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CHAPTER 4

Individual Differences in Infant–Caregiver Attachment
Conceptual and Empirical Aspects of Security

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Almost every infant will develop an attachment relationship with a caregiver, and will endeavor to use that caregiver as a source of comfort and reassurance in the face of challenges or threats from the environment. The presence of attachment relationships in human infant–caregiver relationships seems to be universal. The nature of the relationship and the effectiveness with which the caregiver can be used as a source of comfort in the face of danger, however, differ across infant–caregiver dyads. These variations are individual differences in the quality of attachment relationships.

This chapter describes the nature of individual differences in infant–caregiver attachment as John Bowlby and Mary Ainsworth conceptualized it. It reviews how individual differences are described and assessed in infancy, as well as the meaning of attachment classification as an assessment of relationship history. This chapter also discusses core theoretical predictions regarding the meaning of individual differences in early attachment relationships for subsequent child adjustment and relationship functioning. Empirical findings are reviewed supporting these predictions, drawn from the findings of our own research on the Minnesota Parent–Child Project, a longitudinal study of children at high risk for poor developmental outcomes; from a Minnesota longitudinal study of middle-class families; and from other independent longitudinal studies.

INDIVIDUAL DIFFERENCES IN ATTACHMENT: DEVELOPMENT AND DEFINITIONS

The distinction between the presence of an attachment relationship and the quality of an attachment relationship is important. According to Bowlby, a human infant will form an attachment to a caregiver as long as someone is there to interact with the infant and to serve as an attachment figure. Forming attachments is strongly built into the human repertoire through evolution. Children will be unattached only if there is no stable caregiver, such as is the case in certain kinds of institutional rearing. For all others, even those who are mistreated, attachment relationships are formed with caregivers.

Individual differences in these attachment relationships reflect differences in the history of care. They do not arise suddenly, nor are they carried solely in the traits of the infant or the caregiver (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1969/1982; Sroufe & Waters, 1977). Pat-
Individual differences in quality of attachment relationships have been broadly divided into two categories: "secure" attachment relationships and "insecure" attachment relationships (Ainsworth, 1972; Ainsworth et al., 1978; Bowlby, 1973). The terms "secure" and "insecure" do not describe simply the manifest behaviors of the infant within the attachment relationship. Rather, the terms describe an infant's apparent perception of the availability of the caregiver if a need for comfort or protection should arise, and the organization of the infant's responses to the caregiver in the light of those perceptions of availability.

Security of attachment does not mean that an infant never feels fear or apprehension (Bowlby, 1973). Fear and anxiety are normal human reactions, and all infants will occasionally feel unsettled or fearful of something in the environment. Such reactions are adaptive because they prompt proximity to the protective caregiver, as well as movement away from the source of threat. Security in the attachment relationship indicates that an infant is able to rely on that caregiver as an available source of comfort and protection if the need arises. Infants with secure attachment relationships may direct few attachment behaviors toward their caregivers when there are no threats in the environment. When threat-based feelings of apprehension arise, however, infants in secure relationships are able to direct attachment behaviors to their caregivers and take comfort in the reassurance offered by them. Secure relationships promote infants' exploration of the world and expand their mastery of the environment, because experience tells such infants that if the exploration proves unsettling, they can rely on their caregivers to be there and alleviate their fears. Infants with secure attachment relationships are confident in the sensitive and responsive availability of their caregivers, and consequently these infants are confident in their own interactions with the world.

This confidence is not instilled by the experiences of infants who have insecure attachment relationships with their caregivers. Infants with insecure attachment relationships have not experienced consistent availability of comfort from their caregivers when the environment has proven threatening. Bids for attention may have been met with indifference, with rebuffs, or with notable inconsistency (Ainsworth et al., 1978; Bowlby, 1973). The result of such histories is that these infants are anxious about the availability of their caregivers, fearing that the caregivers will be unresponsive or ineffectively responsive when needed.
They may also be angry with their caregivers for this lack of responsiveness. Anger seems to be a normative reaction to inaccessibility of caregivers, similar to that which occurs in prolonged separation (Roberton & Robertson, 1971). Bowlby (1973) speculated that angry reactions might have evolved because they punish caregivers for unresponsiveness, and may be intended to discourage caregivers from further unresponsiveness.

A history of unresponsiveness or erratic responsiveness results in infants' being unable to direct attachment behaviors at caregivers when doing so would be appropriate. When there is no apparent danger in the environment, some infants with insecure attachment relationships may still direct many attachment behaviors to their caregivers, reflecting a constant low-level anxiety about the caregivers' availability. When there is a perceived threat from the environment and anxiety is high, some infants may not be able to direct appropriate attachment behaviors to their caregivers, or may not be easily comforted by caregivers who have been unreliable in the past. Because insecurely attached infants are not free to explore the environment without worry, they cannot achieve the same confidence in themselves and mastery of their environments that securely attached infants can.

Insecure attachments are nonoptimal organizations of attachment behaviors because they can compromise exploration. At the same time, patterns of insecure attachment may be viewed as adaptations, in that they are suitable responses to the unresponsiveness of the caregivers. Main and Hesse (1990), for example, argue that establishing a low threshold for threat can be described as "maximizing" expressions of attachment even in low-threat situations. This may ensure that inconsistent caregivers will be available if genuine threat should occur. Alternatively, some infants can be described as "minimizing" expressions of attachment, even in conditions of mild threat. This may forestall alienating caregivers who are already rejecting, and it may leave open the possibility of responsiveness if a more serious threat should arise.

Within the theoretical tradition of Bowlby and Ainsworth, all infants are viewed as adapting their attachment behavioral systems to the caregiving environment at the same time as the environment adapts to them. In a proximal sense, both secure and insecure attachments can be considered adaptive: They promote proximity to caregivers, and consequently promote survival past the vulnerable period of infancy and to the age of reproductive maturity. In purely evolutionary terms, secure and insecure attachments are both distally adaptive as well, in that neither pattern should compromise reproductive success (Stroff, 1988). In nonevolutionary terms, however, there are ways in which a history of insecure attachment may compromise an individual's subsequent development.

DESCRIPTIONS AND ASSESSMENTS OF INDIVIDUAL DIFFERENCES IN ATTACHMENT SECURITY

It is not possible to observe directly the conscious and unconscious processes that guide the infant's responses within the attachment relationship. And as mentioned previously, observing the number of attachment behaviors expressed in a given situation is insufficient, because infants with insecure attachment relationships may not be making attachment-related overtures to their caregivers in an adaptive fashion. The key to assessing attachment rests in determining how an infant organizes attachment behaviors to balance the need for protection and comfort with the desire to explore the environment.

The Strange Situation (Ainsworth et al., 1978; Ainsworth & Wittig, 1969) was the method Ainsworth developed for assessing the infant-caregiver attachment relationship, and it has become the standard by which measures at later ages are judged. The Strange Situation is so named because it is intended to be a mildly to moderately stressful experience for an infant, akin to an experience in a doctor's office waiting room. It introduces several strange and therefore stressful elements to an infant—a laboratory context that is unfamiliar, an unfamiliar adult who interacts with the child, and two brief separations from the mother. The premise of the situation is that the multiple increasing stressors will activate the infant's attachment behavioral system, and that individual differences in the child's expectations about the availability of the caregiver will thus be revealed. The situation also reveals the infant's ability to balance exploration of a new environment with a need for reassurance from the caregiver (see Solomon & George, Chapter 18, this volume, for a detailed discussion of the Strange Situation).

Based on the pattern of interactive behavior across the session and especially the two re-
unions, each relationship is classified as “secure,” “avoidant,” or “resistant” (Ainsworth et al., 1978). An additional classification, “disorganized/disoriented,” is now also used because some infants exhibit unusual behaviors that seem to represent breakdowns in the organization of attachment behavior, or that reflect striking episodes of disorganization (Main & Solomon, 1990; see also Solomon & George, Chapter 18, and Lyons-Ruth & Jacobvitz, Chapter 28, this volume). Such infants, like avoidant and resistant infants, are considered insecurely attached.

Infants classified as secure with their caregivers in the Strange Situation are able to use the caregivers as a secure base for exploration in the novel room. An infant may check back with a caregiver, but usually engages in the toys. Upon separation the infant may be overtly distressed, and play may become impoverished. A secure infant may be friendly with the stranger, and may even be somewhat comforted by the stranger during separation, but there is a clear preference for comfort by the caregiver. Upon reunion with the caregiver, a distressed secure infant will seek proximity or contact with the caregiver, will be readily comforted by the proximity or contact, and will maintain contact as long as it is needed. Eventually, most secure infants will return to play. Even when not distressed, a secure infant is responsive to the caregiver's return, greeting with a smile or vocalization and initiating interaction.

Infants classified as avoidant with their caregivers will usually engage with the toys in the presence of their caregivers. These infants are unlikely to show affective sharing (e.g., smiling or showing toys to the caregiver) before the first separation, although they may engage the caregiver for instrumental assistance (Waters, Wippman, & Stroufe, 1979). Upon separation the infant is unlikely to be distressed, although some distress when left alone is possible. Avoidant infants tend to treat the stranger similarly to the caregiver, and in some cases the infants are actually more responsive with the stranger. Upon reunion with the caregiver, avoidant infants show signs of ignoring, looking or turning away from, or moving past the caregiver rather than approaching. If picked up, avoidant infants will make no effort to maintain the contact.

Infants classified as resistant with their caregivers are conspicuously unable to use their caregivers as a secure base for exploration of the novel setting. These infants may seek proximity and contact with the caregivers even before separation occurs, and may be quite wary of the situation and of the stranger. Upon separation resistant infants are likely to be quite distressed, and are not easily calmed by the stranger. Upon reunion they are likely to want proximity or contact with their caregivers, but not to be calmed by the contact. Some resistant infants display unusual passivity, continuing to cry but failing to seek contact actively. In most cases, however, the hallmark of this classification is seeking contact and then resisting contact angrily once it is achieved. There is a palpable ambivalence in many of these relationships.

An infant who is classified as disorganized in the Strange Situation (in addition to an alternate, best-fitting classification of secure, avoidant, or resistant) exhibits conflicting, contradictory, or disoriented behaviors that indicate an inability to maintain one coherent attachment strategy in the face of distress (Main & Solomon, 1990). Disorganization can manifest itself in a variety of ways, including, but not limited to, behaviors such as behavioral stilling, stereotypes, or direct fear of the parent.

Waters and Deane (1985) developed an Attachment Q-Sort that uses extended observations of the home behavior of children as indicators of attachment. The procedure does not result in attachment classifications, but rather a continuous score for security based on home behaviors that are relevant to attachment and that should discriminate between secure and insecure attachment. Vaughn and Waters (1990) found that infants who were secure with their mothers in the Strange Situation had significantly higher security scores on the Attachment Q-Sort when the sort was completed by observers, confirming the link between home behavior and Strange Situation classification. (The Attachment Q-Sort is addressed in greater depth by Solomon & George, Chapter 18, this volume.)

THEORETICAL PREDICTIONS REGARDING INDIVIDUAL DIFFERENCES IN ATTACHMENT

Bowlby (1969/1982, 1973) proposed two major hypotheses regarding individual differences in attachment. The first addressed antecedents of individual differences in attachment. Bowlby defined security of attachment in terms of preferential desire for contact with the caregiver under conditions
of threat, and secure-base behavior more generally. He viewed both as outgrowths of a child's confidence in a caregiver's responsiveness. Through a history of responsive care, infants develop expectations (or, in Bowlby's terms, "internal working models") of their caregivers' likely responses to signs of distress or bids for contact. The specific prediction, then, is that caregiver responsiveness early in infancy is related to individual differences in attachment security later in infancy. In the simplest terms, Bowlby postulated that what infants expect is what has happened before. (See Belsky & Feinman, Chapter 13, this volume, for further discussion of the antecedents of individual differences in attachment.)

Bowlby's second hypothesis concerned the likely consequences of individual differences in attachment security for a child's development, particularly social and personality development (Bowlby, 1973). Bowlby argued that because attachment relationships are internalized or represented, attachment experiences and consequent expectations get taken forward to serve later behavioral and emotional adaptation, even in totally new contexts and with different people. In particular, internal working models are a foundation not only for expectations concerning the self, but also for later relationships with caregivers and noncaregivers alike. Caregiver responsiveness (and the ensuing confidence in that responsiveness) is more than a foundation for the developing parent–child relationship. The model of parent as responsive is inextricably associated with a complementary model of the self as effective, since the child is predictably effective at eliciting a parental response. This pattern of responsiveness also generalizes to the belief that relationships are a context in which needs are met. Thus there are implications for later efficacy, self-esteem, and social relationships. (See Thompson, Chapter 16, this volume, for further discussion of links between infant attachment and later social functioning.)

This is not meant to imply that early attachment relationships are destiny. In Bowlby's (1973) view, adaptation always depends both on the prior history of adaptation and on current circumstances, with established patterns influencing selection and interpretation of, and reactions to, the environment. Current experiences are capable of transforming adaptation and subsequent expectations, while not erasing the influence of history. Bowlby adapted Waddington's (1957) pathway model to argue both that change is always possible, and that change is at the same time constrained by prior adaptation.

These issues are elaborated in the sections to follow. We then conclude with a discussion of current issues in the arena of individual differences in attachment, including when attachment-based differences are not expected.

Antecedents of Individual Differences in Attachment Security

Research on Bowlby's first hypothesis—that individual differences in attachment arise from experiences and expectations regarding the availability of caregivers—was pioneered by Ainsworth, who was the first to provide a formal description of individual differences in infants' attachment security. Inspired by Bowlby's theory and her own etiological observations of caregiving practices and infant behavior in Uganda (Ainsworth, 1967), Ainsworth and her research team began by making hours of detailed observations of exploratory behavior, crying, and other attachment-related behaviors in the home for a small sample of infants. She also developed carefully crafted, behaviorally anchored rating scales for caregiver behavior: Sensitivity to Signals, Cooperation–Interference, Acceptance–Rejection, and Availability–Unavailability. Thus, Ainsworth established anchors in attachment behavior in the home, as well as in assessments of caregiver sensitivity, before developing the Strange Situation. This impressive and methodical pursuit of validation against home behavior was an essential first step in the development of the laboratory-based Strange Situation.

Ainsworth and colleagues (1978) reported extensively on the home behaviors of their participants over the first year of the infants' lives leading up to the Strange Situation. Although the full sample size used for the development of the Strange Situation coding procedures was 106 dyads, the more intensive study of home behavior was undertaken only for a subsample of 23 dyads. In general, small sample sizes reduce the likelihood of finding significant between-group differences. The fact that Ainsworth and her colleagues found group differences despite the small sample size attests to the magnitude of the differences. They found that infants who would later be classified as insecurely attached (avoidant and resistant) with their mothers in the Strange Situation were more overtly angry and noncompliant and cried more at home than infants who would later be
classified as secure. Mothers of infants who would later be classified as insecure were less sensitive in interactions, more interfering with the children's behavior, and less responsive to the children's bids than mothers of infants who would later be classified as secure. In addition, mothers of infants who would later be classified as avoidant expressed an aversion to physical contact with their infants and expressed little emotion during interactions with them.

Numerous others have replicated the core findings of a relation between caregiver insensitivity and later insecure attachment (Bates, Maslin, & Frankel, 1985; Grossmann, Grossmann, Spangler, Sues, & Unzner, 1985; Isabella, 1993; Kiser, Bates, Maslin, & Bayles, 1986; National Institute of Child Health and Human Development [NICHD] Early Child Care Research Network, 1997; Pederson, Gleason, Moran, & Bento, 1998; Posada et al., 1999). In the Minnesota Parent-Child Project, Egeland and Farber (1984) found that mothers of infants who would later be classified as secure were more sensitive and expressive during a feeding situation than mothers of avoidant or resistant infants. Mothers of avoidant infants were insensitive to their infants' timing cues and seemed to dislike close physical contact with their infants. The magnitude of the relation between caregiver sensitivity and attachment security is often modest, especially when compared to the findings in Ainsworth and colleagues' (1978) original study, and there have been occasional nonreplications (e.g., Seifer, Schiller, Smeroff, & Resnick, 1996). Some of the problems in replicating these findings may be found in the difficulty of devising a good measure of caregiver sensitivity, as well as in the different numbers of hours of home observation that form the basis for the different sensitivity measures. Despite some variability in findings, a meta-analysis did find a significant relation between sensitivity and attachment (De Wolff & van IJzendoorn, 1997). In addition, the large multisite NICHD Study of Early Child Care and Youth Development (NICHD SECCYD), although finding little impact of day care on attachment, supported the significance of caregiver sensitivity in predicting individual differences in attachment (NICHD Early Child Care Research Network, 1997).

The finding that infant home behavior during the first year of life is related to later Strange Situation classification led to the suggestion that attachment classification could be a simple manifestation of infant temperament, and not a product of the relationship. Direct comparisons of temperament and attachment, however, have suggested that there is not in fact a direct link between temperament and attachment security (Belsky & Rovine, 1987; Crockenberg, 1981; Egeland & Farber, 1984; Gunnar, Mangelsdorf, Larson, & Herrgaard, 1989; Seifer et al., 1996; Vaughn, Lefever, & Baglow, 1989; see Vaughn, Rost, & van IJzendoorn, Chapter 9, this volume). Research has demonstrated that what can be predicted by temperament are specific behaviors during the Strange Situation, particularly distress during separation from, but not during reunion with, the mother (Gunnar et al., 1989; Vaughn et al., 1989). These findings bolster the suggestion that the attachment relationship is not reducible to infant characteristics, and that attachment and temperament represent two distinct constructs (Mangelsdorf & Froch, 2000).

Other researchers have sought to explain the relation between temperament and attachment by looking at the interaction of maternal and infant characteristics. Although Crockenberg (1981) found no direct relation between infant temperament and attachment classification, she did find a significant interaction between maternal social support and infant temperament in predicting attachment classification. Mothers with irritable infants (as assessed shortly after birth) and poor social support were more likely to have insecurely attached infants. When social support was high, infant irritability had no impact on attachment quality. Mangelsdorf, Gunnar, Kestenbaum, Lang, and Andreas (1990) explored infant temperament and maternal personality in relation to attachment. Like previous researchers, they found no direct relations between temperament, or personality, and attachment; however, they did find a significant interaction. Infants who were highly prone to distress and had mothers who were rigid and traditional were most likely to be insecurely attached. In the Minnesota Parent-Child Project, Susman-Stillman, Kalkoske, Egeland, and Waldman (1996) found that maternal sensitivity during the first year of life predicted attachment security, that infant temperamental characteristics predicted type of insecure attachment, and that maternal sensitivity mediated the link between infant irritability and attachment security. Thus, although some of the behaviors seen in the Strange Situation may be related to temperament, security in the infant-caregiver relationship is not determined by
Predictive Meaning of Individual Differences in Attachment Security

Bowlby’s second hypothesis concerns the developmental significance of individual differences in early attachment relationships. This hypothesis includes the nature of meaningful variations in infant–caregiver attachment; the aspects of development they affect; and the processes by which this effect occurs.

Bowlby described two types of variation in attachment: presence versus absence of an attachment relationship, and individual differences in organization of secure-base behavior across infant–caregiver dyads. Although absence of attachment is likely to affect survival, Bowlby did not predict that individual differences in attachment security should influence survival. Both secure and insecure patterns of attachment serve to promote survival to reproductive maturity by keeping infants in proximity to their caregivers.

Individual differences in attachment security, although of their impact on emotion regulation and exploration, are nonetheless conceptualized as important both for social and personality development and for psychopathology. Bowlby argued, as Freud had previously, that early attachment experiences are of special importance because of their implications for mastery, emotion regulation, and interpersonal closeness. Rejecting the notion of drive reduction, Bowlby expanded on Freud’s original focus on the role of actual experience. Bowlby elaborated on the idea of an internal world of mental processes as central to the ongoing influence of early history (Strofue, 1986). Expectations about oneself and the social world, according to Bowlby, are based on the quality and patterning of early care. From a history of responsive care and smooth dyadic emotion regulation comes a sense of efficacy, a capacity for self-regulation, and positive expectations regarding interpersonal relationships. Within this developmental process, the individual is viewed as active—adapting, coping, and shaping his or her own experiences.

There are at least four possible explanations of why early attachment relationships influence later development. These explanations are not mutually exclusive, and it is likely that each plays a part in the continuing influence of attachment. First, it is possible that the experiences within the early attachment relationship influence the developing brain, resulting in lasting influences at a neuronal level (Schore, 1994). This possibility, though compelling and a promising area of future research, is not a focus of the present discussion (see Cicchetti & Tocker, 1994).

Second, as suggested by Isabella (1993), Cassidy (1994), and Strofue (1979, 1996), the early attachment relationship may serve as a foundation for learning emotional self-regulation. Emotion regulation denotes the ability to control and moderate emotional responses, coping with arousal in order to maintain a motivating, but not debilitating, level of emotion (Cole, Martin, & Dennis, 2004). Infants are ill equipped to regulate their own emotions, so as they experience such emotions as distress, anger, and fear, they turn to their caregivers for assistance. Tronick (1989) detailed a process of coordination, miscoordination, repair, and recoordination of emotion that cycles within well-functioning infant–caregiver dyads. This process of miscoordination and caregiver-driven repair gives the infant guided experience with managing stressful emotions and provides a foundation for self-regulatory abilities. Individual differences in attachment relationships should give infants repeated experiences with predictable patterns of coregulation of emotion (Thompson, 1994), and these experiences should lead to predictable patterns of self-regulation. According to theory regarding organized patterns of attachment (Cassidy, 1994; Strofue, Egeland, Carlson, & Collins, 2003a), infants in secure relationships should be flexible in their self-regulation strategies in the face of negative emotion, and their mothers should be accepting of a wide range of emotional expressions. Infants in insecure-avoidant relationships should minimize direct expressions of distress, and have poor regulation skills in the face of such emotions, due to experience with caregivers who reject such expressions. Infants in insecure-resistant relationships should maximize expressions of distress, and manage these emotions poorly, due to experiences with caregivers who respond erratically to bids and therefore respond more predictably to amplified emotions. Disorganized attachment, which represents a breakdown in attachment strategies, should predict an absence of predictable emotional strategies, and thus the most poorly managed emotions (DeOliveira, Bailey, Moran, & Pederson, 2004; Lyons-Ruth & Jacobvitz, Chapter 28, this volume). Empirical research has supported some of these propositions (Berlin & Cassidy, 2003; Denham, Blair, Schmidt, & DeMulder, 2002; Dienzer,
fluence the design influences at this possibility, an area of future research discussion isabella (1993), 1996), the early formation. Emotion control and modulation of arousal within a relationship. The sensitive, responsive behavior of the caregiver in a secure dyad teaches the secure infant that communication is contingent upon each partner's cues and responses. The insensitive, uncoordinated interactions of an insecure dyad teach the insecure infant that communication is not a responsive interaction, but a series of poorly coordinated bids and responses. All infants carry forward not only the expectations of how interactions with social partners are coordinated, but also their experiences with caregivers in succeeding or failing to construct synchronous, reciprocal social and emotional exchanges. Secure children develop such abilities as self-control and behavioral reciprocity, which result in more skilled interactions than those of insecure children. These interactional skills can then be applied to new settings and new relationships, resulting in continued differences that are reinforced and strengthened across development.

The fourth way in which individual differences in attachment influence later development is through representation. According to Bowlby (1969/1982), from the early attachment relationship the child begins to represent what to expect from the world and from other people, as well as how he or she can expect to be treated by others. These beliefs and expectations, or "internal working models," begin in the relationship with the caregiver as the infant starts to anticipate caregiver responses to the infant's signals. Infants who have secure relationships have been treated in a consistently sensitive manner. They grow to see the world as good and responsive, and the self as deserving such consideration. Infants who have insecure relationships are responded to harshly, erratically, or not at all. They grow to see the world as unpredictable and insensitive, and the self as not deserving better treatment. These internal working models are then carried forward to new relationships and new experiences, guiding children's expectations and behavior. In Bowlby's terms (1973, 1980), the environment is engaged within the confines of models of self, other, and relationships that have been previously formulated. (See Bretherton & Munholland, Chapter 5, for a detailed discussion of internal working models.)

There are specific predictions regarding individual differences in early attachment quality and later outcomes. Particular patterns are expected to have particular correlates, in terms of social behavior, personality, and psychopathology. Moreover, not all developmental outcomes, whether of good or poor quality, are viewed as related to attachment history. As we discuss later, many outcomes are viewed as independent of the attachment system.

Theory dictates that the influence of infant attachment relationships should be principally apparent in some specific domains of adjustment. These domains include dependency, self-reliance, and efficacy; anxiety, anger, and empathy; and interpersonal competence (Ainsworth, 1972; Ainsworth & Bell, 1974; Bowlby, 1969/1982, 1973, 1988; Sroufe, 1988; Sroufe & Fleeson, 1986, 1988). These issues should be specifically related to attachment because they are intricately connected to the emotion regulation, behavioral reciprocity, and expectations and beliefs about self and other that arise from early attachment relationships. Theoretical predictions and empirical findings follow not only from individual differences in secure versus insecure attachment, but also in some cases from more specific individual differences between those with a history of avoidant attachment and those with a history of resistant attachment (and, in some cases, those with a history of disorganized attachment).

In the following section, we review empirical predictions from individual differences in infant attachment to theoretically relevant dimensions of behavior in childhood and adolescence.

**EMPIRICAL STUDIES OF INFANT ATTACHMENT AND LATER ADAPTATION**

**Dependency, Self-Reliance, and Efficacy**

Infants whose caregivers are sensitive and responsive to cues learn that they can influence the world around them, successfully getting their needs met and having an effect on the world. They acquire the experience and confidence to function autonomously. Infants whose caregivers are unrespon-
sive or erratically responsive to cues that they are not able to influence the world to meet their needs. Consequently, these infants do not acquire the confidence to function autonomously (Ainsworth & Bell, 1974; Smoue, Fox, & Pancake, 1983). This prediction regarding the development of self-reliance was a cornerstone of Bowlby's theory (Bowlby, 1973).

When the attachment construct was first introduced, it was necessary for researchers to differentiate between attachment and dependency (Ainsworth, 1969, 1972; Bowlby, 1969/1982; Smoue et al., 1983). Because attachment behavior and signs of dependency are similar (e.g., crying, clinging, seeking proximity), attachment quality was misunderstood to be a measure of dependency (Gewirtz, 1972). Some secure infants were mistakenly thought to be dependent, whereas avoidant infants were thought to be precociously independent. In Bowlby's view, however, it is not possible for an infant to be either too dependent or truly independent. Because of their immaturity and inability to care for themselves, infants may be effectively or ineffectively dependent.

The key to the relation among infant attachment, dependency, and self-reliance has been articulated by Smoue and colleagues (1983), who explained that infants who are effectively dependent will consequently become effectively independent. Signaling needs to sensitive and responsive caregivers and having those needs met will lead infants to develop confidence in their ability to influence the world and achieve their goals. This confidence allows children with secure histories to function autonomously and with a belief that they will be successful in their efforts. Several studies have examined the relations between attachment and dependency, and between attachment and environmental mastery.

In the Minnesota Parent–Child Project, dependency has been studied in preschool, middle childhood, and adolescence. Smoue and colleagues (1983) and Smoue (1983) studied dependent behavior in preschool. "Dependency" was defined primarily in terms of seeking attention and proximity to the teacher, extreme reliance on the teacher for help, and seeking teacher attention at the expense of peer relations. Data were obtained through multiple methods, including observer data and teacher rankings and Q-sort. Children with resistant or avoidant histories, as compared to children with secure histories, had more interactions with teachers, sat next to them more often during circle time, and were judged to be more dependent overall. Children with secure histories did seek teacher attention, but they tended to seek attention in positive ways, and not at the expense of peer relations. Dependency was later studied in this sample at age 10 in a summer camp context by Urban, Carlson, Egeland, and Smoue (1991), who assessed dependency through camp counselor ratings and observer data on contact sought with adults. As in the preschool context, they found that children with insecure histories, both resistant and avoidant, were rated as more dependent. Children with secure histories sought less contact with adults at the camp overall.

Differences continued to be manifest at age 15, the latest age at which dependency was examined in the Minnesota Parent–Child Project (Smoue, Carlson, & Shulman, 1993). Both those adolescents with histories of resistant attachment and those with histories of avoidant attachment continued to show more dependency on adults than those with secure histories. This finding held even when variance attributable to contemporary parenting measures was taken into account.

Confidence, belief that one can succeed, and tolerance of frustration in goal seeking have also been studied in relation to early attachment history. In the Minnesota studies, this took the form of studying ego resilience, or a child's ability to respond flexibly to the changing requirements of a situation, particularly in the face of frustration. In the Parent–Child Project, children with secure histories were rated by their preschool teachers as more ego-resilient than children with insecure attachment histories (Smoue, 1983). Most striking was the fact that there was no overlap in ego resilience between the secure and avoidant groups.

These dimensions of efficacy were also explored in the Minnesota study of middle-class families. At 2 years old, children and their mothers were seen in a tool use situation. Matas, Arend, and Smoue (1978) found that children with secure histories appeared more competent in the tool use tasks than those with insecure histories, showing more enthusiasm, compliance with maternal directives, and persistence. When these children were in preschool, Arend, Gove, and Smoue (1979) found the same relation between attachment and ego resilience that would later be replicated in the Parent–Child Project. Children with secure histories were judged to be more ego-resilient than their insecure counterparts in a teacher Q-sort.

Other studies have explored these efficacy constructs as well. Frankel and Bates (1990), in a replication of Matas and colleagues (1978), found
that toddlers with secure histories were more persistent in a task than were children with insecure histories. In an Israeli kibbutz study of attachment between young children and their metaplot (the primary caregivers in a kibbutz children's house), Oppenheimer, Sagie, and Lamb (1988) found that children who had secure histories with their metaplot were described (by their metaplot, in Q-sorts) as more goal-directed and achievement-oriented than children with insecure-resistant histories. In a German study of interaction with a stranger, Lükenhaus, Grossmann, and Grossmann (1985) looked at 3-year-old children's responses to playing a competitive game with an unfamiliar experimenter. When the children saw that they might be failing, those with secure histories increased their efforts, whereas those with insecure histories decreased their efforts. This finding was interpreted as indicating that the children with secure histories believed they had more control over their environments and could succeed by using their skills if they tried.

Overall, these findings on dependency, self-reliance, and efficacy suggest that early attachment history does contribute to a child's growing effectiveness in the world. Children with secure histories seem to believe that, as was true in infancy, they can get their needs met and achieve their goals through their own efforts and bids. In contrast, children with insecure histories seem to believe that, as in their early attachment relationships, their efforts are often ineffective, and they must rely extensively on others who may or may not meet their needs. These beliefs are translated into both differences in effort and differential success in affecting the world.

**Anxiety, Anger, and Empathy**

Chronic rejection by and inconsistent availability of the caregiver, which are characteristic of insecure attachment, take their toll on an infant over the course of development. Unlike a secure infant, who can count on the responsiveness of the caregiver, an insecurely attached infant must deal with the constant possibility of needing an unavailable caregiver, as well as coping with the accumulating frustration and dysregulation inherent in being treated insensitively (Bowlby, 1973).

According to Bowlby (1973) and Stayton and Ainsworth (1973), insecurely attached infants must be constantly concerned about the whereabouts of their caregivers, because the caregivers cannot be relied upon to be accessible in times of need. Because of the potential unavailability of the caregivers, these infants live with the constant fear of being left vulnerable and alone. This fear of separation or abandonment continues beyond infancy, because the fear of being alone when comfort or protection is needed continues throughout childhood and adulthood (Bowlby, 1973). Thus the anxiety associated with this fear of separation lasts beyond infancy as well. Such anxiety should be particularly characteristic of individuals with resistant attachment histories, because these relationships are characterized by an unpredictable, erratic responsiveness that can prove particularly anxiety-provoking and can give rise to a coping strategy centered on chronic vigilance (Bowlby, 1973; Cassidy & Berlin, 1994).

Another response to unavailable, rejecting caregiving is anger. Some anger is a natural response to the fear engendered by separation from the attachment figure, because it serves to express displeasure over the separation and to prevent it from recurring (Bowlby, 1973). Chronic anger as a response to chronic unavailability, however, can be highly maladaptive and manifest itself through angry, aggressive behavior toward the caregiver. When the expectation of being hurt, disappointed, and afraid is carried forward to new relationships, the insecure infant becomes an angry, aggressive child. Avoidant infants, who are chronically rejected, and disorganized infants, who are conflicted in the face of frightened or frightening caregivers, are the most likely to show these angry, aggressive responses later (Ainsworth et al., 1978; Bowlby, 1973, 1980; Lyons-Ruth, Alpern, & Repacholi, 1993; Renken, Egeland, Marvinney, Mangelsdorf, & Sroufe, 1989).

Empathy is in many ways the complement or counterpoint to aggression. Whereas aggression often reflects an alienation from others, empathy reflects an amplified connectedness, and whereas aggression reflects a breakdown or warping of dyadic regulation, empathy reflects heightened affective coordination. In fact, in many ways aggression is dependent upon a lack of empathy or emotional identification with others.

Attachment theory makes a strong prediction with regard to the development of empathic capacity. Given that not only role but basic properties of relating are learned within the attachment relationship (Sroufe & Fleeson, 1986), the responsiveness that underlies security is also predicted to give rise to empathy. Earlier we have argued, following Bowlby, that consistently providing for infants' needs does not condemn them to perpetual
dependency, but in fact serves as a springboard for self-reliance because it instills a sense of efficacy concerning the environment. Similarly, being consistently nurtured and responded to empathically leads not to a spoiled, self-indulged child, but rather to an empathic child. All children learn about the patterning of relating and dyadic emotion regulation through experience. Those whose caregivers are responsive to their needs learn that when one person is needy, the other responds with assistance; when one person is emotionally overaroused, the other provides comfort or reassurance. All that these children require are the cognitive advances necessary to play the more mature role. Recapturing experienced patterns of dyadic interaction and regulation is a natural tendency. For some, particularly those with secure attachment histories, this gives rise to the capacity for empathy. Empirical studies on anxiety, anger, and empathy and their relation to infant attachment are reviewed below.

Both in laboratory assessments and in school settings, children with histories of resistant attachment have been found to be less observant and more anxious than those with either secure histories or avoidant histories. For example, using Banata's (1970) curiosity box situation at age 4½, Nezworski (1983) found the resistant group to be more hesitant about engaging this novel object than either the avoidant or the secure group. In elementary school, children with resistant histories were identified by their teachers as more passive and withdrawn than children with secure or avoidant histories (Renen et al., 1989). In addition, 6-year-old children with insecure attachment histories, and particularly those with resistant histories, reported higher levels of separation anxiety than did children with secure histories (Dallaire & Weinraub, 2005). Further data on more extreme anxiety symptoms are reported in the section on psychopathology.

Anger and aggression, as related to attachment history, have been examined in several samples. In the Minnesota Parent-Child Project, angry and aggressive behavior was assessed in preschool and in elementary school. During preschool, teacher Q-sorts and detailed behavioral coding by observers indicated that more negative affect, anger, and aggression were expressed by children with insecure attachment histories than by those with secure histories. Q-sort data from elementary school teachers yielded the same results (Sroufe, 1983; Sroufe, Schork, Mosti, Lawroski, & Lafreniere, 1984).

Another analysis in the same sample revealed differences between those with avoidant and resistant histories. Troy and Sroufe (1987) observed children in the preschool setting who were assigned to play pairs based on attachment history. Analysis of the interactions between the children in each pair revealed a systematic relation between victimization and attachment. Children with avoidant histories were significantly more likely than other children to victimize their play partners. Children with secure histories were never either victimizers or victims, whereas children with resistant histories were likely to be victims if they were paired with children with avoidant histories.

Research in other samples has replicated these findings on anger and aggression. In a study examining peer interaction in preschool in relation to attachment history in a German sample, Susse, Grossmann, and Sroufe (1992) found that children with avoidant attachment histories exhibited more hostility and scapegoating of other children than did children with secure histories. In the NICHD SECCYD sample, 36-month-old children with avoidant histories showed more instrumental aggression when interacting with a friend than did children with either secure or resistant histories (McElwain, Cox, Burchinal, & Macfie, 2003).

In the middle-class Minnesota sample mentioned previously, differences as a function of attachment history were found in expressions of anger and aggression toward mothers at 2 years of age (Matas et al., 1978). Matas and her colleagues found that children with insecure histories were more likely than children with secure histories to display aggressive behavior toward their mothers during a tool use task. These findings were replicated by Frankel and Bates (1990), using the same procedure in an independent sample. Interestingly, no difference in aggression was found between the groups with avoidant and resistant histories when the aggression was directed at mothers rather than peers.

A history of disorganized attachment is also related to angry and aggressive behavior during childhood. Kochanska (2001) found that in laboratory situations designed to induce anger in young children, children with disorganized attachment relationships, but not those with organized attachment classifications, showed significant longitudinal increases in levels of expressed anger. By 3
months of age, their anger levels were significantly higher than those expressed by secure or resistant infants. Disorganized attachment, particularly in high-risk samples, may also put children at risk for clinical levels of anger and aggression during childhood (Lyons-Ruth, 1996; Lyons-Ruth, Easterbrooks, & Cibelli, 1997). Such findings are addressed in the later section on psychopathology.

Empathy has also been assessed empirically in relation to attachment. In the Minnesota studies, empathic behavior was assessed in two ways. First, ratings were composited from preschool teacher Q-sort descriptions on items pertaining to empathy (e.g., "shows concern for others," "is empathic"). The ratings significantly distinguished those with secure and insecure histories, often at the item level (see also Waters et al., 1979). In the written descriptions teachers provided of individual children, those described as "empathic" in each case had secure histories, whereas those described as "mean" were always those with avoidant histories. Second, empathic behavior was assessed from videotapes of preschool interaction (Kessenbaum, Farber, & Stroufe, 1989; Stroufe, 1983). Tapes made of free play interactions were examined for instances in which a child in the frame was distressed, and children in the vicinity of the distressed child were rated for empathic responses. Results indicated that children with secure histories were more empathic than children with avoidant histories. Children with resistant histories did not differ significantly from either of the other attachment groups on these measures, although they did seem to have trouble maintaining a boundary between someone else's distress and their own; that is, they became distressed in response to witnessing distress in another. This is consistent with the idea that differences in attachment will be reflected in differences in emotion regulation.

Overall, attachment history does seem to contribute to the prediction of anxiety, anger, and empathy during childhood. Children with resistant attachment histories are more likely than children with other histories to have problems with anxiety, perhaps in response to the constant vigilance they have developed in their early attachment relationships. Children with avoidant or disorganized/disoriented histories are most likely to show angry, aggressive behavior both with parents and with peers, perhaps as a response either to chronic rejection and insensitivity from their caregivers, or to the unmanageable paradox of attachment to frightened or frightening caregivers. In contrast, children with secure histories seem to have acquired a foundation for empathy from their early relationships; they bring to new relationships the ability to be sensitive to another's emotional cues, as well as a pattern of dyadic affect regulation in which the one who is not distressed helps to regulate the other.

**Social Competence**

Navigating the world of social relationships is an important task of development. Because humans are inherently social beings, social competence is an essential lifelong component of competence in school, work, and personal/family life, as well as of overall adjustment. There are two avenues through which infant-caregiver attachment relationships prepare individuals for this task: expectations about the social world, and the ability to coordinate behavior in social interactions.

One way attachment relationships contribute to social competence is by providing a foundation for a child's expectations about and approach to other relationships (Stroufe & Fleson, 1986, 1988). Secure infants, as they develop, bring forward with them experience-based expectations that social partners will be responsive to them and that they are worthy of such positive responses. Insecure infants, as they develop, bring forward experience-based expectations that they will be treated inconsistently or rejected outright by social partners, and that they are not worthy of better treatment (Bowlby, 1969/1982). Such expectations could affect the ways in which children approach relationships, as well as the ways in which they respond to socially ambiguous cues from relational partners. Another way in which attachment relationships contribute to social competence is through teaching infants about behavioral reciprocity, synchrony, and communication (Ainsworth & Bell, 1974; Stroufe, Egeland, & Carlson, 1999).

The data on social competence illustrate particularly well the coherence between individual differences in early attachment and later social functioning, despite changes in settings and relational partners. Research both from the Minnesota studies and from other laboratories has revealed differences in orientation toward peers as early as the toddler period (Belsky & Fearon, 2002; Pastor, 1981). As children expand their social worlds, they must begin to function with some proficiency in a group, and must also engage in more extensive reciprocity with particular partners. When teacher
ratings were focused on such capacities, children with secure histories were found to be dramatically more competent (Sroufe, 1983). In observational research, secure children also demonstrate more subtle skill in coordinating behavior with a play partner; Positive bids by children with secure histories are more often accepted and reciprocated by peers, whereas the less synchronous bids of children with insecure histories are more often rebuffed by playmates (Fagot, 1997; Jacobson & Wille, 1986).

By middle childhood children not only must interact with others, but must forge loyal and enduring friendships, find a place in the more organized peer group, and coordinate friendships with group functioning. In the Minnesota Parent–Child Project, global ratings by school teachers confirmed the greater interpersonal competence of those with secure histories (Sroufe et al., 1999). In other research in the school setting, children with secure histories were rated by teachers as more popular and taking more social initiative, and were rated by observers as engaging in more prosocial behavior than their insecure counterparts (Bohlin, Hagell, & Rydell, 2000). More detailed analysis of 47 children in the Parent–Child Project summer camp revealed differences with regard to each of the age-related competence issues. Those with secure histories, compared to those with insecure histories, more often formed friendships at a summer camp (and more often with those who also had been secure), as revealed by reciprocated sociometric choices, counselor nominations, and direct observations of frequency of interaction (Elicker et al., 1992). Those with secure histories were also more accepted by the group and adhered more to group norms, such as those regarding maintenance of gender boundaries, than those with insecure histories (Sroufe, Bennett, Englund, Urban, & Shulman, 1993). Finally, those with secure histories were better able than those with insecure histories to manage complex social situations, as witnessed by the ease of incorporating others into their activities while still maintaining a reciprocated focus with their partners (Shulman, Elicker, & Sroufe, 1994).

In adolescence, at a camp reunion for the Parent–Child Project camp subsample, teens with secure histories were effective in the ways they had been at camp; they were also rated by camp counselors as more competent in general, and more effective in the mixed-gender crowd in particular (Sroufe, Bennett, et al., 1993; Weinfield, Ogawa, & Sroufe, 1997). In addition, ratings in group problem-solving situations revealed greater leadership abilities for those with secure histories, who were also significantly more often elected spokespersons for their groups (Englund, Levy, Hyson, & Sroufe, 2000). In an interview study of the full sample at age 16, the friendships of girls with secure histories were judged to be more intimate than those of girls with insecure histories (Ostroja, 1996). Also, again at age 16 years, competence rankings by high school teachers using the full sample favored those with secure histories (Sroufe et al., 1999).

In the Parent–Child Project, children’s social competence was correlated over time. Attachment history, along with earlier social competence, did predict later social competence better than attachment alone, as developmental theory derived from Bowlby would predict. But it was also the case that attachment history accounted for additional variance in the later outcomes, even after earlier social competence was taken into account (Sroufe et al., 1999). Overall, the empirical data on social competence and attachment are strongly supportive of Bowlby’s theory. (See Berlin, Cassidy, & Apple, Chapter 15, this volume, for additional discussion of the links between infant attachment and later relationships with friends and peers.)

INFANT ATTACHMENT AND PSYCHOPATHOLOGY

In the conceptualization presented here, adapted from Bowlby, individual differences in infant attachment quality are not viewed as inherently pathological or nonpathological. In the pathways perspective, the hypothesis is that patterns of insecure attachment represent initiations of pathways that, if pursued, will increase the likelihood of pathological conditions. Thus, although insecure attachment is considered a risk factor for pathology, not all, or even most, insecurely attached infants will develop psychopathology. Psychopathology is a developmental construction involving a myriad of influences interacting over time (Sroufe, 1997). Similarly, secure attachment is not a guarantee of mental health, but rather is viewed as a protective factor or buffer. Research has demonstrated that children with secure histories are more resistant to stress (Pianta, Egeland, & Sroufe, 1990) and more likely to rebound toward adequate functioning following a period of troubled behavior (Sroufe, Egeland, & Kreutzer, 1990). Thus resilience too
is viewed as a developmental construction within this framework. Children who are resilient in the face of stress, or who recover following struggle, have been found to have had either early supportive care or increased support during the time of recovery; resilience is a process rather than a trait (Egeland, Carlson, & Sroufe, 1993; Sroufe et al., 2005a). Secure attachment appears to be part of this process. There is minimal evidence that some children simply are innately resilient (Sroufe, 1997).

There are numerous reasons why insecure attachment histories put children at risk for psychopathology. The anxiety and low frustration tolerance of individuals with resistant histories may make them vulnerable to anxiety disorders. The alienation, lack of empathy, and hostile anger of those with avoidant histories may make them vulnerable to conduct problems and certain personality disorders. Both may be vulnerable to depression, but for different reasons: passivity and helplessness on the one hand, alienation on the other. Both struggle with social relationships, which can exacerbate developmental problems through mistreatment by others or through association with deviant peer groups, and can limit social support, thus reducing an important buffer for stress. Those with histories of disorganized attachment, characterized by a failure to maintain a coherent attachment strategy and postures resembling trance-like states (Main & Hesse, 1990), are at risk for diverse forms of pathology, particularly dissociation (Liotti, 1992; Main & Morgan, 1995) and externalizing problems (Lyons-Ruth, 1996). (See also Lyons-Ruth & Jacobowitz, Chapter 28, and Dozier, Stovall-McClough, & Albus, Chapter 30, this volume, for further discussion of disorganized attachment and psychopathology.)

Data from the Minnesota Parent–Child Project provide some evidence for this high-risk sample. From individual interviews with the Schedule for Affective Disorders and Schizophrenia for Adolescents (administered at age 17), an overall index of psychopathology was created based on the number and severity of disorders manifested. The combination of avoidant and disorganized attachment histories across 12- to 18-month assessments accounted for more than 16% of the variance in this outcome. It was also the case, consistent with the developmental construction view, that later assessments (including other aspects of parenting) added to the predictability of pathology, ultimately accounting for more than 30% of the variance. Attachment history remained significant after other variables were accounted for, and early measures based on competing hypotheses (e.g., infant temperament) did not predict pathology significantly (Carlson, 1998).

As predicted by theory, a history of resistant attachment was related specifically and uniquely to anxiety disorders (Warren, Huston, Egeland, & Sroufe, 1997). Resistant attachment history did not predict externalizing disorders, and other forms of insecure attachment did not predict anxiety disorders. Some markers of infant neurological status (e.g., "slow to habituate" on the Brazelton Neonatal Behavioral Assessment Scale) also predicted anxiety disorders, although not as powerfully as resistant attachment, and resistant attachment remained significant after predictions from the Brazelton measure were taken into account.

Predicting anxiety-related symptoms was one focus of an independent study by Lewis, Feiring, McGuffog, and Jaskir (1984). In a longitudinal study extending from infancy to age 6, they examined the connection between infants' attachment history and later maternal reports of the children's psychopathological symptoms. They found that boys with resistant histories were more likely than boys with secure histories to have somatic complaints at age 6, and that boys with insecure histories (both avoidant and resistant) were more likely than boys with secure histories to be socially withdrawn.

Conduct problems have also been predicted by attachment history, both from avoidant attachment and from disorganized attachment. Renken and colleagues (1989) examined conduct problems in elementary school for children in the Parent-Child Project. Problem behaviors were assessed through ratings on the Child Behavior Checklist (Achenbach, 1978) by the children's teachers in first through third grades. Results indicated that boys with avoidant histories were rated as more aggressive by teachers than boys with secure or resistant histories were. By adolescence, a history of avoidant attachment in this same sample predicted a pattern of conduct problems that began in childhood and persisted at clinical levels at age 16 (Aguilar, Sroufe, Egeland, & Carlson, 2000).

In research from an independent laboratory, Lyons-Ruth and colleagues (1997) focused on the relation between disorganized attachment in infancy and severe externalizing behavior problems at age 7. They found that disorganized attachment...
significantly predicted externalizing problems, particularly when combined with mild deficits in cognitive functioning. Avoidant attachment, although not predictive of externalizing problems in their sample, was predictive of non-clinical-level internalizing symptoms.

Finally, disorganized attachment has significantly predicted dissociative symptoms. In the Parent–Child Project, disorganized attachment in infancy predicted adolescent dissociative symptoms based on the Child Behavior Checklist at age 16 and the Putnam Dissociative Experiences Scale at age 19. Dissociation was, of course, also predicted by a history of maltreatment and trauma (Carlson, 1998; Ogawa, Streuf, Weinfield, Carlson, & Egeland, 1997), but the relation between disorganized attachment and dissociation remained after childhood trauma was partialed out (Ogawa, Egeland, & Carlson, 1998). Of particular interest is that disorganization in infancy predicted clinical levels of dissociation in each assessment from middle childhood to late adolescence, with the strength of the prediction increasing over time (Ogawa et al., 1997). The finding that infant disorganization predicts dissociative symptoms at age 19 was recently replicated in another sample characterized by high social risk (Dutra & Lyons-Ruth, 2005; Lyons-Ruth, Dutra, Schuder, & Bianchi, 2006), strengthening the proposition that disruptions in early attachment relationships, and caregiving interactions that underlie disorganized attachment, put children at risk for dissociative pathology years later.

CATEGORICAL VERSUS CONTINUOUS CONCEPTUALIZATIONS OF INDIVIDUAL DIFFERENCES IN ATTACHMENT

Although the Attachment Q-Sort, which yields a continuous score, has been in use for over 20 years, the majority of infant attachment research still uses the Strange Situation and thus its classifications of secure, avoidant, resistant, and disorganized attachment. This taxonomic approach was chosen by Ainsworth and colleagues to capture the patterned nature of Strange Situation behavior—multifaceted behavioral configurations that unfold as the stress of the situation increases (Ainsworth et al., 1978). As the validity of the Attachment Q-Sort demonstrates, however, the taxonomy is not the only way to describe individual differences in attachment. Nonetheless, it is one that has proven extremely fruitful in theory and research. Recently Fraley and Spieker (2003) employed complex taxonomic analyses to test whether there is evidence that the attachment classifications represent naturally occurring types (e.g., naturally differentiated groups that are fundamentally divergent), rather than empirically and conceptually constructed groups based on underlying dimensions of behaviors. Their analysis did not yield evidence for naturally occurring types, suggesting that individual differences in attachment might also be described continuously—through multivariate combination of behaviors displayed during the Strange Situation, such as avoiding contact, resisting contact seeking proximity to the caregiver, and maintaining contact with the caregiver. Of course, no empirical issue is ever settled by one study, and the study provided a somewhat imperfect test of the extremely complex issue (Streuf, 2003; Wat & Bouchaine, 2003); the results are provocative nonetheless.

As attachment researchers become increasingly adept with sophisticated multivariate statistics, such techniques might help uncover complexities in individual differences. Expansion of our exploration of individual differences, however, do not negate or even lessen the importance of the research done with the existing classifications. The taxonomy resulted in the recognition that some infants who did not fit the classifications were unified in the disorganization of the strategies (Cassidy, 2003); facilitated the search for individual differences in attachment across the lifespan (Cassidy, 2003); and made possible a plethora of research that has elucidated the differences between avoidant and resistant organizations (Streuf, 2003). If advances in multivariate statistics result in new ways of conceptualizing individual differences, these methods are likely supplement rather than supplant the utility of the Strange Situation classifications, much in the spirit that the Attachment Q-Sort has done.

A DEVELOPMENTAL PERSPECTIVE ON INDIVIDUAL DIFFERENCES IN ATTACHMENT

Bowlby proposed a very particular view of individual differences over time, based on an adaptowaddington's (1957) "developmental path" (analogous to branching tracks in a train yard) early attachment do not directly cause later differences functioning; rather, they initiate pathways that probabilistically related to certain later out
Because any outcome is always the joint product of earlier history and current circumstances, changes in patterns of adaptation always remain possible. Prior adaptation, however, constrains subsequent development: Following a particular developmental trajectory limits the degree and nature of change, both in the sense that the longer a pathway has been followed the more difficult it is to achieve substantial change in direction, and in the sense that not all patterns of subsequent adaptation are equally likely. This results in change that is lawful rather than unpredictable.

Stability of the surrounding environment is certainly a partial explanation for the stability of individual differences. There is, however, a transaction between individual history and environment. One reason why change away from maladaptive behavioral patterns is difficult is that the environment itself is influenced by the individual; it does not simply wash over the person as an independent force. Individuals interpret, select, and influence the people and circumstances surrounding them to confirm existing beliefs and adaptational pathways (Scarr & McCartney, 1983; Storm, 1983; Stroufe, Egeland, & Kreutzer, 1990). Patterns of maladaptation are maladaptive in part because they lead to environmental experiences that perpetuate them. Take, for example, the case of avoidant attachment. If such children encounter responsive peers and teachers, counteracting the rejection they have experienced previously, in time one would expect changes in their working models of self and relationships. Such environmental inputs become less likely, however, because children with these histories are more likely to isolate themselves (Stroufe, 1983), to interpret the ambiguous or even supportive efforts of others as hostile (Suess et al., 1992), and to be rejected by both peers (Fagot, 1997) and teachers. In the Minnesota Parent–Child Project, the children with avoidant histories were the only children in the nursery school who made teachers angry, perhaps because of their cool defiance or aggression toward vulnerable children (Stroufe & Fleeson, 1988; Troy & Stroufe, 1987). It is because children have a role in creating their own later experiences that describing individual history and stability of the environment as completely separate influences is unduly simplistic.

The patterns of adaptation reflected in early attachment are, of course, subject to change. The pathways model implies two things about change: (1) The earlier a change in circumstances is seen (the shorter the time a pathway has been pursued), the more readily change may be accomplished; and (2) the more sustained the forces of change, the more permanent the change will be. Attachment classification itself has been shown to change between the ages of 12 and 18 months with changes in caregiver life stress (Egeland & Farber, 1984; Vaughn, Egeland, & Waters, 1979). Beyond infancy, the later functioning of children who were securely (or insecurely) attached as infants is sometimes worse (or better) than would have been predicted from attachment alone. Such change is lawful, with the most potent factors identified thus far being changes in caregiver life stress, social support, and depression (Erickson, Stroufe, & Egeland, 1985; Pianta et al., 1990). Longitudinally assessed changes in attachment security between the Strange Situation in infancy and attachment state of mind on the Adult Attachment Interview in adolescence and adulthood have been lawfully predicted by divorce, life stress, family functioning, and features of the home environment during the interim years (Hamilton, 2000; Sampson, 2004; Waters, Merrick, Treboux, Crowell, & Albersheim, 2000; Weinfield, Stroufe, & Egeland, 2000; Weinfield, Whaley, & Egeland, 2004).

Current patterns of care and other environmental circumstances are clearly related to current adaptation, but this does not erase the influence of prior history. Early attachment history has been shown to add to the prediction of functioning even after the influence of contemporary experiences has been taken into account. For example, in the Parent–Child Project, peer competence and psychopathology measures obtained in adolescence were predicted by assessments of family functioning at age 13 years. Nonetheless, early history of care and attachment still added predictive power (Englund et al., 2000). Even in the face of changes in adaptation, therefore, early experience still informs later behavior (Stroufe et al., 1990).

**ON FINDING AND NOT FINDING PREDICTIONS FROM ATTACHMENT**

Researchers do not always find the degree of predictability with regard to individual differences in attachment that we have reported here, both from the Minnesota studies and from other research. Indeed, the Minnesota Parent–Child Project findings with regard to attachment are often modest as well. There is some inconsistency in the literature (see Thompson, Chapter 16, this volume), with some findings being small or nonsignificant, and
others being quite powerful. There are many possible reasons for these varied results.

Measurement Challenges

One issue that warrants consideration is measurement. Constructs such as secure and insecure attachment and subsequent socioemotional outcomes are extraordinarily difficult to assess. In studying such issues, investigators face not only the complexity of the constructs themselves, but also their changing manifestations across development.

Adequacy of measurement is a basic requirement for research of any type. With regard to early attachment, the only laboratory measure that is thoroughly validated against secure-base behavior at home is Ainsworth’s Strange Situation coding scheme, as used for infants between 12 and 18 months old. Beyond 20 months of age, the original observational paradigm and coding scheme need to be modified or changed entirely to account for developmental changes in the child and relationship (Ainsworth et al., 1978; Marvin, 1997). Other laboratory procedures for assessing early attachment, though perhaps promising, have yet to be as thoroughly validated against home behavior (see Solomon & George, Chapter 18, this volume). Research using unvalidated measures to assess attachment relationships may be introducing as-yet-unidentified measurement error into analyses.

Single assessments of constructs can also introduce unanticipated measurement error into analyses. Multiple assessments of constructs, particularly when gleaned from multiple reporters, can capture more of the true variance associated with the construct than a single measurement, even when that single measurement is sufficiently valid and reliable.

In the Parent–Child Project, multiple measurements were administered at different times, using multiple reporters. Attachment security was assessed twice, at 12 and 18 months, and these assessments were often pooled for a more robust indicator of attachment. We also pooled outcome assessments to establish more robust variables. Although individual differences in attachment did relate to teacher appraisals of social competence and behavior problems, relations based on the report of one teacher for each participant were significant but very small. Combining the reports of multiple teachers across years increased effect sizes. Pooling the reports of four independent counselors in the project summer camps served a similar purpose, yielding dramatically more impressive findings.

Counterintuitive research findings lead to natural questions about the psychometric properties of the measures used. Sound measurement strategies can help reduce psychometric problems, permitting confident exploration of counterintuitive results. A useful example comes from the work of the Grossmanns. They found an unusually high rate of avoidant attachment in the Strange Situation assessments of their Bielefeldt sample (Grossmann et al., 1985). Avoidant attachment in this sample, however, was related to caregiver sensitivity at 6 months and to other external correlates of avoidant attachment that had been established in previous samples, thus reducing the likelihood that the results could be attributed to measurement error. Further assessments showed this high rate of avoidant attachment to be a cohort effect, reflecting difficult societal circumstances at the time that may have influenced caregiving environments. The high rate of avoidant attachment in fact represented a coherent and informative consequence of a characteristic of the sample. Such research holds an important place in the study of attachment, because it allows us to understand more about the processes that influence individual differences.

Specificity of the Role of Attachment in Development

Beyond these measurement concerns, conceptual problems are often at issue. Not only are many aspects of early care outside of the attachment domain (e.g., the socialization of impulse control; Sroufe, 1997), but variations in quality of care, even broadly conceived, are not responsible for all aspects of development and behavior. For example, one early inconsistency in the literature concerned the relation between attachment security and the age of mirror self-recognition (Cicchetti, 1986; Lewis, Brooks-Gunn, & Jaskir, 1985; Sroufe, 1988). Such inconsistencies do not diminish the value of Bowlby and Ainsworth’s elaboration of attachment theory, however, because nothing in the theory would lead to a strong prediction regarding a variable that is so heavily influenced by cognitive maturation. To the extent that such relations are found in research, they are most likely to be indirect, and are not validations of attachment theory per se. In the Parent–Child Project, there was an impressive link between infant attachment and academic achievement at age 16 years (Teo, Carlson
in the samples is at the heart of the difference in findings. In both samples, negative attachment-related life experiences were associated with instability of attachment classifications. The middle-class sample allows us to see that attachment can be stable over a long period of time; the higher rate of discontinuity (and the higher rate of negative life events) in the Parent–Child Project, however, allows for a more in-depth examination of types of experiences related to stability and change. Both middle-class samples and samples that are more at risk for developmental difficulties are needed in continuing research. Only through research that spans geographic, socioeconomic, family structure, and cultural boundaries will we gain a full understanding of the complexities of attachment’s role in development.

CONCLUSION

In general, the meaning of individual differences in attachment security, as conceptualized by Bowlby and Ainsworth, has been well substantiated by research. At times, of course, well-conceptualized, rigorous studies have failed to obtain predictive relations. Development is extraordinarily complex, and longitudinal research is very difficult to carry out. Despite these challenges, research has repeatedly confirmed core propositions of this individual-differences theory.

In this chapter, we have described Bowlby and Ainsworth’s theory of attachment security with regard to the normative function of attachment relationships, antecedents and qualities of individual differences in attachment, and consequences of individual differences in attachment for social and personality development and for psychopathology. Bowlby focused on attachment because of its evolutionary value in the survival of the human infant, and because of its central role in subsequent human adaptation and development. The normative stages of attachment formation he proposed (see Marvin & Britner, Chapter 12, this volume) inspired Ainsworth’s assessment procedure. The similarity of resistance and avoidance to the patterns of protest, anger, and detachment that are normal responses in the face of loss of a caregiver led Ainsworth to focus on these behaviors in ongoing infant–caregiver relationships. The advent of the Strange Situation procedure has generated 30 years of research on the meaning and consequences of individual differences in infant attachment for development, and has been the starting point for the emergent study of attachment processes after infancy.

Bowlby’s theories about the implications of individual differences in attachment for personality development remain not only testable but also critically important to our understanding of the role of early experience in socioemotional development. These ideas have guided substantial infant research, and (as the contents of this volume demonstrate) will no doubt continue to contribute to our understanding of attachment as Bowlby (1969/1982) conceptualized it, “from the cradle to the grave” (p. 208).

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