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25 / Attachment Theory

Jude Cassidy

Attachment theory can be viewed as a comprehensive theory of personality development that provides a perspective on human development and functioning dramatically different from other theories. In fact, it was Bowlby's perceptions that existing theories did not adequately explain observed phenomena that led him to begin devising a new theory (Bowlby, 1958, 1960a, 1960b). The focus, for instance, of psychoanalytic theory on an individual's inner fantasies rather than on an indi-

vidual's actual experiences was inconsistent with Bowlby's biological training, which had led him to seek to understand the interaction of organism and environment. In addition, the secondary-drive mechanisms proposed by both psychoanalytic and social-learning theorists to explain the child's relationship with the mother as derivative of her feeding the infant did not mesh with observations by Lorenz (1935) that infant geese become attached to parents who do not feed them, or with later observations by Harlow (1962) that infant rhesus monkeys, in times of stress, preferred not the wire-mesh "mother" that fed them but rather the cloth-covered "mother" that provided them contact comfort.

Dissatisfied with a variety of features of traditional theories, Bowlby sought new understanding by exposing himself to ideas and colleagues from fields such as evolutionary biology, ethology, cognitive science, and control systems theory (Bowlby, 1982). Bowlby drew upon all of these areas to formulate the innovative proposition that the infant's tie to the mother emerged as a result of evolutionary pressures. For Bowlby, this strikingly strong tie, so clearly evident particularly when disrupted, results not from an associational (secondary-drive) learning process but rather from a biologically based desire for proximity that arose through the process of natural selection.

Within contemporary developmental psychology, attachment theory is the theoretical framework within which social development is most widely examined. This is due in large part to the development of a standardized procedure for assessing individual differences in infant attachment quality, Ainsworth's Strange Situation procedure and her pioneering empirical work (e.g., Ainsworth, Blehar, Waters, & Wall, 1978). Hundreds of studies, conducted primarily in the United States but also in England, Germany, Israel, Japan, and the Netherlands, form a convergent body of research providing support for major principles of attachment theory. Recent development of systems for assessing attachment quality during childhood, adolescence, and adulthood have extended this empirical base (Cassidy & Marvin, 1992; George, Kaplan, & Main, 1985; Kobak, Cole, Ferenz-Gillies, Fleming, & Gamble 1993; Main & Cassidy, 1988; Waters & Deane, 1985). Review of this extensive literature is outside the scope of this chapter, which focuses instead on theory. For reviews, see Belsky and Cassidy (1994), Bretherton (1985), and Lamb, Thompson, Gardner, and Charnov (1985).

The first section of this chapter contains a description of Bowlby's propositions related to the nature of the child's tie to the mother. The biological bases of attachment are discussed, and the developmental course of attachment in infancy and childhood is also described. In the second section, theory related to individual differences in attachment security is reviewed. Bowlby's notion of internal working models, central to understanding individual differences in security, is described, followed by theoretical discussion of what is thought to lead to secure versus insecure attachment. The final section contains a brief examination of clinical applications of attachment theory.

The Nature of the Child's Tie to the Mother

BIOLOGICAL BASES OF ATTACHMENT

The most fundamental aspect of attachment theory is its focus on the biological bases of attachment behavior (Bowlby, 1969/1982, 1973, 1980). Attachment behavior is any behavior that has the predictable outcome of increasing proximity of the child to the attachment figure (usually the mother). Some attachment behaviors (smiling, vocalizing) are signaling behaviors that signal the mother of the child's interest in social interaction and thus serve to bring her to the child for such interaction. Some (crying) are aversive and bring the mother to the child to terminate them. Some (approaching, following) are active behaviors that move the child to the mother. Bowlby proposed that during the time in which humans were evolving, the time he called "the environment of evolutionary adaptedness," genetic selection favored attachment behaviors because they increased the likelihood of child-mother proximity.

Many predictable outcomes beneficial to the child are thought to result from the child's proximity to the parent (Bowlby, 1969/1982). These include feeding, learning about the environment,

and social interaction. All of these are important. But the predictable outcome of proximity thought to give survival advantage to the child is protection from preditors. Infants who, in the environment of evolutionary adaptedness, were biologically predisposed to stay close to their mothers were less likely to be killed by predators. This is referred to as the "biological function" of attachment behavior. This is the most basic of predictable outcomes: Without protection from predators, feeding is not necessary, and learning cannot take place. Because of this biological function of protection, infants are thought to be biologically predisposed particularly to seek the parent in times of distress.

Attachment behaviors are thought to be organized into an attachment behavioral system in which the specific attachment behaviors may be less important than the internal organization of these behaviors. Bowlby (1969/1982) borrowed the concept of the behavioral system from the ethologists to describe a species-specific system of behaviors that leads to certain predictable outcomes, at least one of which offers clear survival advantage to the individual. The concept of the behavioral system involves inherent motivation. There is no need to view attachment as the by-product of any more fundamental process or "drive." This idea is supported by evidence indicating that in contrast to secondary drive theories (Freud, 1910/1957a), attachment is not a result of associations with feeding (Ainsworth, 1967; Harlow, 1962, Schaffer & Emerson, 1964). Bowlby's notion of the inherent motivation of the attachment system is compatable with Piaget's (1954) formulation of the inherent motivation of the child's interest in exploration.

Bowlby (1969/1982) adopted a control system approach to attachment behavior. Drawing on observations of ethologists who described instinctive behavior in animals as serving to maintain them in a certain relation with the environment for long periods of time, Bowlby proposed that a control systems approach also could be applied to attachment behavior. He described the workings of a thermostat as an example of a control system. When the room gets too cold, the thermostat activates the heater; when the desired temperature is reached, the thermostat turns off the heater. Bowlby described children as wanting to maintain a certain proximity to the mother. When a separation becomes too great in distance or time, the attachment system becomes activated, and when sufficient proximity has been achieved, it is terminated. Bowlby (1969/1982; see also Bretherton, 1980) later described the attachment system as working slightly differently from a thermostat: as being continually activated (with variations of relatively more or less activation) rather than ever being completely terminated.

The child's desired degree of proximity to the parent is thought to vary at different times and in different settings, and Bowlby (1969/1982) was interested in understanding how this variation leads to relative increases and decreases in activation of the attachment system. He described three classes of causal factors: condition of the child (whether the child is sick, tired, or in pain), condition of the environment (whether it contains threatening stimuli), and the location and behavior of the mother (whether she is absent, moving away, or rejecting). Interaction among the classes of causal factors can be quite complex; sometimes only one needs to be present, and at other times several are necessary. In relation to relative deactivation of attachment behavior, Bowlby was clear that his approach has nothing in common with a model in which a behavior stops when its energy supply is depleted. For Bowlby, attachment behavior stops in the presence of a terminating stimulus. The nature of the stimulus that serves to terminate attachment behavior differs according to the degree of activation of the attachment system. If the attachment system is intensely activated, contact with the parent may be necessary to terminate it. If it is moderately activated, the presence or soothing voice of the parent or even of a familiar substitute caregiver may be sufficient.

The attachment behavioral system can be fully understood only in terms of its complex interplay with other biologically based behavioral systems. Bowlby highlighted several in relation to young children, and two, the fear and exploratory systems, will be discussed here. For Bowlby, the biological function of the fear system, like that of the attachment system, is protection. It is biologically adaptive for children to be frightened of certain stimuli. Bowlby (1973) described "natural clues to danger," stimuli that are not *inherently* dangerous but that increase the likelihood of danger. These

include darkness, loud noises, aloneness, and sudden, looming movements. Because the attachment and fear systems are intertwined so that a frightened infant increases attachment behavior, infants who find these stimuli frightening are thought to be more likely to seek protection and thus survive to pass on their genes. The presence (or absence) of the attachment figure is thought to play an important role in the activation of the infant's fear system such that an available and accessible attachment figure makes the infant much less susceptible to fear.

The exploratory behavioral system is also one that is thought to be closely linked to the attachment behavioral system. The complementary yet mutually inhibiting nature of the two systems is thought to have evolved to ensure that while the child is protected by maintaining proximity to attachment figures, he or she nonetheless gradually learns about the environment through exploration. The link between these two systems is best captured within the framework of an infant's use of an attachment figure as a "secure base from which to explore," a concept first described by Ainsworth (1963) and central to attachment theory (Ainsworth et al., 1978; Bowlby, 1969/1982, 1988).

Noting the complementary activation and inhibition of these two behavioral systems, Ainsworth (Ainsworth, Bell, & Stayton, 1971) referred to an "attachment-exploration balance." Most infants balance these two behavioral systems, responding flexibly to a specific situation after assessing both the environment's characteristics and the caregiver's availability. For instance, when the attachment system is activated (perhaps by separation from the attachment figure, illness, fatigue, or by unfamiliar people and environments), infant exploration and play decline. Conversely, when the attachment system is not activated (e.g., when a healthy, well-rested infant is in a comfortable setting with an attachment figure nearby), exploration is enhanced. In terms of fostering exploration, Bowlby described as important not only the physical presence of an attachment figure but also the infant's beliefs that the attachment figure will be available if needed. A converging body of empirical work, in which maternal physical or psychological presence was experimentally manipulated, in fact has revealed support for the theoretically predicted associations between maternal availability and infant exploration (Ainsworth & Wittig, 1969; Carr, Dabbs, & Carr, 1975; Rheingold, 1969; Sorce & Emde, 1981).

It is important to clarify the distinctions among attachment behavior, the attachment behavior system, and an attachment bond (Ainsworth, 1973; Bowlby, 1982; Hinde, 1982). Attachment behavior is behavior that promotes proximity to the attachment figure. The attachment behavioral system is the organization of a variety of attachment behaviors within the individual. An attachment bond refers to a tie not between two people but rather a tie that one individual has to another individual who is perceived as stronger and wiser (e.g., the bond of an infant to the mother). Attachment behavior may or may not be present; it is situational. The attachment bond is considered to exist consistently over time, whether attachment behavior is present or not. Furthermore, the presence of attachment behavior does not necessarily indicate the existence of an attachment bond. The same behavior can serve more than one behavioral system and can have different meanings in different contexts or when directed to different people. For example, just because a baby approaches someone does not mean he or she is attached to that individual; even though approach can be an attachment behavior, it also can be an exploratory behavior.

PHASES IN THE DEVELOPMENT OF ATTACHMENT DURING INFANCY AND CHILDHOOD

Bowlby (1969/1982; see also Ainsworth, 1967) described four phases in the development of attachment during infancy and early childhood. Because development is complex and there is much individual variation in human infants, the timing of this development varies among individual infants. The four phases are as follows.

Phase 1: Undiscriminating Social Responsiveness (birth to 2 to 3 months): Several attachment behaviors are present at birth: rooting, sucking, crying, vocalizing, smiling, grasping, all of which have the predictable outcome of bringing

or keeping the mother near the infant. Newborns are well adapted to respond to stimuli most likely to emanate from people. For instance, they show early preferences for listening to the human voice over other sounds and for looking at patterned over plain colored images (Fantz, 1965, 1966; Hetzer & Tudor-Hart, 1927). However, during this phase, there is very little discrimination among people. The infant will respond to nearly any stimuli, not only to a particular person: He or she will stop crying when comforted by anyone and will smile to anyone.

Phase 2: Discriminating Social Responsiveness (approximately 2 to 7 months): During this period, the infant begins to distinguish mother and other familiar people from strangers, in some modalities earlier than others. Attachment behaviors are now activated and terminated in response to specific others. Preference as well as discrimination is shown.

Phase 3: Active Initiation in Seeking Proximity and Contact (approximately 7+ months): During this phase, the infant becomes more active because of the onset of locomotion. Signaling attachment behaviors are now increasingly replaced by active attachment behaviors such as approaching and following, and there is a more coordinated use of grabbing. It is during this phase that "goal-corrected" behavior sequences emerge. Infants now can alter their behavior, continually choosing from a repertoire of attachment behaviors depending on the mother's whereabouts and the state of the environment. This is the first phase in which infants truly can be described as "attached," and it coincides with the phase that psychoanalysts call "true object relations." Nonetheless, this phase is limited by what Piaget (1926) refers to as "egocentrism."

Phase 4: The Goal-Corrected Partnership (approximately 3 years+): In order to move into this phases, the child first must be able to see things from mother's point of view, a skill facilitated by the growth of language. The child now has the ability to take into consideration the mother's plans and wishes. This phases is referred to as a "partnership" because for the first time, the child is aware of both his or her own goals and those of the mother, and can use this knowledge to negotiate a joint plan with her.

Individual Differences in Attachment

Within the context of considerable emphasis on the biologial basis of attachment, Bowlby also acknowledged the important role of learning. This was most evident in thinking related to individual differences. Despite the fact that all children, given sufficient contact with a caregiver, become attached, the *quality* of that attachment varies across relationships. In this section, I first describe Bowlby's concept of the internal working model. This notion is central to the issue of individual differences in attachment quality because it provides an explanation of the processes whereby early experience is linked with quality of attachment and later functioning. I then describe secure and insecure attachment.

INTERNAL WORKING MODELS

According to Bowlby, during the first year the child develops a set of expectancies, a set of mental representations that provide him or her with models of the workings, properties, characteristics, and behavior of attachment figures, the self, others, and the world. These working models (also called "representational models") are thought to be strongly influenced by the child's repeated daily experiences in relation to attachment, "in fact far more strongly determined by a child's actual experience throughout childhood than was formerly supposed" (1979, p. 117). (This emphasis on experience departs dramatically from Freud's focus on inner fantasies.) These models are similar to cognitive maps that permit successful navigation of an organism's environment. Unlike maps, however, working models are not static images but are flexible and adaptable representations. Bowlby relates working models to the ability to plan, and asserts that it is within the framework of these working models that the child can assess

the situation and plan behavior. Thus, these models are thought to be central influences on the organization of the child's attachment behavior. The notion of working models is similar to a variety of constructs within the developmental, social, clinical, and cognitive psychology literatures: for example, to constructs such as "schema" and "relational models." (See Baldwin, 1992, for a review.)

Besides affecting behavior, working models are thought to influence feelings, attention, memory, and cognition (Bowlby, 1969/1982; Main, Kaplan, & Cassidy, 1985). They are thought to become so deeply ingrained in the individual that the ways in which they influence feelings and behavior may become automatic. This situation carries with it both advantages and disadvantages. Working models can serve a useful purpose for the child, making unnecessary the construction of a new set of expectations for each situation. This automatic use of existing models to appraise and guide behavior in new situations increases efficiency. For example, a baby who has a working model of mother as available when needed may spend less time monitoring her movements than might otherwise be the case. When models become inaccurate or outdated, however, their automatic nature may be a disadvantage because it is difficult to update them if they are not conscious.

Attachment theory emphasizes the important influence of early experience on later development, and working models are thought to be central to explaining the nature of this influence. For instance, children whose early experiences have led them to develop a working model that their needs will be attended to may be likely to wait their turn patiently for a desired toy in the preschool. In this case, the working model that others are responsive may be part of the process through which early sensitive care predicts later social competence (Sroufe, 1983). Although Bowlby viewed working models as remaining open to new input to a certain extent, he believed that with development, working models, particularly those that are unconscious, become increasingly resistant to change.

The working model of the self differs from other working models only in that its object is the self. In other ways, it is similar to working models in general: It is an active construction that, because it guides behavior, perception, and feelings, can serve a useful purpose; yet its automatic and unconscious nature renders it resistant to change and thus potentially pathological when the model becomes outdated or inaccurate. For Bowlby (1973), there is an inextricable intertwining of the working model of the attachment figure and the working model of the self. Over time, children come to believe that their mother will behave in certain predictable ways. Based on these experiences, children simultaneously develop a complementary view of themselves. For example, if children are loved and valued, they develop a working model of the parent as accepting and responsive and a complementary model of themselves as lovable, valuable, and special. If, however, children are neglected or rejected, they come to feel worthless and of little value. Bowlby stated that this intertwining exists despite the fact that it may not be valid:

> An unwanted child is likely not only to feel unwanted by his parents but to believe that he is essentially unwantable, namely unwanted by anyone. Conversely, a much-loved child may grow up to be not only confident of his parent's affection but confident that everyone else will find him lovable too. Though logically indefensible, these crude overgeneralizations are none the less the rule. Once adapted, moreover, and woven into the fabric of working models, they are apt henceforward never to be seriously questioned. (1973, pp. 204–205)

It is important to note that even though the idea of internal working models emphasizes the behavior of the attachment figure, Bowlby (1979) acknowledges the contribution of infant characteristics. For Bowlby, as well as for other attachment researchers and theorists (e.g., Sroufe, 1985), quality of attachment represents the history of mother-child interactions and the extent to which these interactions give the baby confidence in the mother's accessibility and responsiveness. Sufficient maternal availability and responsiveness for a baby with one temperament may be insufficient for a baby with another. For Bowlby, it is the infant's confidence derived from the interplay of both maternal and infant contributions that influences attachment quality. Although Bowlby's attachment theory devotes considerable attention to the parent's contribution to the infant's working model, it does not delineate as explicitly the expected contribution of infant characteristics.

For further discussion of internal working models, see Bretherton (1985, 1990), Main et al. (1985), and Sroufe and Fleeson (1986).

INDIVIDUAL DIFFERENCES IN INTERNAL WORKING MODELS: QUALITY OF ATTACHMENT

From an ethological perspective, not only is the tendency to form attachments adaptive, but so is the ability to be flexible in the organization of the attachment system in response to environmental variation. Such tailoring of the infant's behavior to conform to environmental circumstances is described by Main and Solomon (1986) as a "strategy." The ultimate function of these strategies is thought to be protection in that they increase the likelihood of infant-parent proximity. Strategies are thought to be biologically based in that they are automatically employed and need not be in any way conscious for the individual (Main, 1990).

Secure Attachment: Most children are securely attached to their parents (Ainsworth et al., 1978; Campos, Barrett, Lamb, Goldsmith, & Stenberg, 1983). Secure attachment is thought to arise from experiences that provide the child with a working model of the parent as usually available, responsive, accepting. The parent serves the child as a secure base from which to explore, and the child develops a model of the parent as one on whom he or she can depend in times of trouble and of the self as one worthy of such care.

The strategy that secure children use to organize their attachment system is thought to be simple and direct: They use the parent as a secure base from which to explore (Ainsworth, 1984; Main & Solomon, 1986). These children are thought to have a fluid attachment-exploration balance (Ainsworth et al., 1971). They are thought to assess the condition of the environment, their own state, and the whereabouts and behavior of the mother, and then act accordingly. If the environment appears safe and is interesting and the mother is nearby, they explore. If danger appears or the mother's availability becomes threatened, they seek proximity to the mother (Main, 1990). This fluid balance reflects the belief of these children that their signals will be responded to.

Secure attachment is viewed not as incompatable with self-reliance but rather as leading to it: "an unthinking confidence in the unfailing accessibility and support of attachment figures is the bedrock on which stable and self-reliant personality is built" (Bowlby, 1973, p. 322). Both Bowlby and Ainsworth (1984) point out that contrary to some popular misconceptions of secure attachment as promoting clinging and excessive dependency, secure attachment and the certain knowledge that the parent will be available if needed is largely influential in giving the child the confidence for independent exploration. A premature attempt to push the child to independence by rebuffing attachment behavior can instead activate intense attachment behavior. The child then becomes even more concerned with the attachment figure and is therefore too preoccupied to move into independent exploration. The parental goal of promoting independence is not achieved.

Insecure Attachment: Insecure attachment is thought to result from a history of experiences with a caregiver who somehow has not provided the child with a secure base. There are many ways in which this can occur: consistent rejection, lack of availability, and extreme forms of pathological parenting (e.g., abuse, severe parental mental illness). Care of this sort is thought to lead to internal working models of others as unavailable and untrustworthy and complementary models of the self as unworthy of sensitive treatment. These experiences leave the insecure child in a more difficult position than the secure child. The secure child can count on the mother to be helpful and, therefore, has principally the environment and his or her own state to consider in relation to activation of the attachment system. The insecure child, however, has, in addition, to consider the probable way in which the mother will be unhelpful: The child must consider the environment, his or her own state, and how best to have needs met given the expected maternal behavior (Main, 1990).

The strategies that insecure children develop in response to their experiences are thought to involve manipulation of the balance between the attachment and exploratory systems such that either one or the other is emphasized. In response to a parent who is minimally or inconsistently responsive, the infant is thought to develop an under-

standable strategy of emphasizing attachment behavior and increasing bids for attention. Such an infant is viewed in this scheme as having a coherent strategy of exhibiting extreme dependence on the attachment figure. Main and Solomon state that "in its heightened display of emotionality and dependence upon the attachment figure, this infant successfully draws the attention of the parent" (1986, p. 112; see also Cassidy & Berlin, 1994). In response to a parent who is rejecting of an infant's attachment behavior, the infant is thought to develop a strategy of ignoring cues that might activate the attachment system and to defensively deemphasize the importance of the relation with the attachment figure (Bowlby, 1980; Main, 1981; see also Cassidy & Kobak, 1988). Correspondingly, the exploratory system may instead be emphasized. This strategy is thought to serve to permit the infant to remain in proximity to the caregiver without engaging in either angry or clingy behavior, either of which might result in further rebuff by a rejecting caregiver (Main, 1981).

Insecure attachment is thought to lead to impaired functioning in certain areas, but not all. As a result of their experiences and their internal working models, insecure children are expected to have trouble not only trusting and depending on others but also recognizing their own self-worth. These perceptions are thought to hinder the formation of supportive relationships and thus place insecure children at risk for socioemotional difficulties. However, some areas of functioning, such as work-related achievement, may be less affected.

Clinical Applications of Attachment Theory

As a clinician, Bowlby was concerned about understanding psychopathology, and such concern substantially guided his work on attachment theory. A central tenet of attachment theory is the belief that early attachment experiences have profound influences on later social and emotional functioning. Thus, many childhood and adolescent psychiatric disorders are viewed as having roots in early problematic attachment relationships. Several of these disorders are discussed briefly in this section. In considering these disorders, it is important to keep in mind a crucial distinction: Although certain psychopathologies may be rooted in insecure attachment, insecure attachment itself is not to be equated with psychopathology (Sroufe, 1988). (For a discussion of the central importance of attachment theory and research to the emerging field of developmental psychopathology, see Cicchetti, Cummings, Greenberg, & Marvin, 1990; Sroufe, 1986; and Sroufe & Rutter, 1984.)

ANXIETY DISORDERS

Bowlby's (1973) theory of fear, described earlier, is central to his explanations of anxiety disorders. This theory departs radically from that of both traditional psychoanalysts and social learning theorists. Unlike Freud (1926/1959), Bowlby proposed that fears other than those of known threats from external sources can be part of healthy development and are not to be considered neurotic. Unlike social learning theorists (e.g., Sears, 1963), he did not believe a painful experience with a person or object to be necessary before one can fear it. From an ethological perspective, Bowlby viewed certain fears as biologically adaptive. For Bowlby, these are fears of situations or events that, although not dangerous in themselves, bring with them an increased risk of danger. Those who fear these are more likely to survive to pass on their genes. As mentioned, these include fears of unfamiliar objects and people, the dark, being alone, heights, loud noises, and sudden (particularly looming) movements. Thus, fears of the dark or of being alone, for instance, are understood not as neurotic but as resulting from biological predispositions emerging from natural selection. These fears are thought to be adaptive throughout the life span.

When considering individual differences in the tendency to become anxious, Bowlby (1973) recognized that infant characteristics make important contributions. He discussed the role of gender, minimal brain damage, childhood autism, and physical handicap. Based on the animal litera-

ture, he also hypothesized the existence of a genetic component in humans. During the two decades that have elapsed since the publication of Bowlby's (1973) major writings on anxiety, considerable information about the role of genetics in anxiety has emerged. Several family and twin studies have indicated that all anxiety disorders classified in the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 1994) appear to have a substantial genetic component. (See Torgersen, 1988, for a review.) Thus, in the context of a probable genetic contribution to anxiety disorders, it is also evident that much room for environmental contribution remains: Most monozygotic twins are discordant for anxiety disorders (Torgersen, 1988). To understand the etiology of anxiety disorder, further exploration of the particular biochemical mechanisms that are inherited, of the nature of genetic and environmental interaction, and of the specific aspects of environmental experience that are influential is important. It is this last area of investigation on which Bowlby focused.

Bowlby (1973) described a variety of experiences that could lead a child to be uncertain of the availability of the attachment figure and, in turn, lead to chronic anxiety. According to Bowlby, because children have a biologically based and adaptive fear of being alone, threats of abandonment can be particularly frightening to them. Thus, parental threats of abandonment used as a means of controlling the child ("If you don't behave, I'll leave") or perhaps while exasperated ("You'll be the death of me") can lead to children's fears. Because children tend to take their parents' statements literally, such threats can be viewed as realistic experiential bases for fears of separation. Additional relevant experiences include hearing of frightening events happening to others or having experienced such events in the past. If the parent has recently been ill, or if someone close to the child has died, the child may have increased worries that something may happen to the parent.

Bowlby defined anxiety as uncertainty about the availability of the attachment figure if needed. According to clinical observations (Bowlby, 1973) and to empirical work (e.g., Ainsworth et al., 1978), most infants receive care that assures them that the caregiver will be available if needed: They have an accessible and responsive caregiver to whom they can return as a "safe haven" should trouble arise. It is when infants do not have this certain knowledge that they can become chronically anxious.

How is this anxiety about the availability of the attachment figure manifested? According to Bowlby (1973), childhood phobias and intense separation anxiety are common results. Bowlby suggested, for instance, that what is usually called "school phobia" may in fact be a form of separation anxiety. Bowlby pointed out that children who consistently refuse to attend school are only rarely truly frightened of school, but rather much more commonly are experiencing acute separation anxiety: fear of leaving home and the attachment figure. Some children who refuse to attend school are frightened that something terrible may happen to the parent while they are away at school, and so remain home to protect the parent. Unlike the traditional psychoanalytic position (e.g., Freud, 1909/1952), which states that such a child fears his or her own aggressive impulses toward the parent, Bowlby suggested that the child's actual experiences may have led him or her to realistically fear for the well-being of the parent. Bowlby (1973) described another form of school refusal that occurs when a parent unconsciously keeps the child at home to serve as a caregiver for herself. The parent may subtly suggest that the child is too fragile or incompetent for school, and pretend that the child is staying home because he or she is unfit for the larger world. This situation often is viewed as the parent being overindulgent, when in fact the parent is placing a burden on the child by asking him or her to serve as a caregiver. These parents often did not receive care that they needed from their own parents as children and now turn to their children for such care.

Although there is as yet no empirical research examining connections between early attachment relationships and childhood anxiety disorders, there is evidence that insecurity in infancy is associated with children's fearfulness. For example, in Ainsworth's original sample, one group of insecure infants was overrepresented among the babies who showed clear-cut fear during the early free-play portion of a laboratory visit (Ainsworth, 1992). In a Japanese sample, the behavior of 7-month-olds later identified as insecure was considered more fearful than was that of infants later

identified as secure (Miyake, Chen, & Campos, 1985). Inhibited exploration of the environment and shy/withdrawn behavior during peer play also have been associated with infant insecure attachment (Hazen & Durrett, 1982; Renken, Egeland, Marvinney, Mangelsdorf, & Sroufe, 1989). Finally, in a sample of British 3-year-olds, concurrent infant insecure attachment was found to be associated with a variety of forms of fearfulness in the laboratory (Stevenson-Hinde & Shouldice, 1991). (See Cassidy, 1995, for a fuller description of the connections between attachment and anxiety.)

DEPRESSION

According to Bowlby, whereas threat of loss arouses anxiety, "actual loss gives rise to sorrow" (1979, p. 130). Evidence of this connection emerged from the earliest systematic observations of children undergoing major separations from attachment figures (Robertson & Bowlby, 1952). The sequence of emotional states common to most young children was striking: Following an initial phase of protest, most children moved to a phase of despair. Once children had given up all hope of regaining the lost attachment figure, great sadness set in. This sadness is thought to be so great because of the biologically based fundamental importance of the attachment figure. Although painful, sadness is thought to be a healthy and adaptive response to loss. It permits a period of reorganization that can lead to improved adaptation to new circumstances which do not include the lost person (Bowlby, 1980).

In some cases, however, response to loss may move from sadness to depression. (Bowlby [1980] reviewed studies suggesting that children with psychiatric disorders have disproportionately experienced loss of an attachment figure.) And, according to Bowlby, early attachment experiences can influence an individual's response to loss. If the child has been made to feel incompetent and incapable of establishing satisfying relationships with others, then understandably the child fears that once the attachment figure is lost, he or she will be totally alone. If a child has been made to feel unworthy of love, he or she is likely to feel that once the attachment figure is gone, no one will come to love the child. The child's experience-based expectations about the helpfulness of others in his or her time of distress also can play an important role in whether the response to loss becomes pathological.

Even when there is no loss, early attachment experiences are thought to play a role in childhood depression, particularly those that lead a child to "despair of ever having a secure and loving relationship with anyone" (Bowlby, 1988, p. 50). Ainsworth (Ainsworth et al., 1978), having observed that the intense cries of some infants were ignored, proposed that such repeated experiences are likely to contribute to despair. As Ainsworth pointed out, these babies learned that their signals for care would not be responded to and that they were helpless in eliciting care. Ainsworth suggested that the inability of these mothers to respond to their infants may have resulted from their own depressed preoccupations. The idea that problematic parent-child relationships may play a role in later depression characterizes much psychoanalytic and object relations theorizing (Bibring, 1953; Freud, 1917/1957b; Klein, 1932; Mahler, 1966).

Bowlby's theoretical notions about depression are also similar to theoretical viewpoints that emphasize the role of cognitive processes. For instance, Bowlby (1973) like Beck (1972), believed that depression hinges in large part on disordered cognitive beliefs about oneself, one's situation, and one's relationships. According to Bowlby, however, attachment theory goes further than Beck's theory by proposing the early experiential antecedents of these cognitive beliefs. Bowlby's notions are also highly compatible with those of Seligman (1975), who also emphasized the contribution of experiences to feelings of depression. Seligman proposed that repeated experiences with failure lead to "learned helplessness" wherein an individual loses faith in his or her abilities. According to Bowlby (1980), in most forms of depressive disorder, "the principal issue about which a person feels helpless is his ability to make and to maintain affectional relationships" (p. 247). Furthermore, as Cummings and Cicchetti (1990) have suggested, the cognitive processes thought to emerge from insecure attachment (feelings of helplessness, low self-esteem; see, e.g., Cassidy, 1988, 1990) are those that have been identified as related to depression (Kuiper & MacDonald,

1982; Peterson & Seligman, 1984). These findings strengthen the case for a link between attachment and depression and may reveal one of the processes through which this link occurs. (See also Kobak, Sudler, & Gamble, 1992.)

Recently, Cummings and Cicchetti (1990) have emphasized the importance of considering the link between attachment and depression within a transactional framework (Sameroff & Chandler, 1975). Within this scheme, the fact that insecure attachment does not lead inevitably to depression is emphasized. A model is proposed that "places attachment in the context of a large array of biological and experiential factors that affect risk for depression" (Cummings & Cicchetti, 1990, p. 356; see also Cicchetti & Aber, 1986). A variety of factors, which can be either enduring or transient in nature, are viewed as serving to either increase or decrease the likelihood of depression. It is the interplay of all these individual, familial, social, and larger environmental factors that is important. Insecure attachment is thought to increase children's vulnerability to depression by leaving them with few coping skills with which to deal with stressors and by leaving them with a decreased ability to develop relationships that could serve as a protective social support network during times of stress.

ADDITIONAL CLINICAL PERSPECTIVES

Recently there has been an upsurge in both theoretical and empirical work related to clinical issues. (See, e.g., Belsky & Nezworski, 1988; Cicchetti & Greenberg, 1992; Osofsky, 1991.) One perspective that has received increased attention examines attachment within a family systems framework (Byng-Hall, 1990; Byng-Hall & Stevenson-Hinde, 1991; Marvin & Stewart, 1990). The ways in which the quality of one relationship (e.g., the marital relationship) influences the quality of other relationships (e.g., the child-parent attachment relationship) are considered. In addition, disordered family functioning is viewed as potentially related to insecure attachments in both the current family and in the family-of-origin of the parents. Thus, increasing attention is being paid to the processes of intergenerational transmission of attachment as a means of understanding psychopathology (Jacobvitz, Morgan, Kretchmar, & Morgan, 1992; Sroufe & Fleeson, 1986; Sroufe, Jacobvitz, Mangelsdorf, DeAngelo, & Ward, 1985). For instance, pathological role-reversal within a family may emerge when parents whose own attachment needs were unmet as children turn to their children to satisfy these needs. Or a parent may interfere with a child's independent exploration because her own lack of a secure base as a child taught her the danger of separateness and autonomy. Or a child's self-destructive behavior may be his means of keeping a disengaged parent involved in the family, thus maintaining his access to his attachment figure. This attachment perspective has proven useful in guiding intervention with troubled families (Byng-Hall, 1991; Marvin & Stewart, 1990).

Others also have recently focused attention on clinical intervention from an attachment perspective. First of all, Bowlby (1988) has described ways in which attachment theory can influence the clinician's work. This consists in large part of the therapist serving as an available and accepting attachment figure for patients, providing them with a secure base from which to explore their own feelings and behaviors. Of particular relevance is the extent to which earlier attachment relationships may be contributing to problems in current functioning and relationships. Second, a new model for treatment of children's conduct problems has been proposed (Speltz, 1990). This model, which combines traditional behavioral operant conditioning techniques with an attachment perspective, is based on the assumption that "in many cases, behaviors commonly labeled as 'conduct problems' can be viewed as strategies for gaining attention or proximity of caregivers who are unresponsive to the child's other signals" (Greenberg & Speltz, 1988, p. 206). Third, new early intervention work, aimed at reducing the incidence of insecure attachment during the first years of life, is emerging (Lieberman, Weston, & Pawl, 1991; Van den Boom, 1990).

Summary

It is clear that during the first year of life nearly all infants become attached to one or a few individuals with whom they have close contact (Ains-

worth, 1967; Schaffer & Emerson, 1964). According to attachment theory, this nearly universal phenomenon is thought to result from the process of natural selection whereby infants predisposed to become attached to their caregivers survived to procreate and to contribute to the population's gene pool (Bowlby, 1969/1982). In addition to a predisposition to become attached, infants are thought to inherit the flexibility to tailor the specific organization of their attachment system to the environmental circumstances in which they are raised (Main, 1990). It is this flexibility, in combination with temperamental variation, that gives rise to individual differences in quality of attachment: security versus insecurity. Because attachment is so central to infants, the ways in which their attachment behavior is responded to is thought to have major implications for later personality development, with major traumas and disruptions contributing to psychopathology.

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26 / The Psychophysiology of Temperament

Stephen W. Porges and Jane Doussard-Roosevelt

Overview

Contemporary theories of temperament have assumed that behavioral patterns are stable and are mediated by a physiological substrate. There is much debate about whether the physiological substrate represents either direct genetic influences or an interaction between genetic and environmental factors. Thus, data demonstrating physiological precursors or parallels of behavioral patterns do not confirm that the differences are genetic or immutable via environmental influences. In this chapter we present a view that various behavioral patterns are determined by the physiology of the child. However, within this presentation, we acknowledge that environmental factors (i.e., perinatal events, nutrition, illness, health care, stress, parenting style, social interactions, etc.), including impact of the child's behavior on the environment, may influence the physiology of the child and thus contribute to his or her expressed temperament.

Although theorists differ in their definitions of temperament (for a review see Seifer & Sameroff,

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