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One day 4-month-old Mikey woke up early from his morning nap. Cooing contentedly to himself, he began kicking. The toys on his crib gym jangled, and he kicked more. Then he waved his arms and batted a bright red ring, gurgling happily as it bobbed in response. Christine arrived and stood by the crib, smiling down at the baby. Mikey’s face brightened. He broke into a broad grin and kicked his feet harder.

Eight months later, Uncle Dan was showing 12-month-old Mikey a new mechanical toy. When he released it, it made a loud clacking noise. Frightened, Mikey turned away and scurried to Christine, raising his arms to be picked up. In Christine’s arms he looked at the toy again and began smiling and pointing at it.

This chapter is about the beginnings of emotion and the emergence of infants’ attachment relationships with caregivers, usually parents. Such relationships are the culmination of all cognitive, social, and emotional development in the first year of life. Initially, babies are attracted to social encounters; human faces and voices engage their interest. With development, infants learn to sustain attention, to follow complex changes in others’ voices and faces, and to tolerate the excitement caused by social stimulation. Soon babies begin to go beyond reacting to others; the coordinated turn-taking of more advanced social interaction emerges. For example, when 6-month-old Mikey smiles and kicks his feet, his father or mother touches and talks to him. Mikey chortles and kicks again, and his parent smiles and touches him some more.

For Mikey to form a true attachment to Christine, he must learn to differentiate her from others. He must do more than simply recognize his mother; he must understand she is a specific, constant person. This understanding is related to the concept of object permanence discussed in Chapter 5, which emerges in the second six months of life. By the time Mikey is 8 or 10 months old, he will show he has developed this understanding by becoming distressed when Christine leaves him with someone unfamiliar. He will know his mother still exists when out of sight, and when distressed he will want her specifically. Given his involvement with Frank, Mikey will show many similar reactions with him.

As you learned in Chapter 5, during the second six months babies develop expectancies and purposefulness. Eight-month-olds are surprised when objects magically vanish, angry when intended actions are thwarted, and joyous when goals are achieved. Events and feelings are now intimately connected; perception, cognition, and emotion are integrated (Sroufe, 1995). Experiences are categorized partly by emotions associated with them. For example, a 10-month-old may react negatively to a doctor immediately upon sight, evaluating the doctor in terms of the feelings he or she generated at a recent visit, without waiting to see what will happen this time.

Attachments between infants and caregivers develop in the context of this differentiating emotional and social world. By the end of the first year, infants feel secure in the presence of their caregivers, turn to them purposefully when distressed (as Mikey did when frightened by the mechanical toy), and organize play and exploration around them. Caregivers take center stage in infants’ lives and provide the basis for their expectations about responsiveness of the environment.

In this chapter we trace babies’ emerging capacity for social relations from the first weeks of life. First we examine the developments of the first six months, when newborns develop into active social partners who can anticipate others’ actions, respond to social overtures, and purposefully direct social give-and-take. Next we consider developments in the second six months, when infants acquire specific attachments to caregivers, and how such relationships affect their growing capacities for emotional expression and regulation. Then we discuss individual differences in social and emotional development, including variations in the quality of attachment relationships and in individual temperament. Finally, we turn to the overall importance of early care and consider whether early experience has special significance for development.
Questions to Think about as You Read:

- How are infants’ growing social and emotional abilities related to changes in their perceptual, motor, and cognitive abilities?
- What can parents and other caregivers do to provide the best possible environment for early social and emotional development?

DEVELOPMENT IN THE FIRST SIX MONTHS

For decades researchers have probed the competencies of newborns. This research has produced two extreme views: one historical, the other recent. The historical view is associated with the nineteenth-century psychologist William James. James believed human infants were born with no perceptual or social skills whatsoever, that their world was meaningless and chaotic, a “blooming, buzzing confusion.” In direct opposition is the recent view that newborns are socially advanced and can imitate complex behaviors, infer others’ perspectives, and feel disappointment when social expectations aren’t met (Aitken and Trevathan, 1997; Meltzoff and Moore, 1989). In this view, even very young infants are seen as possessing desires, expectations, purpose, and will.

From a developmental perspective, neither view is satisfactory. The first is at odds with contemporary research. As discussed in Chapter 4, newborns have many competencies; their world is not meaningless confusion. The second view is a useful antidote to the first, but also runs counter to important findings. Because the brain’s cerebral cortex is not fully functional at birth, it is hard to imagine how newborns could possess expectations and purpose (Nelson, 1994; Saarni, Mumme, and Campos, 1998). Moreover, we need not assume newborns are socially competent in order to account for the things they soon become able to do. We need only assume that their capacities prepare them to become part of a social system under normal caregiving circumstances. (See the box on page 196.)

The Newborn as Preadapted to Social Exchanges

Newborns come equipped with certain predispositions that enable them to participate in early social exchanges, provided they receive responsive caregiving (Ainsworth and Bell, 1974; Fogel, 1993; Sander, 1975; Thompson, 1998). These predispositions, many of which were discussed in Chapter 4, preadapt newborns to become social. But this social potential will unfold only in a certain developmental context, much as the turning on of genes in certain cells depends on surrounding cells during prenatal development. If caregivers provide babies with appropriate stimulation and are responsive to their inborn reactions, then—and only then—coordinated social exchanges become possible and ultimately lead to genuine social partnerships (Schore, 1994).

One predisposition of newborns that preadapts them for social interaction is a built-in ability to signal psychological and physiological needs in ways adults can interpret and are likely to respond to. Even newborns can signal their needs by crying. Remember that babies cry whenever their nervous systems are overly excited. Newborns’ cries are purely reflexive, not intentional; young babies do not cry to be defiant or get their way. Nevertheless, their cries become social signals when caring adults respond by administering to their needs. This is a subtle but important point; a newborn’s behaviors serve the function of social communication only to the extent that others treat those behaviors as communications (Fogel, 1993).

Another predisposition of newborns that helps make early social exchanges possible is the capacity to detect contingencies in the environment. Infants notice events caused by their behaviors and repeat these behaviors (Dunham and Dunham, 1990; Papoušek, Papoušek, and Koester, 1986). Their behaviors often produce reactions from their caregivers, such as
NEWBORN PRECOCITY

Parents and some researchers often attribute very advanced capacities to newborns. These capacities include the ability to understand emotional reactions or goals of others, a desire to share, and even the capacity for disappointment when social expectations are violated. Given the lack of development of the cerebral cortex, as discussed in Chapter 4, such capacities seem unlikely. How, then, can we explain what appear to be amazingly precocious social and emotional capacities in young infants? Usually, a simpler answer can be found in infants' more basic cognitive and perceptual capacities.

Example 1: A researcher slowly turns her head and looks at a doll on the far right. A newborn facing the researcher turns the same way. Is this to share in what the researcher is seeing? More likely, the infant is simply tracking the horizontal movement of the researcher's face.

Example 2: Four-month-olds distinguish toothy smiling faces from sad faces. This seems like a remarkable ability to interpret facial expressions, but it turns out that babies this age don't discriminate sad faces from faces showing non-toothly smiles. It is not the emotional meaning, but the greater contrast of teeth that allows babies this age to distinguish between the two faces (Saarni et al., 1998).

Example 3: If a parent sits stone-faced and silent in front of a 4-month-old, after a time the child will begin to fuss or even cry hard. Does this reaction indicate the baby is feeling disappointment or experiencing a violation of social expectation about his or her parent's behavior? Perhaps, but more likely something simpler is going on, especially since a similar reaction can be elicited by an unresponsive stranger's face. In fact, in babies this age any situation that combines highly salient and familiar elements (such as the parent's face) with unfamiliar elements (such as the unresponsiveness) tends to produce a response of wariness escalating to distress after a few minutes (Sroufe, 1995).

By the end of the first year infants do have some remarkable social and emotional capacities (Thompson, 1998). They have beginning social expectations, preferences for particular people, the capacity to purposefully signal certain desires, and basic emotions such as surprise, anger, and fear. But they are not born with these capacities, and most are not yet present in early infancy. Instead, young infants produce responses that caregivers often interpret as social. Even though this interpretation is inaccurate, it turns out to be good for babies because it causes parents to try harder to engage them in interaction, which fosters their social and emotional development.

...getting mother to smile and talk by looking at her and cooing. A sensitivity to these contingencies preadapts infants to become part of a social system (Thompson, 1998).

Closely related to newborns' inclination to detect and respond to contingencies is a built-in attraction to social stimuli. As discussed in Chapter 4, newborns are naturally attentive to light/dark contrasts and to movement. Since faces have light/dark contrasts and adults tend to smile and nod when looking at babies, newborns are drawn to faces. This attraction does not occur because newborns recognize the social significance of faces, but simply because their visual systems are especially sensitive to the kind of stimulation faces provide. Newborns' inspection of faces is further encouraged by the fact that the baby's face is usually about eight inches away from the caregiver's during early feeding, an ideal distance for newborns' limited visual acuity. Newborns are also predisposed to respond to human speech. Babies discriminate among speech sounds at a very early age, and they can hear quite well in the pitch range of human voices, including the squeaky baby-talk voice many parents use (Fogel, 1993). In addition, newborns have built-in coordination between hearing and head movements, allowing them to turn automatically in the direction of a voice and look at the speaker's face.

A final predisposition that helps the newborn become part of a social system is the baby's inclination to fall in step with the caregiver's behavior (Fogel, 1993). In one study, babies being given up for adoption were cared for twenty-four hours a day by one of two nurses, Nurse A or Nurse B (Sander, 1975). Nurse A did not respond as quickly as Nurse B to her babies' cries of distress, but when she did respond her caretaking was less hurried and less perfunctory. Nurse B's behavior was somewhat abrupt and fragmented. Within ten days, the infants in Nurse A's charge had more regular sleeping and eating patterns than those cared for by Nurse B. The behavior of Nurse A's babies seemed to mirror her own...
easygoing style. Even more striking, when infants were suddenly switched from one nurse to the other, they showed marked disruptions in sleeping and eating.

Newborns show a range of tendencies and abilities that prepare them to enter the social world very rapidly. Yet it is not accurate to refer to newborns as innate social beings, in the sense of being able to have organized, intentional interaction with other people. However, newborns are exquisitely attuned to becoming social, provided that responsive social partners are available. The development of this true social give-and-take is the subject we turn to next.

The Origins of Reciprocity

Over the first months of life, developmental changes take place that set the stage for the emergence of true social interactions involving mutual exchanges, or reciprocity, between partners. Babies stay alert for increasingly long periods, during which they actively engage the environment. At the same time, they become able to control attention, coordinate looking and reaching, and turn toward or away from stimulation voluntarily. Coupled with this is their ability to punctuate attentive looking with smiles, coos, and actions. Parents take advantage of these newfound capacities to build longer and more complex chains of interaction with their infants. Consider this example of John Williams interacting with 4-month-old Malcolm:

Hi there, big fella. Whatcha lookin' at? Can you look at me? That's right. Hey! Your ol' man's gonna getcha. Yes he is. (Brief pause.) He's gonna getcha and gobble ya right up. What do you think of that? Come on. Come on, you little tiger. Let me see those gums. Hmmm? (Pause.) Yeah, that's right . . . that's right. (Malcolm smiles broadly and bobs his head. His father responds in kind.) Well, now, are ya gonna say somethin'? Are ya? (John nods his head and widens his eyes.) Come on! (He pauses again, and Malcolm starts cycling his arms and kicking his feet.) Come oooon! (Longer pause. Then Malcolm gurgles happily.) Yeah, that's right! (John's smile broadens and he laughs.)

Social learning theorists would emphasize the mutual reinforcement at the end of this sequence; both father and son derive pleasure from it, making it likely to be repeated. But the broader learning context is also important. Notice how John frames the interaction (Fogel, 1993; Stern, 1985). He waits until Malcolm seems receptive, then begins with gentle vocal and visual stimulation. He builds Malcolm's interest by varying the stimulation and gradually increasing its intensity. He takes cues from Malcolm in timing his words and actions. Equally important, he pauses and waits for Malcolm to take turns in the dialogue, and he reinforces Malcolm's vocal behavior. Detailed observational studies show that exchanges between caregivers and infants become more varied and complex through such interactions over time (Papoušek et al., 1986).

T. Berry Brazelton, who has studied parent-infant dialogues extensively, sees the caregiver as providing a holding framework for the baby. The caregiver holds the infant with hands, eyes, voice, smile, and changes from one form of stimulation to another. "All these holding experiences are opportunities for the

Reciprocity:

True social interactions involving mutual exchanges between partners.

Parents provide the framework for increasingly complex interactions with infants.
infant to learn how to contain himself; how to control motor responses, and how to attend for longer and longer periods. They amount to a kind of learning about organization of behavior in order to attend” (Brazelton, Koslowski, and Main, 1974, p. 70).

Infants can play their part and share in the joyful outcome only if caregivers appropriately guide the interaction (Fogel, 1993; Thompson, 1998). The parent must draw forth and enhance the infant’s attention and involvement, pacing and modifying the stimulation in coordination with signs from the baby, a process known as attunement (Stern, 1985). Attunement is part of a more general style of behavior known as sensitive care, which involves being aware of a baby’s feelings and needs and responding to them promptly and effectively (Ainsworth, Blehar, and Wall, 1978). Sensitive caregivers do not overstimulate an infant by continuing stimulation when the baby is not ready for it, nor are they chronically unresponsive. In our example, John must allow the level of tension to rise and fall in its natural course. He cannot force interactions when Malcolm is unreceptive. If Malcolm temporarily looks away to slow the pace of the stimulation, John must wait for Malcolm to indicate his readiness to continue. If John pursues him, Malcolm is likely to cry.

Caregivers vary considerably in the sensitivity of their interactions with their babies; recall Karen’s unsuccessful attempts to engage Meryl with the Oscar the Grouch toy in our earlier story. (Figure 6.1 portrays the timing of caregiver and infant behaviors in sensitive and insensitive interactions.) However, sensitive care can be learned in the natural course of tending to a baby; through hours of interaction most parents become able to read the moods and signals of their infant and modify their own behavior accordingly.

**Figure 6.1**
SENSITIVE AND INSENSITIVE INTERACTIONS
These graphs show the reactions of two different mothers to their babies’ efforts to pace the interaction by turning away. The dashed line shows the baby’s looking behavior. When the dashed line is below the horizontal center line, the baby is looking away from the mother. The solid line shows the mother’s behaviors (talking, touching, making faces, etc.). The mother in part (A) shows a pattern of sensitive care, reducing her stimulation when the baby looks away; he soon looks back to her and she stimulates again. The mother in part (B) keeps stimulating her baby, which seems to keep him away for a long time. (Source: Adapted from Brazelton, Koslowski, and Main, 1974.)
The beginnings of this coordinated interaction can be seen in the feeding of a newborn (Fogel, 1993). As mentioned in Chapter 4, newborns suck in a burst-pause pattern, a succession of rapid sucks followed by a period with little or no sucking. Lower brain regions control this pattern; the baby does not intentionally produce it. Yet caregivers often interpret the pause as a cue to respond by stroking, cuddling, or talking to the infant (Kayee and Wells, 1980). In this way, a kind of turn-taking emerges. The baby sucks, then pauses; the caregiver talks and moves; the baby starts sucking again. The caregiver behaves as if the baby’s pauses were intended to elicit a response, but in fact this is only a pseudodiaglogue (Hayes, 1984). The caregiver single-handedly orchestrates the pattern by coordinating his or her behavior with the baby’s sucking. Through such coordination, the infant is initiated into the turn-taking of human communication.

Soon the baby’s involvement in social encounters becomes more complex (Papoušek et al., 1986; Stern, 1985). By 3 or 4 months, infants acquire a range of facial expressions and sounds that can be used in interactions. Babies this age also have good control of their head and eye movements, allowing them to determine what stimulation they will pay attention to. When social overtures are dull and repetitive and the baby’s arousal level falls too low, he or she will search for something more interesting to look at. Conversely, when social overtures become too arousing, a baby will turn away as if to reduce the stimulation temporarily, or perhaps to process it.

Reciprocity is learned gradually, with each advancement setting the stage for the next. The process is analogous to teaching Ping-Pong to an older child (Sroufe, 1995). First you hit the ball right to the child’s paddle so it can bounce back without much active involvement from the child. The child’s shots may go anywhere, and it is up to you to keep the ball moving and to maintain the appearance of a game. Next, you encourage the child to swing the paddle and to gradually learn how to aim the ball. In time, the youngster becomes a full participant in the give-and-take. So it goes with the development of reciprocity. Newborns’ behavior prompts adults to provide stimulation that leads them toward more focused and organized interaction. Gradually, caregivers provide richer stimulation and encourage more participation from babies. Ultimately, genuine social partnerships develop as the baby becomes a purposeful, social being.

**Becoming an Active Participant: The Example of Social Smiling**

An excellent example of this developmental process can be seen in the emergence of social smiling. Imagine Christine in the hospital soon after Mikey is born. She has just finished nursing him, and as he drifts off to sleep the corners of his mouth twist up in a tiny smile. Christine is elated. She is sure that Mikey is telling her that he is warm, full, and content. Like Christine, many parents attribute to very young infants emotions such as joy, anger, fear, and surprise (Emde, 1985). Such attributions play an important role in the developing relationship with the infant.

Technically, Christine’s interpretation is not correct. Newborns’ smiles do not really indicate pleasure in the sense that older infants’ smiles do; they are caused by spontaneous discharges in lower brain regions. One indication of this is that newborns smile almost solely during sleep (Sroufe, 1995). If their smiles were a sign of pleasure, they would occur when wide awake as well. Other evidence comes from the study of premature infants and those born without a cerebral cortex. Newborn smiles are more common in these babies than in normal children, suggesting the involvement of lower brain regions. In addition, the newborn sleep smile disappears in normal babies as the cortex matures.

You may wonder what happens during sleep to make newborns smile. The answer seems to be gentle fluctuations in arousal around a critical threshold, causing the facial muscles to relax into a little smile (Sroufe, 1995). As shown in Figure 6.2, a newborn who is sleeping lightly will smile five to eight seconds after a rattle is gently shaken. It takes time for the baby’s arousal level to rise slightly and then fall, bringing on the smile. If a sleeping baby is gently shaken toward wakefulness, a series of little smiles occurs. But if a sleeping newborn is startled, causing the arousal level to shoot up, no sleep smiles occur for quite some time.
Figure 6.2
AROUSAL THRESHOLD AND NEWBORN SLEEP SMILES
The newborn’s smiles during sleep are due to fluctuations in central nervous system arousal or excitation. These may occur spontaneously, as is shown in part (A), when the infant’s depth of sleep changes. Notice that following a startle reaction, it is some time before the excitation falls below the arousal threshold (the blue line) and the smile recurs. Sleep smiles may also occur following stimulation, as shown in part (B). Here a rattle is shaken, and six seconds later a smile occurs.

Even though Christine is technically wrong in the meaning she gives to Mikey’s first smiles, she is correctly anticipating what is to come. These winsome expressions strike a chord within her, drawing her closer to the baby. Just as infants are preadapted to interact with adults, adults are preadapted to interact with infants. Over the next few weeks Mikey begins to smile when he is awake, as Christine talks to him, nuzzles him, and gently claps his hands together. She spends quite a bit of time engaged with him, partly because his smiling and cooing are rewarding to her (Stern, 1985). Like most parents, she interprets her baby’s behavior as more advanced and intelligent than it really is. At 5 weeks, when Mikey grins and coos as Christine chirps at him, she assumes it is because he has a special liking for her voice. In fact, any gentle stimulation (music boxes, bells tinkling on his crib) can produce the proper degree of excitation to elicit a smile (Sroufe, 1995). Soon, however, Christine’s voice will be special to Mikey.

At 8 to 10 weeks, Mikey begins to smile when Christine’s face appears above his crib. He is not smiling because he knows her, as Christine might think. At this age Mikey’s smiles are not reserved for his mother. He smiles when the kicking of his feet makes his mobile turn, when Maggie repeatedly presents him with the same stuffed bear, and when any face appears before him (Shultz and Zigler, 1970; Sroufe, 1995). These smiles are due to a form of visual mastery called **recognition assimilation** (Piaget, 1952; Zelazo, 1972). With effort, Mikey is making sense of some familiar object, recognizing it as something he has seen before. In Piaget’s terms, he is assimilating an event to an established scheme. The effort causes tension, which is broken by recognition, and the smile follows. Once again, fluctuations in arousal lead to a smile, but here the fluctuations are due to cognitive effort and assimilation. Turning mobiles, dangling teddy bears, and human faces can all be assimilated with effort at 10 weeks, and all produce smiles. Since these smiles are related to the meaning of the events for Mikey, it is appropriate to say that he is now smiling in pleasure. The mastery of recognition, in other words, is enjoyable to him.

Christine’s natural feeling of being special to Mikey serves to encourage further interaction. By 3 months Mikey can discriminate familiar from unfamiliar faces and prefers to look at familiar ones. By 4 or 5 months, he not only can discriminate Christine’s face from other people’s but also reacts specifically to her face. At this point he stops smiling at strangers, and his smiles are reserved for people he knows (Sroufe, 1995). Now his mother’s and father’s faces really are special to him, and his smiles are truly social.

In summary, social development during the first six months is a product of the interplay between infants and caregivers. Parents attribute meaning to interactions with their newborns, partly on the basis of the babies’ responses when they talk and play with them.
That meaning prompts them to continue their attentions toward their babies and to elaborate the stimulation they provide. In time, with cognitive maturation, the babies come to share in the meaning of social exchanges. By 10 weeks they feel pleasure in interacting with their caregivers; by 4 or 5 months they visually recognize their caregivers as distinct from other people. Gradually babies come to participate reciprocally in games, even initiating them. Thus, newborns' built-in reactions to stimulation from caregivers lead to remarkable social behavior by the end of the first six months.

Emotional Development

Emotional development includes the emergence of the various emotions and the development of emotional regulation, the capacity to control and modulate emotion. We will examine both of these aspects of emotional development in infancy.

Forerunners of Basic Emotions

An emotion can be defined as a state of feeling that arises when a person evaluates an event in a particular way. It usually has characteristic physiological and behavioral changes associated with it. For example, 8-month-olds placed on the "deep" side of the visual cliff, as described in Chapter 4, seem to evaluate the apparent drop-off as a dangerous situation. They show physiological and behavioral responses indicating fear—an elevated heart rate, a fearful facial expression, and frantic attempts to move to the "shallow" side. Infants who have not yet started to crawl do not appear to evaluate the situation in the same way and do not show any of the physiological or behavioral signs of fear.

Basic emotions emerge gradually over the first year of life as infants' emotional responses become increasingly differentiated and increasingly tied to the meaning of specific events. During the first six months, the newborn's initial reflexive, physiological responses to stimulation develop into forerunners of specific basic emotions.

From the very beginning, infants show reactions that seem emotional, starting with the loud, indignant cries and sleep smiles of the newborn. However, these earliest reactions are reflexive responses to the environment that reflect varying levels of arousal, rather than specific emotions (Saarni et al., 1998; Sroufe, 1995). During the first weeks of life, infants sometimes show culturally universal facial expressions associated with basic emotions such as joy, anger, and fear (Izard and Malatesta, 1987). But these early expressions are fleeting and irregular, they are not always easy to distinguish from each other, and they are
not clearly related to specific events (Oster, Hegley, and Nagel, 1992). For these reasons, they probably do not mean the same thing in early infancy that they will mean later on.

By 3 months infants begin to show more specific emotional responses to events. We saw emotion when 10-week-old Mikey smiled after effortful recognition of a human face. No longer did Mikey smile merely because of physical stimulation, such as being jostled. Instead he smiled in response to the meaning of an event—the appearance of a familiar face. The accompanying state of feeling is a genuine emotion of pleasure. Between 3 and 6 months, infants also begin to show wariness after prolonged inspection of an unfamiliar face and frustration when prevented from carrying out an established motor routine, such as reaching for, grasping, and mouthing a toy.

However, these responses still differ from the full-blown emotions of joy, fear, and anger in several ways (Sroufe, 1995):

- The emotional reactions of 3- to 6-month-olds often require time to build up.
- The meanings attached to the events involved are very general.
- Emotional responses are still somewhat global and not well differentiated.

For example, 5-month-old Malcolm may become intensely distressed when he cannot reach a toy from his infant seat, but only after looking at it and straining to reach it for some time. His distress would not be due to desire for that particular toy; he might become frustrated if any motor routine were interrupted. And his reaction to not being able to reach the toy would be very similar to how he might react to a stranger’s stare—crying, thrashing, and flailing his arms and legs. There are not yet clearly distinguishable responses that specifically indicate fear or anger.

The Beginnings of Emotional Regulation and Coping

Babies gradually acquire the capacity to cope with or manage emotionally arousing situations. Newborns have built-in coping mechanisms, such as sleeping deeply following surgery or falling asleep in the face of repeated unpleasant stimuli (Sroufe, 1995). But such reactions are global and involuntary, and they remove the infant from interaction with the environment. By 4 or 5 months, infants can turn away from a source of stimulation, but this response is still fairly global and not well controlled by the baby. For instance, a 5-month-old will typically have difficulty turning away from a staring stranger; instead, the baby will be drawn back to the stranger’s face and end up crying. Crying is a coping technique because it may bring help, but it still interrupts contact with the environment. Considerable further advances in coping skills, as well as in the emergence of basic emotions, will occur during the second six months of life.

DEVELOPMENT IN THE SECOND SIX MONTHS

As extraordinary as development is in the first six months, it is equally rapid and far-reaching in the second six. Cognitive development during this period makes babies increasingly able to recognize specific people as separate, independent entities who act and can be acted upon. It also enables a capacity for intentional behavior and a rudimentary sense of self (Saarni et al., 1998; Sroufe, 1990; Stern, 1985). These advances have important implications for the emergence of specific emotions, as well as for the capacity to regulate and control emotions.

Between 6 and 12 months, babies’ social behavior becomes increasingly organized around their principal caregivers, with a purposefulness not seen in earlier months. Ten-month-old Malcolm greets his mother joyfully and seeks her out when he is distressed. These behaviors indicate he has formed a specific attachment to her, a special closeness and sense of security in her presence. This specific attachment, which also occurs with fathers and other regular caregivers (such as Malcolm’s grandmother), is one of the major developmental landmarks of infancy.

Developments in the second six months are so dramatic that they can be considered qualitative advances. Remember from Chapter 1 the enormous difference between a 6-month-old and a 10-month-old confronted with the sight of mother with a cloth dangling
from her mouth. The older baby is a fundamentally different child from the younger one. This difference was demonstrated in a classic study on the effects of hospitalization during infancy (Schaffer and Callender, 1959). Babies older than 7 months protested being hospitalized, were negative toward the hospital staff, and needed a period of readjustment after returning home, during which they showed much insecurity centered on their mothers. Apparently, disruption in the relationship with the mother was the core of the problem. Babies under 7 months old showed none of these adverse reactions. They had not yet experienced the critical emotional changes that occur during the second half-year. In the section that follows we'll take a look at some of these changes.

**Emotional Development**

Emotional reactions become more frequent in the second six months of life, and they change in several fundamental ways (Lewis and Michalson, 1983; Papoušek et al., 1986; Sroufe, 1995):

- Clearly differentiated specific emotions emerge (Sroufe, 1995).
- Emotional responses become increasingly immediate, rather than requiring time to build up (Camras et al., 1992).
- All the classic facial expressions of emotion begin to appear regularly (Izard and Malatesta, 1987; Oster et al., 1992).

By the end of the first year of life, infants can recall past experiences, anticipate outcomes, and behave intentionally. As a result, their emotional reactions occur in response to events with particular meanings. Laughing while pulling a cloth from the caregiver’s mouth and stuffing it back in is not based simply on recognition of the caregiver and the cloth, but on the anticipated consequences of an action. Such an immediate positive emotional reaction may be called joy. Likewise, an 8- to 10-month-old may immediately become upset when pursuing a ball that rolls under a couch or may react negatively to an adult in a white lab coat following a trip to the doctor for shots. Such reactions are examples of genuine anger and fear, in contrast to the more primitive emotional responses of the first six months. In the second six months, babies also show genuine surprise when something unexpected happens, such as a toy suddenly disappearing through a trapdoor in a high chair tray (Hiatt, Campos, and Emde, 1979).

**Emotional Reactions to the Unfamiliar**

If a stranger locks a 5-month-old in a fixed stare, the baby often purses the stranger soberly and then starts crying after thirty seconds or so (Bronson and Pankey, 1977). A few months later (usually between 7 and 10 months), babies begin to react negatively to strangers even without prolonged inspection of them (see Figure 6.3). This stranger distress usually continues for two or three months, sometimes extending into the second year (Emde, Gaensbauer, and Harmon, 1976; Sroufe, 1995). The degree of stranger distress varies greatly from baby to baby. At its most intense, it has all the earmarks of real fear, with wary looks followed by turning away, pulling away, and occasional whimpering and crying. Significantly, at the same age infants first show fear in other situations, such as high places or impending collisions (Sroufe, 1995).

Research shows that distress toward strangers is not just wariness toward unfamiliar things in general. If a 10-month-old’s mother does something highly novel, such as
covering her face with a mask, the baby will usually squeal with delight. However, if a stranger puts on a mask and approaches, the baby will typically get upset; if the baby’s mother then puts on the same mask, the baby will also become distressed (Sroufe, Waters, and Matas, 1974). All these events are novel, so it is not novelty alone that elicits a negative reaction. In fact, mother putting on a mask after a stranger does should be less novel than when mother puts on the mask first. Clearly, novel events can be either frightening or delightful, depending on how secure the baby feels in the particular context.

The context also influences reactions to strangers in general. In a standard stranger-response study, a stranger greets an infant from the doorway of a room, then gradually approaches and picks the baby up. Although babies may smile at the stranger from a distance, they often become alarmed when the stranger walks over and tries to lift them (Waters, Matas, and Sroufe, 1975). The more rapidly the stranger approaches and the more intrusively he or she behaves, the more likely the baby is to become distressed. Familiar surroundings can greatly reduce stranger distress; babies show less fear of strangers at home than in a laboratory. Stranger distress is even reduced when the newcomer uses familiar formats to interact with the infant, such as playing with a favorite toy in the same way the caregiver does (Saarni et al., 1998; Sroufe, 1995), or when the infant is allowed to have control over the stranger’s approach (Parritz, Mangelsdorf, and Gunnar, 1992). The caregiver’s presence and reaction to the situation can also affect the infant’s reaction. Infants usually show less fear of strangers when the caregiver is close by, but if the caregiver shows a worried expression, infants cry more and smile less at strangers.

In short, by about 10 months infants can make rudimentary evaluations of the threat posed by strangers and other novel events (Kagan, Kearsley, and Zelazo, 1978). These evaluations depend heavily on the context in which the events occur, particularly the child’s sense
of security and opportunities for control (Saarni et al., 1998; Sroufe, 1995). On the basis of such factors and previous experience, infants categorize an event as liked or disliked.

**Emotional Regulation and Coping**

Infants’ skills for emotional regulation expand dramatically in the second six months, and their coping techniques become increasingly subtle, flexible, and serviceable (Bridges and Grohlick, 1995; Gunnar et al., 1989a). A remarkable example can be seen in the stranger-approach procedure (Waters et al., 1975). As a stranger approaches, many 10-month-olds show a pattern of brief glances down and away, followed by looking again. As shown in Figure 6.4, these gaze aversions are coordinated with heart rate acceleration, an indication of emotional arousal. As the infant watches the approaching stranger, the heart rate speeds up. Then the infant glances away, and the heart rate slows again. The infant is then relaxed enough to look at the stranger once more. Infants who show this pattern typically do not cry and are more accepting of the stranger on a second approach. Infants who cry or turn completely away typically are more upset on a second approach.

Another important coping technique that appears during the second half-year is purposeful signaling to the caregiver (calling, gesturing, emitting distress signals) or moving to the caregiver when threatened, as when Mikey signaled his mother to pick him up when he was frightened by Uncle Dan’s toy. Unlike crying, these techniques help the infant maintain organized behavior and stay in contact with the environment. Regulation of emotion in infancy is often dyadic regulation—that is, accomplished by caregiver and infant together (Bridges and Grohlick, 1995). This use of the caregiver as a way of coping with novelty or threat is a hallmark of attachment, our next topic.

In summary, by late in the first year infant emotional reactions are based on the specific meaning of events, not their mere occurrence. At the same time, infants have developed increasingly sophisticated skills for coping with emotional arousal. Such complex behavior is congruent with evidence that by this time pathways have been established between the cerebral cortex and the limbic system, an area of the brain involved in emotion (Schore, 1994).

**The Formation of Attachments**

Attachment is an enduring emotional tie between an infant and a caregiver (Bowlby, 1969/1982). The attachment relationship has special emotional qualities, which are evident not only in the baby’s distress on being separated from the caregiver and joyous greeting
on being reunited, but also in the security the child seems to derive just from being in the caregiver's presence. By age 12 months, babies want to be picked up specifically by the caregiver, they seek the caregiver out when they are upset, and they are happier exploring new surroundings if the caregiver is nearby (Ainsworth et al., 1978; Thompson, 1998).

**Hallmarks of Attachment**

The development of attachment follows a regular course across diverse cultures. One sign that attachment is emerging is **separation distress**. At about the same time infants show negative reactions to strangers, they also cry when their caregivers temporarily leave them. These reactions occur somewhat earlier in cultures in which mothers remain in constant contact with their infants, such as the Ganda culture of East Africa (Ainsworth, 1967). However, they are seen by the end of the first year in all cultures that have been studied (e.g., Kagan et al., 1978).

At about the same time, **greeting reactions** emerge (Vaughn, 1978). As soon as Christine appears in the doorway, Mikey smiles, squeals, bounces up and down, and stretches out his arms. He does not look, ponder his mother, and wait for some social signal. The joyous response is immediate. Apparently, Christine has become linked in Mikey's mind with special, very positive feelings. People in his world are acquiring emotional significance, just as they do for adults.

A final hallmark of attachment is **secure-base behavior**. One-year-olds show a pattern of exploration centered on the caregiver. They explore more confidently when the caregiver is present, and they monitor the caregiver's accessibility, checking back from a distance. They retreat to their secure base—the caregiver—when threatened, then venture forth again when reassured (Bowlby, 1969/1982, 1988; Sroufe, 1995).

**The Bases of Attachment**

The attachment relationship develops over the first year and continues to evolve during toddlerhood and beyond. Like other relationships, it is the product of countless hours of interaction during which caregiver and infant learn to coordinate their behavior. Attachment is distinct from **bonding**, the parent's tie to the newborn, which some argue can occur only in the first hours after birth (Klaus and Kennell, 1976). Attachment is a two-way relationship between parent and infant that develops over a long period of time. As we will see, there is ample evidence that attachment has long-term impacts on infants' development. In contrast, numerous studies have failed to demonstrate a critical need for immediate contact between parents and newborns. Even premature infants initially separated from their biological mothers usually develop normal attachment later in infancy (Easterbrooks, 1989;
Rode et al., 1981). Early contact between parents and infants can be beneficial because it starts a relationship, but it is not absolutely critical.

Since attachment is the product of repeated interaction with a caregiver, it does not have to be the biological parent to whom a baby becomes attached. When infants are adopted early in the first year, they are just as likely as other infants to develop healthy attachment relationships (Nordhaus and Solnit, 1990; Singer et al., 1985). Moreover, infants often become attached to more than one person. Infants in Israeli kibbutzim (communal farms), who are largely tended by communal nurses but spend time each evening with their parents, become attached both to their parents and to the substitute caregivers (Sagi et al., 1994). In many cultures, babies typically become attached to both fathers and mothers (Lamb et al., 1982; van Ijzendoorn and de Wolff, 1997), though frequently they show a preference for the mother during times of threat (Cox et al., 1992). This preference probably results from the greater involvement that mothers usually have with infants. If someone other than the mother is the principal caregiver, in terms of both time and emotional commitment, that person is likely to become the child’s main attachment figure.

For an infant to have several attachment figures ordered into a hierarchy on the basis of each relationship’s strength makes a great deal of sense. From a learning perspective, it is reasonable that an infant who interacts regularly with more than one person will become attached to each of them, with the strongest attachment to the person who is the most involved with the child. From an evolutionary perspective, a hierarchy of attachment figures seems essential. When threatened by a predator, human infants of the distant past could not debate where to flee. They had to seek protection immediately, and having a primary attachment figure to go to helped ensure that protection would be found. Yet should this primary attachment figure die or be otherwise unavailable, infants must have the capacity for other attachments.

Many theories have been proposed to explain the processes underlying attachment formation. Early psychoanalytic theory and traditional learning theory suggested that infants became attached to the mother because she was associated with feeding. Theorists such as Erikson and Bowlby placed more emphasis on the interaction between caregiver and child. Bowlby (1969/1982) argued that the tendency to become attached has been built into humans and other primates through natural selection. According to Bowlby, all that is required for an attachment to form is that an adult be present to engage the infant; food need not be involved.

A classic set of studies by Harry Harlow and his colleagues at the University of Wisconsin supports the view that association with feeding is not the basis of attachment (e.g., Harlow and Harlow, 1966). Harlow separated baby rhesus monkeys from their mothers and raised them with various kinds of substitute mothers. In one study, each baby was raised with two substitutes, one made of stiff, bare wire, the other covered with soft terry cloth. The wire mother was equipped with a bottle for feeding. From the perspective of associative learning, the infant monkeys would be expected to become attached to the wire mother because it was associated with food. But the babies clearly preferred the terry cloth mother. They spent more time with the terry cloth mother and quickly ran to it when distressed. Apparently, for the development of an attachment, the ability to cling to the terry cloth mother and derive security from it was more important than feeding. Similarly, human infants do not become attached to their parents simply because the parents feed them. Rather, they become attached because the parents engage them in interaction.

Although all human infants become attached, not all attachments are the same. In the next section we consider differences in the security of infants’ attachments, as well as other individual differences during infancy.

**EXPLAINING INDIVIDUAL DIFFERENCES IN EARLY SOCIAL AND EMOTIONAL DEVELOPMENT**

Observers are often impressed with the dramatic differences among babies. Some are easily aroused, cry often, and are difficult to settle. Others are placid and rarely become upset. Some are confident when facing new experiences, especially with attachment figures present.
Others are timid and hesitant about anything novel. Even newborns differ in how much they sleep and cry and in how quickly they soothe themselves or can be soothed by others.

Researchers ask a number of questions about such individual differences during infancy: How consistent are the differences? Do differences at birth predict differences at 12 months? What are the implications of individual differences in infancy for later development? Do they continue to be part of the child's personality? Finally, how are such differences to be explained?

There are two major approaches to explaining individual differences in infant behavior. One, based in Erikson's psychosocial theory and Bowlby's attachment theory, emphasizes the quality of care the infant receives and the resulting variability in the security of infant-caregiver attachment. The other emphasizes the baby's inborn temperament, based on genetic makeup and other biological influences, especially those surrounding pregnancy and birth. Although these approaches have led to two distinct lines of research, they are not necessarily in conflict with each other. Rather, they are two different perspectives on the same set of phenomena. In fact, a great deal of recent effort has been aimed at harmonizing or integrating the two views.

The Attachment Framework

In all but the most extreme cases, infants become attached to a caregiver. Mentally retarded infants become attached, though at a later age than other infants (Cicchetti and Beeghly, 1990). Blind infants and physically disabled infants become attached, with some differences in the behaviors they use to express attachment (Marvin and Planta, 1992; Stroufe, 1995). Even abused infants become attached (Cicchetti, Toth, and Lynch, 1995). Only if there is no opportunity for ongoing interaction with a specific caregiver will there be a failure to attach, as in the case of some institutionalized infants (Dubrovina and Ruzska, 1990; Johnson, in press).

Noting the universality of attachment, John Bowlby sought to identify individual differences in attachment quality. Such differences could be seen in Harlow's studies of monkeys raised with substitute mothers. When some of these monkeys later had babies, they seemed to be rejecting and punitive parents. Their infants were nevertheless clearly attached to them, but the attachments had an anxious quality, with the infants constantly trying to cling to their mothers.

Bowlby hypothesized that the quality of a baby's attachment is based on the quality of care the baby receives. When infants experience sensitive care, they become confident the
caregiver will be responsive. Being able to count on the caregiver’s presence and comfort gives the infant a base for exploring the environment and a ready resource in case of threat or distress. After repeated experiences in which the caregiver responds to signals, is available for communication, and alleviates stress, the baby comes to expect that such care will regularly be available. This confidence in the caregiver’s availability is what Erikson means by trust and what Bowlby refers to as secure attachment. Secure attachment relationships cannot develop if care is unavailable or hit-or-miss, or if the adult actively rejects the infant’s bids for attention and care. In such cases the infant will probably develop an insecure or anxious attachment.

Patterns of Attachment
To test Bowlby’s hypothesis, researchers needed to measure both security of attachment and sensitivity of care, so they could examine links between the two. Mary Ainsworth, a psychologist at the University of Virginia, pioneered the study of qualitative differences in attachment (Ainsworth et al., 1978). On the basis of observations in the home and the laboratory, she identified a pattern of attachment she called secure and several patterns she called anxious (see Table 6.1). To identify patterns of attachment, Ainsworth devised a laboratory procedure known as the Strange Situation. In this procedure, the baby and the caregiver (always the mother in Ainsworth’s experiments) enter a playroom, which the baby is free to explore. In a series of episodes, the baby is then exposed to a strange adult with and without the mother present, is left alone briefly, and is reunited with the mother. The baby’s behavior in the Strange Situation is thought to reveal the sort of attachment he or she has to the caregiver.

Most infants (around 60 to 70%) form a secure attachment. These babies show a good balance between play and exploration on the one hand and a desire for proximity to the caregiver on the other. In Ainsworth’s Strange Situation, they separate readily from their mothers to explore. Their responses to their mothers are emotionally positive; in play, they smile at their mothers and share discoveries with them. When the stranger enters, these babies are usually not unduly wary. They vary in how upset they are by the separation from their mothers. Regardless of their reaction to the separation, they respond positively to their mothers’ return and differentiate clearly between mother and the stranger. If not unduly distressed, they show pleasure, greeting their mothers happily. If they are more upset, they quickly and effectively seek their mothers out and remain with them until reassured. Usually this comforting is smooth and rapid; before long the securely attached infants are crawling or toddling off contentedly to explore the world again.

In contrast, infants with an anxious attachment are unable to use the caregiver as a secure base for exploration. Such a lack of security takes several forms. One pattern is anxious-resistant attachment. In this pattern, infants seek a great deal of contact with their caregivers. During the Strange Situation, they are reluctant to separate from their mothers despite an array of attractive toys. When they do venture forth, even a minor stress often sends them scurrying back to their mothers. They are usually rather wary of the stranger. Typically, they are quite upset when their mothers leave, yet they cannot be readily comforted by them at reunion. Many continue to cry and fuss despite their mothers’ efforts to reduce their distress. Most important, they tend to mix bids for physical closeness with resistance to such contact. One moment they may raise their arms to be picked up, the next moment they may squirm, push away, or kick out in anger. Their ambivalent approach to their mothers greatly interferes with their ability to get settled and begin exploring again. They behave as if they cannot get what they need from their mothers.

Anxious-avoidant attachment is quite a different pattern but equally distinct from secure attachment. Infants who exhibit this pattern in the Strange Situation readily separate from their mothers to examine the toys. Typically they are not wary of the stranger, and they do not usually cry when their mothers leave the room. What is striking about these babies is their response when their mothers return. They actively avoid their mothers, turning away, moving away, or studiously ignoring them; they do not behave this way toward the stranger. Infants normally display this pattern following a separation of several weeks from the caregiver (Heinicke and Westheimer, 1966), but not one of just three minutes.

Secure attachment:
A pattern of attachment in which the infant is confident of the caregiver’s availability and responsiveness and can use the caregiver as a secure base for exploration.

Anxious attachment:
Patterns of attachment in which the infant is not confident of the caregiver’s availability and responsiveness and cannot use the caregiver as a secure base for exploration.

Anxious-resistant attachment:
A type of anxious attachment in which the infant separates from the caregiver reluctantly but shows ambivalence toward the caregiver after a separation.

Anxious-avoidant attachment:
A type of anxious attachment in which the infant readily separates from the caregiver but avoids contact after a separation.
<table>
<thead>
<tr>
<th>Table 6.1</th>
<th>PATTERNS OF ATTACHMENT</th>
</tr>
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| **Secure Attachment** | Infant uses caregiver as secure base for exploration.  
| - Readily separates to explore toys  
| - Affective sharing of play  
| - Affiliative to stranger in caregiver’s presence  
| - Readily comforted when distressed (promoting a return to play)  
| Infant actively seeks contact or interaction upon reunion.  
| - If distressed: Immediately seeks and maintains contact; contact ends distress  
| - If not distressed: Active greeting behavior; strong initiation of interaction. |

| **Anxious-Resistant Attachment** | Infant shows poverty of exploration.  
| - Difficulty separating to explore, may need contact even prior to separation  
| - Wary of novel situations and people  
| Infant has difficulty settling upon reunion.  
| - May mix contact-seeking with resistance (hitting, kicking, squirming, rejecting toys)  
| - May simply continue to cry and fuss  
| - May show striking passivity |

| **Anxious-Avoidant Attachment** | Infant shows independent exploration.  
| - Readily separates to explore toys  
| - Little affective sharing  
| - Affiliative to stranger when caregiver absent (little preference)  
| Infant actively avoids caregiver upon reunion.  
| - Turns away, looks away, moves away, ignores  
| - May mix avoidance with proximity  
| - Avoidance more extreme on second reunion  
| - No avoidance of stranger |

| **Disorganized/Disoriented Attachment** | Infant shows inexplicable or conflicted behavior patterns that do not fit other categories.  
| - Sequential contradictory behaviors (e.g., contented play interrupted by extreme anger)  
| - Simultaneous contradictory behaviors (e.g., fearful smile, simultaneous approach and avoidance)  
| Infant appears dazed or disoriented.  
| - May show slow or incomplete movements or stilling (like deer caught in headlights)  
| - May show odd mannerisms (stereotypes) |

Source: Adapted from Ainsworth et al., 1978; Main and Solomon, 1990.

Significantly, avoidance of their mothers is even more pronounced following a second separation, during which many of the babies clearly become upset. Yet when their mothers return, these infants still do not seek them out, nor do they respond to contact with them. The more the stress of the situation increases, the more they avoid interaction with their mothers. Avoidance of the mother, like resistance, greatly interferes with the ability to become settled and return to active exploration.

Mary Main and Erik Hesse (1990) at the University of California have discussed resistance and avoidance as strategies for expressing attachment in different caregiving contexts. They describe the resistant infants as maximizing expression of attachment behavior in the face of inconsistent or chaotic care. Being chronically vigilant and expressing attachment behavior with great intensity may cause the caregiver to respond adequately. The avoidant
infants, in contrast, are minimizing expression of attachment. Since expression of attachment-related needs in the past has led to rebuff, these infants inhibit or cut off such expressions, to keep from further alienating a rejecting caregiver and to maintain some kind of proximity. But what happens when the caregiver is the source of threat, as in the case of abusive parents or parents whose behavior is otherwise frightening or bizarre? Infants in this situation may have an unresolvable conflict, motivated to approach an attachment figure, as other infants are, but also motivated to withdraw from a source of fear. These infants often cannot maintain a coherent strategy for expressing attachment and show what Main calls disorganized-disoriented attachment (Main and Solomon, 1990). In the Strange Situation, infants with this kind of attachment show contradictory features of several patterns or appear dazed and disoriented. They may show obvious signs of fear or confusion. Their behavior may include clear contradictions, such as approaching the caregiver but looking away at the same time. Their movements may be incomplete or very slow, or they may become motionless or show very odd behaviors.

Quality of Care and Security of Attachment
To assess the effects of quality of care on attachment security, researchers have used two approaches. One is to look at parent-infant interaction when the baby is very young and later to assess security of attachment. Numerous studies of this type have found that sensitive care is associated with secure attachment to mothers and to fathers (e.g., Ainsworth et al., 1978; Belsky and Isabella, 1987; de Wolff and van IJzendoorn, 1997; NICHD, 1997; Pederson and Moran, 1996). In these studies, researchers observed parent-child interactions in the home during the baby’s first year of life and rated the parent’s degree of sensitivity as a caregiver. When the infant was 12 to 18 months old, the researchers assessed the quality of parent-infant attachment using the Strange Situation. Across studies, the caregiver’s sensitivity or intrusiveness in the early months of the baby’s life predicts later secure or anxious attachment, but the infant’s early behavior generally does not.

In one representative study (Pederson and Moran, 1996), caregiver sensitivity was assessed at home at 8 months. Infant attachment behavior was assessed at home at 12 months, using an observational measure, and the infants were seen in the Strange Situation at 18 months. The home and laboratory measures of attachment were closely related and both were predicted by earlier maternal sensitivity. Infants with secure attachments at 18 months showed more use of the mother as a base for exploration and more sharing of positive emotion at 12 months than those who had anxious attachments. Infants with both avoidant and resistant attachments fussed more at home, and the avoidant group showed a relative lack of close physical contact when needy. Such studies support the validity of Bowlby’s attachment theory and the Strange Situation procedure.

Particular types of insensitive care appear to be associated with particular types of anxious attachment. Anxious-avoidant attachment tends to be associated with a caregiver who is indifferent and emotionally unavailable or who actively rejects the baby when he or she seeks physical closeness (Isabella, 1993). Anxious-resistant attachment tends to be associated with inconsistent care, including exaggerated behaviors on the part of the mother and ineffective soothing that often becomes overstimulation (Stroufe, 1988). Disorganized attachment is related to frightening or confusing behavior by the caregiver (Main and Hesse, 1990).

The other approach to assessing the effects of quality of care on attachment is to identify parents who clearly neglect or maltreat their infants and compare their babies’ attachments with those of infants whose parents don’t maltreat them. Such studies have routinely found more anxious attachments in the maltreated groups (Carlson, 1998; Egeland and Stroufe, 1981). The specific type of anxious attachment varies and depends somewhat on the type of maltreatment. Several studies have confirmed that maltreated infants show a high incidence of Main’s disorganized-disoriented pattern of anxious attachment (Carlson, 1998; Lyons-Ruth et al., 1990). In addition, extreme poverty and physical neglect are associated with increased anxious-resistant attachment, while anxious-avoidant attachment is more common in cases of physical abuse or emotional unavailability, a pattern in which

Disorganized-disoriented attachment:
A type of anxious attachment in which the infant shows contradictory features of several patterns of anxious attachment or appears dazed and disoriented.

Sensitive care includes responding promptly to infants’ cries.
the caregiver is emotionally unresponsive to the infant. In one study, infants experiencing emotionally unavailable care all had anxious-avoidant attachments by age 18 months (Egeland and Sroufe, 1981).

Since sensitive care involves responding promptly to the baby's cries and other signals, you might wonder whether this attention would reward crying and encourage the baby to cry more. In fact, when caregivers promptly and effectively respond to their infant's cries, the babies actually cry less by the end of the first year and are generally securely attached (Ainsworth and Bell, 1974). These children do not learn to be "crybabies" through reinforcement. Instead, infants with sensitive caregivers apparently learn that their signals will receive quick and appropriate responses and that adults can be counted on to help. By age 12 months they are so confident of prompt responses that they don't need to signal alarm at the slightest stress. They know that if serious distress arises, comfort will be quickly provided.

It should be pointed out that sensitive care does not mean perfect care. Parents need not always attend to the infant immediately or always do the right thing. Care only needs to be "good enough" (Winnicott, 1965). In most cases infant care is adequately sensitive, and the majority of babies develop secure attachments.

The Context of Caregiving
If the development of secure attachment depends on the kind of care the baby receives, then factors that influence the quality of caregiving should be related to attachment. Three such factors have been investigated:

* The amount of stress in the caregiver's life
* The social support available to the caregiver
* The caregiver's own developmental history

Studies of these topics indicate that it is inappropriate to simply blame parents when attachment goes awry. Caregiving must be viewed in its broader social and psychological context, as suggested by Bronfenbrenner's model of developmental contexts, discussed in Chapter 2.

Life Stress and Social Support. It is easier to cope with ongoing problems and everyday hassles when others are available to help and give emotional support. Those who care for infants without help and support from others also tend to experience more financial pressure and stresses of other kinds. Many studies have linked the quality of parent-infant attachment to the amount of stress and social support in caregivers' lives, as measured in interviews (Cox et al., 1989; Crockenberg, 1981; Jacobson and Frye, 1991; Thompson, 1998). If support increases or stress decreases, the quality of the child's relationship with the caregiver can improve, sometimes becoming secure when it had originally been anxious (Thompson, 1998; Vaughn et al., 1979).

Parents' Developmental History. Several studies have now related caregivers' perceptions of their own childhoods to the quality of infant-caregiver attachment (van IJzendoorn, 1995; Ward and Carlson, 1995). Many of these studies have used the Adult Attachment Interview, developed by Mary Main. From the ease with which adults talk about attachment-related feelings, and from inconsistencies among their statements, the degree to which they experienced responsive care and the degree to which they have resolved any feelings of being mistreated are inferred. Such reports may be obtained even before the parents' own child is born. From these reports it is possible to predict the quality of the baby's later attachment (van IJzendoorn, 1995).

Of course, how adults talk about their attachment feelings may be influenced by their current situations. Parents' current difficulties may lead them both to have problems with their infant and to report their own developmental history negatively. Main notes that her Adult Attachment Interview captures adults' current state of mind concerning attachment and does not necessarily reflect their actual early attachment relationships. Some adults whose early lives were quite negative nonetheless achieve a substantial degree of understanding and emotional freedom regarding attachment. When they do, their infants are likely to be securely attached.
Other evidence of a link between parents’ developmental histories and the attachment security of their own infants comes from animal studies. Such studies are only suggestive for humans, but they allow researchers to look at parenting across generations in a short period of time. Lynn Fairbanks (1989) studied mothering among vervet monkeys and found that the amount of physical contact a female monkey received from her mother when she was an infant predicted the amount of contact she later gave her own baby. Moreover, this similarity in behavior was not due to genetic similarity between mother and daughter, or to observational learning by the daughter. The amount of contact the daughter received predicted the amount of contact she later gave better than the average amount of contact the mother gave to all her offspring (a measure of her genetic inclination to give physical contact) or the amount of contact she was currently giving to younger siblings of the daughter (which could serve as a model for the daughter to imitate).

**Infant Attachment and Later Development**

Individual differences in security of attachment are thought to be important because of their implications for later development. The crux of Bowlby’s theory is that different patterns of attachment reflect differences in infants’ expectations, or *internal working models*, of the social world. Internal working models include expectations about the availability of the caregiver, the infant’s own worthiness and ability to obtain care, and social relationships in general. An infant who experiences reliable, responsive care develops a model of the caregiver as available, of the self as worthy of care and effective in obtaining it, and of social relationships as pleasurable and rewarding. According to Bowlby, these representations are carried forward and influence later behavior and relationships, coloring the child’s interpretations of events and influencing the kinds of experiences the child seeks or avoids.

Research tends to support Bowlby’s theory that the quality of attachment helps to shape a child’s internal working model of the social world. Attachment classifications in infancy have been shown to be related to attachment behavior in the home (Ainsworth et al., 1978; Pederson and Moran, 1996; Vaughn and Waters, 1990), to be stable over time in typical samples (Main and Weston, 1981; Waters, 1978), and to predict how well children will function later. Curiosity, enthusiasm in solving problems, high self-esteem, and positive relations with teachers and peers have all been found to be strongly linked to the quality of early attachments. We will discuss the long-term consequences of attachment security more extensively in later chapters.

In summary, attachment theorists focus on the organization of an infant’s behavior toward the principal caregiver, who becomes an attachment figure. The quality of this attachment relationship results from the history of interaction with the caregiver. That interaction, in turn, is influenced by the overall context of care, which includes the stress and social support the caregiver experiences, as well as characteristics of the particular child. The attachment relationship then provides a framework for later development and is reflected in the child’s degree of self-confidence, sociability, and capacity to cope with challenges.

**The Temperament Framework**

Soon after Christine brought Mikey home from the hospital, she noticed that he seemed different from Maggie at the same age. Maggie had been an easy baby to deal with—Christine’s mother and sisters had been amazed at how quickly she fell into a regular sleeping and eating schedule and how easily she adapted to changes. It seemed she could fall asleep anywhere, and she didn’t seem to mind being passed around from relative to relative at the family’s large, noisy holiday gatherings. Mikey wasn’t really difficult to deal with, but it took a bit more time and patience to get him on a regular schedule. Every new experience, from his first bath to his first taste of strained peas, met with mild but clear protest from Mikey. But Christine soon discovered that if she soothe him, kept trying, and gave him a little time, he eventually adjusted to each new thing.
Temperament:
An individual infant’s general style of behavior across contexts.

Some researchers focus on the idea of inborn temperament to explain individual differences in babies’ behavior of the sort that Christine noticed in Maggie and Mikey. Temperament refers to an individual infant’s general style of behavior across contexts; it includes a variety of behavioral characteristics, such as general activity level, irritability, proneness to distress, reactivity, and inhibition (Rothbart and Bates, 1998). Temperament researchers generally assume that individual differences in such characteristics are biologically rooted, although they acknowledge that they can be influenced by environment as well (Rothbart and Bates, 1998).

Early temperament research tended to focus on very specific features of behavior, such as activity and crying. In one of the first temperament studies, Alexander Thomas and Stella Chess (1977) rated infants on nine specific behavioral characteristics, listed in Table 6.2. Using combinations of these characteristics, they categorized some babies as easy; some as difficult, and some as slow to warm up. Easy babies showed high biological regularity, readily approached new objects and people, and were highly adaptable and mostly positive in mood. Difficult babies were biologically irregular, tended to withdraw from new experiences, were low in adaptability, and had intense, mostly negative moods. Slow-to-warm-up babies were somewhere in the middle in regularity and showed mildly negative reactions to new experiences, but tended to adapt after repeated exposure. More recent efforts have broadened the concept of temperament to include such things as tendency to express certain emotions (e.g., wariness, proneness to distress) and capacity to regulate one’s own behavior (Bridges and Grohnick, 1995; Goldsmith et al., 1987; Rothbart and Bates, 1998).

One of the central issues in temperament research concerns the stability or consistency of behavior over time. If stable characteristics exist in infancy, perhaps these are the roots of later personality. Stability from very early in infancy would be especially important, since it would suggest that such differences are inborn. In addition, stable infant characteristics might be shown to influence the infant-caregiver relationship, with significant implications for development.

Table 6.2 INFANT TEMPERAMENT CHARACTERISTICS MEASURED BY THOMAS AND CHESS (1977)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Description</th>
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<tbody>
<tr>
<td>Activity</td>
<td>General degree of mobility as reflected in frequency and tempo of movement, locomotion, and other activity; from highly active to inactive.</td>
</tr>
<tr>
<td>Rhythmicity</td>
<td>Extent to which sleeping, resting, eating, elimination, and other body functions are regular and predictable; from regular to irregular.</td>
</tr>
<tr>
<td>Approach-withdrawal</td>
<td>Type of first reaction child has when encountering new situation such as an unfamiliar person, place, or toy; from approach to withdrawal.</td>
</tr>
<tr>
<td>Adaptability</td>
<td>Extent to which initial withdrawal response to a new situation becomes modified over time; from adaptable to non-adaptable.</td>
</tr>
<tr>
<td>Intensity</td>
<td>Typical intensity of child’s reaction to internal states or environmental situations; from intense to mild.</td>
</tr>
<tr>
<td>Threshold</td>
<td>Strength of stimulus needed to cause child to respond; from high threshold to low threshold.</td>
</tr>
<tr>
<td>Mood</td>
<td>Typical behavior patterns related to general quality of mood; from pleasant to unpleasant.</td>
</tr>
<tr>
<td>Distractibility</td>
<td>Difficulty or ease with which child’s ongoing activities can be interrupted; from high to low.</td>
</tr>
<tr>
<td>Persistence of attention</td>
<td>Extent to which child remains engaged in an activity or returns to activity after interruption; from high to low.</td>
</tr>
</tbody>
</table>
The Stability of Temperament

Early research relied heavily on parents’ reports to measure a baby’s temperament (Thomas and Chess, 1977). These studies did indeed find various aspects of temperament to be stable over time, but they were criticized for two reasons. First, they did not begin in the newborn period, so it was not clear that truly inborn factors were being measured. Second, parents’ reports may have been biased. Early studies found little agreement between parents’ reports and data obtained by other observers (Vaughn and Bost, in press). In one study, questionnaires were given to expectant parents even before the unborn infant was moving (Rothbart and Bates, 1998). These parents’ prenatal ratings (really expectations about what the baby would be like) correlated with their descriptions of the infant months later. This finding suggests that parents’ expectations play a role in their reports about a baby’s temperament.

More recent research, using other approaches to measure infant temperament, has been much more compelling (Rothbart and Bates, 1998). By devising questionnaires in which parents’ judgments are more objective, and by combining parents’ reports with those of other observers and with laboratory tests, researchers have been able to show that there are clear differences in temperament among infants. The question is whether these differences remain stable over time.

In general, assessments of newborn behavior have not predicted later behavior very reliably, although a few studies have found some consistency between temperament soon after birth and in later infancy (Korner et al., 1991; Worobey and Lewis, 1989). However, by 12 months, measurements of such characteristics as frequency of negative and positive emotions and strength of reactions to sensory stimulation are quite stable and predict well to later ages (Emde et al., 1992; Matheny, 1989; Rothbart and Bates, 1998). Assessments of temperament made by parents and other observers bear out this difference; there is much more agreement about temperament in older babies and toddlers than in babies only a few months old (Rothbart and Bates, 1998; St. James-Roberts and Wolke, 1988). Predictions from temperament in early infancy to the preschool years and beyond have so far not been very powerful.

The Biology of Temperament

Researchers have wondered whether differences in infant temperament reflect biological differences. Much is now known about the neurophysiological and hormonal systems underlying infant behavior (Gunnar, 1994; Rothbart and Bates, 1998). For example, infants who are wary in new situations have higher or more variable heart rates and blood pressure than less wary infants do (Kagan, 1992), and they are more likely to show asymmetrical electrical activity in the two sides of the frontal cerebral cortex (Calkins, Fox, and Marshall, 1996). Associations have also been found between hormone levels and a baby’s emotional responses. For instance, high levels of cortisol (a hormone connected to stress) have been linked to parental reports of low adaptability and high emotional negativity, and to later crying in the Strange Situation (Gunnar et al., 1989b).

Thus, biological factors seem to be related to temperament differences observed in babies. But such correlations do not demonstrate that physiological differences are inborn or that they cause differences in behavior. For example, babies who are often fretful may show strong cortisol reactions or markedly variable heart rates not because these physiological changes produce fretfulness, but rather because the physiological changes are a marker of fretfulness. They may show cortisol or heart rate responses simply because they are so fretful.

The Genetics of Temperament

Demonstrating a genetic component for temperament would lend support to the view that the biological differences related to temperament are at least partly inborn. Many studies show more similarity in temperament between identical twins than between fraternal twins (Emde et al., 1992; Matheny, 1989; Rothbart and Bates, 1998). Since identical twins are more closely related genetically, this research suggests a genetic component for temperament. However, fraternal twins often show very little similarity in temperament, despite
the fact that on average they share half their genes. The similarity in temperament of identical twins may be due in part to similar treatment by parents and others. This possibility is strengthened by the fact that identical twins become increasingly similar in temperament with age, but fraternal twins do not.

One study of twins reared in different homes, the Colorado Adoption Study (Plomin, 1994), found evidence of a genetic component for such personality dimensions as inhibition and negative emotions. In this study, identical twins reared apart showed some similarity in these characteristics. However, the similarity between these twins was much smaller than in studies of identical twins reared together, suggesting that environment also has an influence. Interestingly, similarities between identical twins reared apart still increase with age, suggesting that genetic factors may become more prominent after early infancy (Plomin et al., 1993).

Research with monkeys reveals the complexity of understanding temperament. Some characteristics, such as reactivity to stimulation, seem to have a genetic component, while others, such as the tendency to be nurturant, appear to be based more on experience (Suomi, 1995). Temperament and even brain physiology may be shaped and altered by experience (Schor, 1994); for example, the infant’s capacity to stay physiologically regulated can be influenced by the caregiver’s behavior (Kraemer, 1992).

In summary, by the end of infancy, various dimensions of behavior, often referred to as temperament, become stable, with some children more irritable, sociable, or emotionally reactive than others. By this age, there is also agreement among parents and other observers in their descriptions of particular children. However, there is little evidence for stability of behavior from the newborn period. Physiological factors are related to temperament differences, but it is uncertain exactly what roles genetics and experience play in producing these differences.

Temperament and Attachment

Attachment and temperament researchers are describing two different things. Attachment researchers are studying the quality or effectiveness of the infant-caregiver relationship. In contrast, temperament researchers are studying the frequency or intensity of different infants’ behaviors across contexts. It is important to understand both aspects of development and to consider how they might be related (Stevenson-Hinde, 1990).

For a time during the 1980s, efforts were made to explain attachment differences on the basis of temperament differences (e.g., Kagan, 1984). One argument was that differences seen in the Strange Situation were simply differences in infant temperament and did not reflect relationship differences. Perhaps anxious-resistant infants were just temperamentally irritable, and anxious-avoidant infants were aloof. But it was discovered that infants often behaved differently toward each parent in the Strange Situation (van IJzendoorn and de Wolff, 1997), that how a baby behaved in the task changed with changes in level of parental stress (Vaughn et al., 1979), and that traditional measures of temperament were rarely related to attachment security (Vaughn and Bost, in press). Moreover, measures of heart rate and cortisol reactions show that anxious-avoidant infants are not detached, but physiologically aroused (Spankler and Grossmann, 1993). Thus, differences in Strange Situation behavior cannot
be explained by infant temperament alone (Thompson, 1998; Vaughn and Bost, in press). It seems equally unlikely that differences in care and resulting attachment quality can account for all variation in children's temperament, especially given the findings of twin studies.

To reiterate, quality of attachment refers to organization of behavior with respect to a particular partner, while temperament refers to style of behavior regardless of partner. Securely attached infants can have very different temperaments. Some are cuddly, cry a great deal, and are very active. Others cry little, are placid, and rarely want physical contact. Whatever their temperament, all securely attached infants have in common an effective relationship with a caregiver. Securely attached infants seek the contact they need with the caregiver, however little or much it may be, and that contact is effective in alleviating distress. Anxiously attached infants also can have different temperaments, which may affect how their insecurity toward the caregiver is expressed. Insecurely attached infants' sense of availability about a parent availability is probably due to the quality of care they have received, but their tendency to be outwardly angry or more passively distressed may be due to temperament (Belsky and Rovine, 1987).

Not surprisingly, temperament is related to certain behaviors in the Strange Situation, but not to security of attachment itself. Brian Vaughn and his colleagues found that a temperament questionnaire predicted how much infants would cry during the separation episodes of the Strange Situation (Vaughn et al., 1989). However, the questionnaire did not predict how much infants would cry when reunited with their caregivers (probably a better indicator of the quality of the infant-caregiver relationship), nor did it predict whether the relationship was secure or anxious. Similarly, Megan Gunnar and her colleagues (1989b) found that cortisol reactions at 9 months predicted later crying in the Strange Situation but not anxious-resistant attachment. Thus, the baby's tendency to get upset may have some basis in temperament, but how well an infant copes with that upset in the context of the attachment relationship seems to be based on experience.

This is not to say that the two features of development are completely unrelated (Vaughn and Bost, in press). Temperament may help to determine what constitutes sensitive care and thus fosters secure attachment for a particular infant (Sroufe, 1995). For a temperamentally placid baby, frequent stimulation may represent sensitive care, whereas for an easily overaroused infant, frequent, intense stimulation may be insensitive.

Another way temperament and attachment may be related is that, in some cases, the characteristics of a particular infant may be at odds with those of a particular caregiver. The idea that caregiver and infant characteristics may clash is called the match-mismatch hypothesis. There is some support for this idea. Anxious attachment is not predicted by an infant's proneness to distress or by a caregiver's need for control alone, but it is predicted by the two measures together (Mangelsdorf et al., 1990). For example, a parent with a high need to control situations may find it difficult to be sensitive to the needs of a baby who is easily upset.

A third way temperament and attachment may be related is that early infant characteristics may feed into the quality of care parents provide and thereby affect attachment quality. Two studies have shown that newborn irritability predicts anxious attachment in low-income families, with increased anxious-resistant attachment found in the United States (Susman-Stillman, Kalkoske, and Egeland, 1996) and increased anxious-avoidant attachment found in a Dutch sample (Van den Boom, 1989). The cultural differences make clear that these cannot be direct temperament effects. Instead, the effects must be due to differences in how caregivers respond to babies depending on their irritability; exactly how the caregiving differs depends on cultural factors. For example, low-income American mothers may tend to respond to irritable babies with inconsistent care, whereas low-income Dutch mothers may respond by becoming unavailable or rejecting. In middle-class samples, no overall effect of infant irritability has been found; presumably, social support allows middle-class caregivers to compensate for infants' early difficulties (Crockenberg, 1981).

Finally, temperament can be related to attachment when an infant's characteristics tax caregivers' ability to cope. For example, extremely premature infants with serious health problems have an increased likelihood of anxious-resistant attachment (Plunkett et al.,
1986), and prenatally drug-exposed babies have a heightened risk of anxious-avoidant and disorganized-disoriented attachment (Rødning, Beckwith, and Howard, 1989). These effects may occur because some of these infants cry often and are difficult to soothe, and because such difficulties are extremely stressful for parents.

In conclusion, it is useful to think about attachment developing in an interacting system of infant, caregiver, and the larger environment. Trying to decide whether quality of care or infant temperament affects development more is misguided. Infant irritability predicts caregiver insensitivity, but early caregiver insensitivity predicts later irritability even better (Engfer, 1988). Infant temperament is also predicted by parents’ marital satisfaction and self-confidence (Belsky, Fish, and Isabella, 1991; Teti and Gelfand, 1991), and newborn irritability is predicted by mother’s stress and anxiety during pregnancy (Molitor et al., 1984). Quality of care and infant temperament influence one another in a circular way. As a result, positive temperament and security of attachment, uncorrelated in early infancy, do converge by the preschool years (Vaughn et al., 1992).

The total context of development is more important than either the caregiver’s behavior or the baby’s temperament alone. For example, given Karen’s ambivalence about motherhood and newborn Meryl’s crankiness, interaction between the two will tend to intensify these traits. As long as Karen’s situation does not improve, Meryl is likely to become a truly difficult child, even though in different circumstances her initial irritability might have been only temporary (Egeland and Sroufe, 1981; van den Boom, 1989). In contrast, Mikey might be classified as a slow-to-warm-up baby, but Christine’s patience and confidence in her mothering skills help him to adjust to new experiences; over time, the way Christine responds to Mikey will help him manage his negative reaction to novelty and may actually reduce it. This is the transactional model from Chapter 2 in operation; the various parts of the system all affect one another.

**THE IMPORTANCE OF EARLY CARE**

As mentioned in Chapter 1, one of the most fundamental developmental issues is the significance of early experience. If development simply reflects the tally of all experiences, or if new experiences supplant prior ones, there is no unique role for early care (Lewis, 1997). On the other hand, if basic patterns of social responsiveness and emotional regulation are established in infancy, early care is of unique and fundamental importance (Sroufe, in press).

**The Sensitive Period Hypothesis**

The idea that certain kinds of experience are especially important at particular points in development is known as the sensitive period hypothesis. For example, many developmentalists believe the quality of attachments formed in infancy sets the stage for later relationships. This is not to say attachments can form only in infancy or later relationships are always identical to early ones. Rather, later attachment formation may be more difficult if opportunities were absent during infancy, and the quality of early relationships may be of special importance for later development.

Studies of monkeys provide convincing evidence for the power of early experience. Monkeys who spent their early months with peers but without parents show abnormal behavior, such as marked fearfulness and clinging (Suomi, 1977). Monkeys isolated for six months are social misfits, and those isolated for the first year are completely unable to relate to others (Suomi and Harlow, 1971). Moreover, isolation for the first six months (equivalent to more than a year for humans) has more profound effects than isolation in the second six months. The social handicaps of monkeys isolated their first half-year are very difficult to overcome, even with prolonged special rehabilitation (Suomi, Harlow, and McKinney, 1972). Monkeys isolated as babies who appear to be functioning normally after years in supportive groups revert to their earlier disturbed behavior when placed in cages.
like those from their infancy, showing remarkable *signature stereotypies*—individual peculiar mannerisms they developed as deprived infants (Novak et al., 1992).

All the evidence suggests that humans also are adversely affected by inadequate care in infancy. In fact, because of the greater complexity of their social and emotional development, human children may be even more vulnerable to early deprivation. As discussed in Chapter 2, studies in England and Eastern Europe have found a variety of negative consequences of early institutional rearing, including early physical and emotional problems, difficulties with peers in childhood and adolescence, and later problems in parenting (Dubrovina and Ruzska, 1990; Johnson, in press; Rutter, Quinton, and Hill, 1990). Parents, researchers, and policymakers have also wondered whether day care during infancy might have consequences for attachment formation. Current research findings on this issue are discussed in the box on page 220.

**Cultural Diversity and Common Humanity**

A consideration of infant development in cultures around the world suggests both great diversity and a core of commonality. There is diversity among cultures in styles of living, child-rearing goals, and particular behavior patterns (Bornstein et al., 1992; Hewlett et al., 1998; Richman, Miller, and LeVine, 1992). Yet caregivers in all cultures recognize the importance of providing consistent, responsive care for young infants. Japanese mothers direct their babies’ looking more to themselves than to objects and U.S. mothers do the reverse, but in both cultures mothers encourage babies to explore, imitate their vocalizations, and respond to their distress with nurturance (Bornstein et al., 1992). Mothers in Boston and in the Gusii tribe of Kenya both respond promptly to an upset baby, although the Gusii are more physically responsive and the U.S. mothers more verbally responsive (Richman, Miller, and LeVine, 1992).

Occasionally, variations in care have been shown to increase anxious attachment. For example, infants in an Israeli kibbutz who slept away from their mothers overnight were more likely to manifest resistant and disorganized attachment than other Israeli infants (Sagi et al., 1994). Cross-cultural variations in attachment must be interpreted with care. Infants in traditional Japanese families become extremely upset in the Strange Situation (Takahashi, 1990), but this does not mean these infants all have anxious-resistant attachments. Rather, they have almost no experience with separation, making Ainsworth’s procedure inappropriate for them.
APPLYING RESEARCH FINDINGS

DAY CARE IN INFANCY

Infant day care has generated controversy among child development researchers, partly because of the sensitive period hypothesis. When use of day care began to increase rapidly in the 1970s, there was concern that it might prevent attachment to parents by reducing opportunities for parent-child interaction. This concern has proven groundless. Children do become attached to day-care providers (Thompson, 1998), but they still become attached to their mothers or other primary caregivers, and in general these parental attachments remain more important (Segi et al., 1994; Sroufe, 1990). Infants or toddlers seldom grieve when they change day-care providers, but they do grieve when they lose a parent. As long as parents are children's primary caregivers outside of working hours, they become their children's central attachment figures.

A number of early studies found that babies who began full-time day care (more than twenty hours a week) before age 12 months were more likely to develop anxious-avoidant attachments to their mothers than babies who were raised at home, placed in part-time day care, or placed in full-time day care after 12 months (Belsky, 1980, Vaughn, Gove, and Egeland, 1980). One study (Vaughn et al., 1980) compared babies from economically disadvantaged homes who started full-time day care early (before 12 months of age), started it later (between 12 and 16 months), or were not placed in day care at all. At 12 months, 47 percent of those already in day care were classified as anxiously attached, and all of them displayed the anxious-avoidant pattern, which is associated with a parent who is physically or emotionally inaccessible. In contrast, only 28 percent of those who started day care later, and 18 percent of those not in day care had anxious-avoidant attachments. Factors such as socioeconomic status, stress level, or personality did not account for these results. Day care, however, cannot be seen as a direct cause of anxious-avoidant attachment.

After all, most babies become securely attached, even those who start day care early.

A newer study, including more than 1,200 children at multiple sites, obtained somewhat different results (NICHD, 1997). These investigators found no overall effect of day care on attachment. However, they found that parental sensitivity was related to anxious attachment and that this factor interacted with quality of day care. When home care was sensitive, day care had no apparent effect on attachment security. However, when poor-quality home care was combined with early, poor-quality day care, effects were more negative.

Thus, the increase in anxious-avoidant attachment among early-day-care infants may not be caused by early day care itself, but by a larger context of poor-quality care. Numerous studies have confirmed the importance of the quality of substitute care (e.g., Anderson, 1992; Van- dell and Garson, 1990). Carolee Howes (1990) found that low-quality day care was related to noncompliance, negative emotions, and hostility in preschoolers, and that entry into poor-quality day care before age 12 months added to these negative outcomes. Early, good-quality day care did not have such negative effects. Jay Belsky (1990), who has criticized early day care, has also concluded that it is the combination of early and low-quality day care that puts infants at risk.

Our review of the research leads us to conclude that both the timing and the quality of day care are important. Given the current evidence, we would favor more child care options for parents of young infants, so that full-time day care is not their only choice. Many countries, such as Sweden, are far ahead of the United States in providing leave from work for parents of young children. Beyond this, good-quality day care must become more widely available. At present, the millions of poor families in this country lack ready access to it (Children's Defense Fund, 1993).

The existence of other relationships for a child doesn't seem to weaken the cultural belief that early nurturing care from the mother is important. Among the Efe foragers in the Congo, for example, children have many relationships with kin, and by age 3 they spend 60 percent of their time with older children. However, up to age 2 they are primarily with their mothers, especially during the first eight months (Tronick, Morelli, and Ivey, 1992). In many cultures, mothers carry their infants at all times during waking hours and sleep with them at night (Hewlett et al., 1998; Morelli et al., 1992). Even when such constant physical proximity is not the case, as in the United States, caregivers typically respond promptly to infant distress. The universal recognition of the need for such responsive, consistent care in infancy suggests that it is vital for human adaptation.

The pervasiveness of some infant caregiving practices is a response to a common human endowment. Numerous studies show great similarity in infant emotional reactions and emotional development in the early months (Kislevsky et al., 1998; Sroufe, 1995). However, by the end of the first year, cultural differences in experience begin to have an
impact on emotional life. For example, by 11 months Chinese infants are less emotionally responsive to fear-inducing and frustrating experiences than Japanese or European-American infants, perhaps because of a tendency for Chinese families to value and encourage emotional restraint (Camras et al., 1998).

**Enhancing the Quality of Early Care**

The idea that early care is of special importance has inspired efforts to work with families in which infant development is going awry or seems likely to be problematic (Egeland et al., in press). In addition to being of great practical value in improving children’s lives, such early intervention is of theoretical importance because any long-term effects it produces support the sensitive period hypothesis. At the same time, successful interventions that start after the earliest months show that infants remain open to change.

Some intervention studies have identified at birth infants who are at risk for developmental problems. One large-scale study (discussed in the box on page 183) focused on low-birth-weight, premature infants (Gross, 1990; Spiker, Ferguson, and Brooks-Gunn, 1993). Families in the treatment group received comprehensive services, including home visits, child attendance at a preschool program, and parent group meetings. At 2 and 3 years, children in the intervention group showed cognitive gains and fewer behavior problems than those in a control group. These improvements were found primarily in families with low education; the intervention may have affected the children by helping their parents become better informed about age-appropriate behaviors and effective techniques for managing their children’s behavior, as well as by directly altering the children’s behavior.

Other studies have focused specifically on enhancing the quality of infant-caregiver attachment. Van den Boom (1989) provided extensive guidance for fifty low-income mothers of highly irritable newborns, aimed specifically at teaching the components of responsive care: perceiving and interpreting infant signals correctly, selecting an appropriate response, and implementing the response effectively. Compared with a control group, caregivers who received this intervention were indeed more responsive in the second half-year, and their infants were dramatically more likely to be securely attached (68% compared with 22%).

In another study, Alicia Lieberman and her colleagues (1991) worked with a group of low-income Hispanic mothers and their 12-month-old infants who were already anxiously attached. For one subgroup, staff members provided emotional support and were responsive to each mother’s own inner conflicts, with the aim of enhancing her empathy for the child’s
developmental needs and experiences. One year later, the researchers assessed mother-child interaction and the child's socioemotional functioning in relation to the mother. Compared with the anxiously attached control group, children in the intervention group were rated significantly lower in avoidance, resistance, and anger toward the mother and higher in partnership with her.

In a review of these studies, Byron Egeland and colleagues (Egeland et al., in press) noted that results of intervention studies have been inconsistent and reached the following conclusions:

- Interventions aimed at improving attachment relationships must be comprehensive, addressing the infant-caregiver relationship and the surrounding context.
- Intervention efforts must be intensive, lasting many months.
- Intervention should begin early, even before the end of pregnancy. This makes it possible to focus on life difficulties of the caregiver before the baby is born.

The Special Impact of Early Experience

All periods of development are important, but there is a way in which early experience has special significance. An analogy is building a house. All parts of the house are important. Without a frame there can be no roof, and without a roof any structure will soon deteriorate. But the entire building depends on a solid foundation. Similarly, basic expectations about oneself and the social world are laid down during infancy. Such expectations may guide later encounters with the world, coloring the experiences children seek and how they interpret them.

Psychoanalytically oriented researchers also argue that early experience is important because it cannot be readily brought to consciousness and examined, and therefore any ill effects from it may not be easily corrected (Bowlby, 1973). It is unlikely that the monkeys studied by Novak and colleagues (1992) remembered their early social deprivation, or that Fairbanks's (1989) monkeys remembered how they were mothered. Rather, patterns of behavioral and emotional regulation laid down in infancy were not erased by intervening experience but remained available when cued by an appropriate context.

Early experience, of course, does not determine the rest of development, and genuine change can always occur. Some children who receive inadequate early care ultimately follow a normal course of later development (Egeland, 1997; Grossmann and Grossmann, in press; Werner and Smith, 1992). Research suggests that such resilience in development is not due to inherent invulnerability; instead, like troubled behavior, it reflects developmental processes. It may be related to the timing of changes in experience, the quality of later experiences, or both. When there is a return to healthy development, it is sometimes the case that the early experience itself was not so bad, or the child had some positive experiences to draw on. The important point to remember is that if early deprivation is not extreme and prolonged, later change remains possible.

Chapter Summary

Introduction

Social and emotional development in the first year of life culminates in the formation of attachments between infants and caregivers.

Development in the First Six Months

Newborns have certain predispositions that preadapt them to social interaction:

- the ability to signal psychological and physiological needs;
- the capacity to detect contingencies in the environment;
- the tendency to be attracted to social stimuli, including human faces and voices; and
- the inclination to fall in step with the caregiver's behavior.

Reciprocity in social interaction develops gradually. At first caregivers orchestrate social dialogues, ideally providing sensitive care. Infants' involvement in social encounters becomes increasingly complex until they are full partners in social interactions.

The development of social smiling follows a predictable timetable: