and 12 toddlers with 2 caregivers. In family child care, caregiver is responsible for no more than 6 children; within this group, no more than 2 are infants and toddlers. Staffing is consistent, so infants and toddlers can form relationships with particular caregivers.
Daily activities	Daily schedule includes times for active play, quiet play, naps, snacks, and meals. It is flexible rather than rigid, to meet the needs of individual children. Atmosphere is warm and supportive, and children are never left unsupervised.
Interactions among adults and children	Caregivers respond promptly to infants' and toddlers' distress; hold, talk to, sing to, and read to them; and interact with them in a manner that respects the individual child's interests and tolerance for stimulation.
Caregiver qualifications	Caregiver has some training in child development, first aid, and safety.
Relationships with parents	Parents are welcome anytime. Caregivers talk frequently with parents about children's behavior and development.
Licensing and accreditation	Child-care setting, whether a center or a home, is licensed by the state. Voluntary accreditation by the National Academy of Early Childhood Programs (www.naeyc.org/accreditation), or the National Association for Family Child Care (www.nafcc.org) is evidence of an especially high-quality program.

Source: Copple & Bredekamp, 2009.

See Applying What We Know above for signs of high-quality child care for infants and toddlers, based on standards for **developmentally appropriate practice**. These standards, devised by the U.S. National Association for the Education of Young Children, specify program characteristics that meet the developmental and individual needs of young children, based on both current research and consensus among experts. When child care meets standards for developmentally appropriate practice, children's learning opportunities and the warmth, sensitivity, and stability of their caregivers are especially high.

Child care in the United States is affected by a macrosystem of individualistic values and weak government regulation and funding. Furthermore, many parents think that their children's child-care experiences are higher in quality than they really are. Unable to identify good care, they do not demand it (Helburn, 1995). In recent years, recognizing that child care is in a state of crisis, the U.S. federal government and some states have allocated additional funds to subsidize its cost, primarily for low-income families. Though far from meeting the need, this increase in resources has had a positive impact on child-care quality and accessibility (Children's Defense Fund, 2009).

Good child care is a cost-effective means of supporting the development of all children. For children whose development is at risk, it can serve as effective early intervention, much like the programs we discussed in Chapter 8. We will revisit the topics of parental employment and child care in Chapter 14, when we focus on their consequences for development during childhood and adolescence.

A S K Y O U R S E L F

Review ■ Cite evidence that high-quality infant and toddler child care supports development, whereas poor-quality care undermines it.

Apply ■ Randi and Mike are worried that placing their 6-month-old baby, Lucinda, in child care may disrupt Lucinda's sense of security. List steps that Randi and Mike can take to ensure that Lucinda's experiences—at home and in child care—support her emotional and social development.

S U M M A R Y

Functions of Emotions (p. 399)

Describe the functionalist approach to emotional development.

- The **functionalist approach** emphasizes that the broad function of **emotions** is to energize behavior aimed at attaining personal goals. Emotions are central in cognitive processing, social behavior, and physical health. Emotions also contribute to the emergence of self-awareness, which makes possible new, self-evaluative emotions. Gradually, children gain voluntary control over their emotions.

Development of Emotional Expression (p. 403)

How does the expression of basic emotions change during infancy?

- During the first six months, **basic emotions** gradually become clear, well-organized signals. The **social smile** appears between 6 and 10 weeks, laughter around 3 to 4 months. Happiness strengthens the parent-child bond and reflects and promotes motor and cognitive mastery.



- Anger and fear (especially in the form of **stranger anxiety**) increase from the second half of the first year into the second year, as infants' cognitive and motor capacities improve. Newly mobile babies use the familiar caregiver as a **secure base** from which to explore.

Describe the development of self-conscious emotions, emotional self-regulation, and conformity to emotional display rules.

- During toddlerhood, self-awareness and adult instruction provide the foundation for **self-conscious emotions**: guilt, shame, embarrassment, envy, and pride. With age, these emotions become more internally governed.
- **Emotional self-regulation** emerges as the prefrontal cortex develops and as caregivers sensitively assist infants in adjusting their emotional reactions. With motor, cognitive, and language development and warm parental guidance, children acquire more effective self-regulatory strategies. Children who experience negative emotion intensely find it harder to inhibit feelings and shift attention away from disturbing events.
- By age 10, most children can shift adaptively between **problem-centered** and **emotion-centered coping** in regulating emotion. Emotionally well-regulated children are optimistic and cooperative and have positive relationships with teachers and peers.
- Young preschoolers start to conform to their culture's **emotional display rules**. From infancy on, parents encourage children—especially boys—to suppress negative emotion. In middle childhood, children understand the value of display rules in ensuring social harmony.

Understanding and Responding to the Emotions of Others (p. 412)

Describe the development of emotional understanding from infancy through middle childhood.

- Around the middle of the first year, infants respond to emotional expressions as organized, meaningful wholes. Beginning at 8 to 10 months, they engage in **social referencing**, seeking emotional information from caregivers in uncertain situations. By the middle of the second year, toddlers realize that others' emotional reactions may differ from their own.

- Preschoolers understand many causes, consequences, and behavioral signs of emotion. The capacity to consider conflicting cues when explaining others' feelings improves in middle childhood, along with an appreciation of mixed emotions. Warm parental conversations about emotions and interactions with siblings and friends, especially make-believe play, are excellent contexts for learning about emotions.

Describe the development of empathy from infancy into adolescence, noting individual differences.

- As toddlers develop self-awareness, they begin to empathize. During childhood and adolescence, gains in language, emotional understanding, and perspective taking support an increase in **empathy**, which motivates **prosocial**, or **altruistic**, behavior.
- Children who are sociable, assertive, and good at regulating emotion are more likely than poor emotion regulators to move from empathy to sympathetic, prosocial behavior. Warm parents who encourage emotional expressiveness, show empathic concern, and help their child regulate angry feelings promote development of empathy and sympathy. Angry, punitive parenting disrupts these capacities.

Temperament and Development (p. 416)

What is temperament, and how is it measured?

- Children vary widely in **temperament**—early-appearing, stable individual differences in reactivity and self-regulation. The New York Longitudinal Study identified three patterns: the **easy child**, the **difficult child**, and the **slow-to-warm-up child**. The most influential model of temperament, devised by Rothbart, includes dimensions representing emotion, attention, and action, along with **effortful control**, the ability to regulate one's reactivity.
- Temperament is assessed through parental reports, behavior ratings by others familiar with the child, and laboratory observations. Most neurobiological research has focused on distinguishing **inhibited**, or **shy**, children from **uninhibited**, or **sociable**, children.

Discuss the roles of heredity and environment in the stability of temperament, the relationship of temperament to cognitive and social functioning, and the goodness-of-fit model.

- Long-term prediction from early temperament is best achieved after age 3, when styles of responding are better established. Although temperament is moderately heritable, both shared environmental influences and non-shared influences—evident in parents' tendency to emphasize each child's unique qualities—contribute.
- Children's temperamental traits consistently predict their cognitive and social functioning. Effortful control is linked to generally favorable development and adjustment.
- The **goodness-of-fit model** describes how a child's temperament and environment work together to affect later development. Parenting practices that fit well with the child's temperament help children achieve more adaptive functioning.

Development of Attachment (p. 426)

What are the unique features of ethological theory of attachment?

- The most widely accepted perspective on development of **attachment**—our strong affectionate tie with special people in our lives—is **ethological theory**, which recognizes the infant's emotional tie to the caregiver as an evolved response that promotes survival.
- Around 6 to 8 months, **separation anxiety** and use of the parent as a secure base indicate the existence of a true attachment bond. Separation anxiety declines as representation and language develop, enabling preschoolers to better understand the parent's coming and going. From early caregiving experiences, children construct an **internal working model** that serves as a guide for all future close relationships.

Describe how researchers measure the security of attachment, and discuss the stability of attachment patterns.

- Researchers using the **Strange Situation** to measure the quality of attachment between ages 1 and 2 have identified four attachment patterns: **secure**, **avoidant**, **resistant**, and **disorganized/disoriented**. The **Attachment Q-Sort**, based on home observations of children between ages 1 and 4 years, yields a score ranging from high to low in security.
- Securely attached babies in middle-SES families with favorable life conditions more often maintain their attachment pattern than insecure babies. However, the disorganized/disoriented pattern is highly stable. Cultural conditions must be considered in interpreting the meaning of attachment patterns.
- Attachment security is influenced by early availability of a consistent caregiver, quality of caregiving, the fit between the baby's temperament and parenting practices, and family circumstances. **Sensitive caregiving** is moderately related to secure attachment. In Western cultures, **interactional synchrony** characterizes the experiences of securely attached babies.

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- Parents' internal working models are good predictors of children's attachment security, but parents' childhood experiences do not transfer directly to quality of attachment with their own children.

Discuss infants' formation of multiple attachments and the role of early attachment quality in later development.

- Infants develop strong affectionate ties to fathers, who tend to engage in more exciting, physical play with babies than do mothers. Sensitive, stimulating play is a vital context in which fathers and babies build secure attachments, predicting favorable emotional and social adjustment.
- Grandparents who serve as primary caregivers for grandchildren in skipped-generation families forge significant attachment ties that help protect children with troubled family lives from adjustment problems.
- Secure attachment in infancy launches the parent-child relationship on a positive path. But continuity of caregiving determines whether attachment security is linked to later development. If caregiving improves, children can recover from an insecure attachment history.

Attachment, Parental Employment, and Child Care (p. 439)

Discuss the implications of parental employment and child care for attachment security and early psychological development.

- Research indicates that quality of care is crucially important. Spending many hours in mediocre to poor-quality child care, especially when combined with family risk factors, predicts insecure attachment and less favorable cognitive, emotional, and social development.
- When child-care settings meet professionally accepted standards for **developmentally appropriate practice**, children's learning opportunities and the warmth, sensitivity, and stability of their caregivers are especially high. Good child care can also serve as effective early intervention for children whose development is at risk.

IMPORTANT TERMS AND CONCEPTS

attachment (p. 426)
Attachment Q-Sort (p. 429)
avoidant attachment (p. 428)
basic emotions (p. 404)
developmentally appropriate practice (p. 441)
difficult child (p. 418)
disorganized/disoriented attachment (p. 429)
easy child (p. 418)
effortful control (p. 419)
emotion (p. 399)
emotion-centered coping (p. 410)
emotional display rules (p. 410)

emotional self-regulation (p. 407)
empathy (p. 414)
ethological theory of attachment (p. 426)
functionalist approach to emotion (p. 399)
goodness-of-fit model (p. 424)
inhibited, or shy, children (p. 419)
interactional synchrony (p. 432)
internal working model (p. 428)
problem-centered coping (p. 410)
prosocial, or altruistic, behavior (p. 415)
resistant attachment (p. 429)
secure attachment (p. 428)

secure base (p. 406)
self-conscious emotions (p. 406)
sensitive caregiving (p. 432)
separation anxiety (p. 427)
slow-to-warm-up child (p. 418)
social referencing (p. 412)
social smile (p. 404)
Strange Situation (p. 428)
stranger anxiety (p. 405)
sympathy (p. 415)
temperament (p. 416)
uninhibited, or sociable, children (p. 419)