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The Attachment Behavioral System in Adulthood:  
Activation, Psychodynamics, and Interpersonal Processes

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Running Head: THE ATTACHMENT BEHAVIORAL SYSTEM

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*My life's work has been directed to a single aim. I have observed the more subtle disturbances of mental function in healthy and sick people and have sought to infer – or, if you prefer it, to guess -- from signs of this kind how the apparatus which serves these functions is constructed and what concurrent and mutually opposing forces are at work in it. --Sigmund Freud (1961/1930, p. 208)*

*As my study of theory progressed it was gradually borne in upon me that the field I had set out to plough so lightheartedly was no less than the one that Freud had started tilling sixty years earlier, and that it contained all those same rocky excrescences and thorny entanglements that he had encountered and grappled with – love and hate, anxiety and defense, attachment and loss. – John Bowlby (1982, p. xxvii)*

Psychology has changed its focus several times during its relatively short history – psychoanalysis, behaviorism, cognitivism, and neuroscience being prominent examples. Within such conceptual traditions, an emphasis on the individual and the individual's selfish motives often gives way, over time, to an emphasis on social interrelatedness. Freud's psychoanalytic theory of drives or instincts, for example, evolved into later theories of "object relations" (a misleading name for social relations) and "intersubjectivity." Behaviorism focused first on the individual's drives and the role of drive-reduction in learning, but then gradually made room for social learning. The "cognitive revolution," aimed originally at such topics as perception of letters and memory for words, generated the field of social cognition that deals with person perception and social memory. More recently, neuroscience has bred cognitive neuroscience, which in turn is generating social cognitive neuroscience.

These days, no one doubts that the human mind/brain is a social machine. By evolutionary standards, the large human cerebral cortex (including the very large frontal lobes and special modules for language) developed surprisingly rapidly, primarily to serve increasingly complex interpersonal functions (cooperative hunting and child-rearing, for example;

identification of reliable mates and allies as well as detection of cheaters and scoundrels).

Assuming, as we do, that major contributors to the different traditions in psychology all had valuable insights and solid reasons for pursuing their particular angles on human experience and behavior, we wish to combine them to form a powerful, integrative theory of the social mind. In so doing, we take as primary guides the British psychoanalyst John Bowlby and his North American research collaborator Mary Ainsworth. These investigators combined key insights of psychoanalysis, ethology, developmental psychology, and cognitive psychology to create a theory of “attachment,” or emotional bonding, that has been tested and elaborated in literally thousands of studies over the past 30 years. Both Bowlby and Ainsworth were unusually talented analytic thinkers and clear writers who respected the scientific method. Bowlby was notable for the breadth and openness of his mind, Ainsworth for her keen observational skills and methodological creativity. Together they laid a foundation for studying close interpersonal relationships across the lifespan.

Our work can be better understood if we explain briefly how we came, individually, to attachment theory and then began to influence each other and, eventually, work together. Both of us were attracted to psychoanalytic theory as undergraduates, despite the hard knocks it has always taken from diverse critics. Anyone who opens his mind to what goes on in real people’s lives, and anyone who reads novels or poems or watches artful films, realizes that the issues raised by psychoanalysts, beginning with Freud, are important: sexual hunger and attraction; romantic love; the development of personality, beginning in the context of infant-caregiver relationships; negative emotions such as anxiety, sadness, jealousy, guilt, shame, and anger and their role in intrapsychic conflict and psychopathology; intergroup hostility and war.

When we first began studying experimental social psychology, it seemed rather tame and superficial compared to psychoanalysis. But its strong point, and the weak point of psychoanalysis, was a collection of powerful and creative research methods. Psychoanalytic theorists seemed capable of endlessly proliferating and debating hypothetical constructs and processes without being constrained by operational definitions, sound psychometrics, or

replicable research evidence. Both of us began our careers as experimental researchers pursuing existing topic areas (stress and learned helplessness in Mikulincer's case, self-awareness theory and fear of success in the case of Shaver), but our interest in psychoanalytic ideas never abated. When Bowlby's books began to appear, we realized it was possible for a psychoanalytic thinker to amass empirical evidence for important psychoanalytic propositions, and that psychoanalytic theory could be altered and elaborated based on empirical research. Ainsworth's development of a laboratory "strange situation" assessment procedure, which allowed her to classify infants' attachment patterns and relate them systematically to home observations of infant-parent interactions, added to our confidence that research on an appropriately social and evolutionary version of psychoanalytic theory was possible.

In the mid-1980s, Shaver was studying adolescent and adult loneliness (e.g., Rubenstein & Shaver, 1982; Shaver & Hazan, 1984) and noticing both that attachment theory could be useful in understanding loneliness (e.g., Weiss, 1973) and that patterns of chronic loneliness were similar in certain respects to the insecure infant attachment patterns identified by Ainsworth and her colleagues (Ainsworth, Blehar, Waters, & Wall, 1978). Building on this insight, one of Shaver's doctoral students, Cindy Hazan, wrote a seminar paper suggesting that attachment theory could be used as a broad framework for studying romantic love or "romantic attachment," as they called it in their initial article on the topic (Hazan & Shaver, 1987).

That paper caught the eye of Mikulincer, who had become interested in attachment theory while studying affect-regulation processes related to learned helplessness, depression, combat stress reactions, and post-traumatic stress reactions in Israel. He noticed similarities between (a) certain forms of helplessness in adulthood and attachment-figure (e.g., parental) unavailability in infancy; (b) intrusive images and anxiety in the case of post-traumatic stress disorder and the anxious attachment pattern described by Ainsworth et al. (1978) and Hazan and Shaver (1987); and (c) avoidant strategies of coping with stress and the avoidant attachment pattern described by these same authors. In 1990, Mikulincer, Florian, and Tolmacz published a study of attachment

patterns and conscious and unconscious death anxiety, one of the first studies to use the preliminary self-report measure of attachment style devised by Hazan and Shaver (1987).

From that point on, both of us continued to pursue the application of attachment theory to the study of adults' emotions, emotion-regulation strategies, and close relationships, noticing that we were both interested in the experimental study of what might be called attachment-related psychodynamics: the kinds of mental processes, including intense needs, powerful emotions, and defensive strategies, that had captivated both Freud and Bowlby. In recent years we have pooled our efforts to work out a more carefully articulated statement of our theoretical ideas. In the present chapter we summarize what we have learned to date, placing primary emphasis on our own ideas and research (in line with the policy of the *Advances* series) rather than attempting to provide a comprehensive review of the entire adult attachment literature.

The chapter is organized as follows: We begin with an overview of basic theoretical concepts, which will be essential for understanding the remainder of the chapter. We then present an integrative model of attachment-system dynamics in adulthood, a model that has both guided our research and been affected by it. These two theoretical sections of the chapter constitute roughly a third of its length, which is perhaps unusual in a chapter designed to summarize research. In the present case, the research makes better and deeper sense if the reader understands the theory. The subsequent sections of the chapter summarize the diverse empirical studies motivated by the theory and review a variety of unresolved conceptual and empirical issues that provide an agenda for future research.

### *Basic Theoretical Concepts*

We begin by introducing basic concepts in Bowlby's (1982/1969, 1973, 1980) attachment theory, briefly covering both the normative (general) aspects of what he called the attachment behavioral system and individual differences in what social psychologists call "attachment style" (Levy & Davis, 1988). These styles, first noticed and delineated by Ainsworth (1967; Ainsworth et al., 1978) are thought to emerge over the course of development from countless interactions between the attachment system and its interpersonal environment.

*Normative Components of the Attachment Behavioral System*

*What is a behavioral system?* Bowlby (1982/1969) defined a behavioral system as a species-universal program that organizes an individual's behavior in functional ways – i.e., in ways that increase the likelihood of survival in the face of particular environmental demands. A behavioral system is an inborn, pre-set program of the central nervous system that was 'designed' by evolution via natural selection. It governs the choice, activation, and termination of behavioral sequences that produce a predictable and generally functional change in the person-environment relationship. (The term "behavioral system" therefore implies the involvement of actual behavior and behavior generation, although it points theoretically to the central neural program we are emphasizing.) Each behavioral system (e.g., attachment, caregiving, exploration, affiliation) follows a particular predictable pattern of activation and termination in almost all members of a species, a pattern that does not depend on learning opportunities.

Conceptually, a behavioral system has six components or aspects: (a) a specific biological function that increases the likelihood of an individual's survival and reproductive success; (b) a set of contextual activating triggers; (c) a set of interchangeable, functionally equivalent behaviors that constitute the primary strategy of the system for attaining a particular goal state; (d) a specific set-goal – the change in the person-environment relationship that terminates the activation of the system; (e) the cognitive operations involved in the functioning of the system; and (e) specific excitatory or inhibitory neural links with other behavioral systems.

*Biological function of the attachment system.* According to Bowlby (1982/1969), the biological function of the attachment behavioral system is to protect a person (especially during infancy) from danger by assuring that he or she maintains proximity to caring and supportive others ("*attachment figures*"). In his view, natural selection favored maintenance of proximity to attachment figures (what Bowlby, 1973, called "stronger and wiser" caregivers), because it increases the likelihood of survival and eventual reproduction on the part of members of a species born with immature capacities for defense from predators and other dangers. Because

infants require a long period of protection, they are born with a tendency to seek proximity to others who can provide care and support.

Although the biological function of the attachment behavioral system is most critical during the early phases of life, Bowlby (1988) assumed the system is active over the entire life span and is manifested in thoughts and behaviors related to seeking proximity to attachment figures in times of need. In his view, proximity seeking is a behavioral adaptation to evolutionary pressures that can contribute to adjustment and health throughout the lifespan. This function of the attachment system is most relevant during stressful periods or traumatic experiences, wherein the support and comfort given by attachment figures enhance coping and adjustment.

During infancy, primary caregivers (usually one or both parents) are the main attachment figures. In adulthood, however, a wide variety of relationship partners can act as attachment figures, including parents, friends, and romantic partners. Moreover, groups, institutions, and abstract or symbolic figures (e.g., God) can become targets of proximity seeking in times of need. There are also context-tailored attachment figures, who are sources of support only in specific milieus: teachers and supervisors in academic settings; therapists in therapeutic settings; and managers in organizational settings. Attachment theory conceptualizes attachment figures as forming a hierarchical network, with the primary attachment figures being those with whom the individual maintains long-term and strong affectional bonds (parents, close friends, spouses).

*The attachment system's activating triggers.* Originally, Bowlby (1982/1969) claimed that the attachment system is activated by environmental threats that endanger a person's survival. Encounters with such threats create a need for protection from other people and automatically activate the attachment system. When no threat is present, there is no need to seek care from others and no proximity-seeking tendency is activated, at least not for the purposes of protection. (A person may seek proximity to others for the purpose of some other behavioral system such as affiliation or sexual mating.) In subsequent writings, Bowlby (1973) extended this reasoning and proposed that the attachment system is also activated by "natural clues of danger" – stimuli that are not inherently dangerous but that increase the likelihood of danger

(e.g., darkness, loud noises, isolation) – as well as by attachment-related threats such as impending or actual separation from, or loss of, attachment figures. In his view, a combination of attachment-unrelated sources of threat and lack of access to an attachment figure compounds distress and triggers the highest level of attachment-system activation.

*The primary attachment strategy.* According to Bowlby (1982/1969), proximity seeking is the natural and primary strategy of the attachment behavioral system when a person has a perceived need for protection or support. This strategy consists of a wide variety of behaviors that have a similar meaning (the seeking of proximity) and serve similar adaptive functions (protection from threats). Among these behaviors, one can find signals (interaction bids) that tell a relationship partner an individual is interested in restoring or maintaining proximity; overt displays of negative emotion (e.g., anger, anxiety, sadness) that drive the relationship partner to provide support and comfort; active approach behaviors that result in greater physical or psychological contact, including what Harlow (1959) called “contact comfort”; and explicit requests for emotional or instrumental support. According to Bowlby (1982/1969), not all of these behaviors are likely to be manifested in every threatening situation. Rather, they are part of a repertoire of behaviors from which an individual can ‘choose’ (consciously or unconsciously) the most adequate means for attaining protection in a given situation.

In adulthood, the primary attachment strategy does not necessarily lead to actual proximity-seeking behavior. In fact, this strategy can be manifested in the activation of mental representations of relationship partners who regularly provide care and protection. These cognitions can create a sense of safety and security, which helps a person deal successfully with threats. That is, mental representations of attachment figures can become symbolic sources of protection, and their activation can establish what might be called symbolic proximity to supportive others. Of course there are times when these strategies are insufficient and even adults seek actual proximity to attachment figures.

*Set-goal of the attachment system.* Bowlby (1982/1969) viewed the attainment of actual or perceived protection and security as the set-goal of the attachment system, which normally



terminates the system's activation (see also Sroufe, & Waters, 1977, who introduced the term "felt security"). Bowlby also enumerated the provisions attachment figures should supply in order to facilitate the attainment of this set-goal (see also Hazan & Shaver, 1994). First, attachment figures should be responsive to the individual's proximity-seeking attempts in times of need. Second, these figures should provide a physical and emotional *safe haven* – i.e., they should facilitate distress alleviation and be a source of support and comfort. Third, attachment figures should provide a *secure base* from which the individual can explore and learn about the world and develop his or her own capacities and personality while feeling confident that care and support will be available if needed. When these provisions are supplied, a person feels secure and safe, and proximity seeking for the purpose of protection and care is terminated.

*Cognitive substrate of the attachment system.* According to Bowlby (1982/1969), the attachment system operates in a complex goal-corrected manner; that is, the individual evaluates the progress his or her behaviors are making toward achieving the set-goal and then corrects these behaviors to produce the most effective action sequence. In our view, this flexible, goal-directed and goal-corrected adjustment of attachment behavior requires at least three cognitive operations: (1) processing of information about the person-environment relationship, which involves the monitoring and appraisal of threatening events and one's own inner state (e.g., distress, security); (2) monitoring and appraisal of the attachment figure's responses to one's proximity-seeking attempts; and (3) monitoring and appraisal of the viability of the chosen behaviors in a given context, so that an effective adjustment of these behaviors can be made, if necessary, in accordance with contextual constraints.

Bowlby (1982/1969, 1973) also stressed that the goal-corrected nature of attachment behavior requires the storage of relevant data in the form of mental representations of person-environment transactions. He called these representations *working models* and seemed to intend the word "working" to carry two senses: (1) the models allow for mental simulation and prediction of likely outcomes of various attachment behaviors (that is, they can provide dynamic, adjustable, context-sensitive representations of complex social situations); and (2) the models are

provisional (in the sense of “working” drafts – changeable plans). Bowlby (1982/1969) distinguished between two kinds or components of working models: “If an individual is to draw up a plan to achieve a set-goal not only does he have some sort of working model of his environment, but he must have also some working knowledge of his own behavioral skills and potentialities” (p. 112). That is, the attachment system, once it has been used repeatedly in relational contexts, includes representations of attachment figures’ responses (*working models of others*) as well as representations of the self’s efficacy and value (*working models of self*). These working models organize a person’s memory about an attachment figure and him- or herself during attempts to gain protection in times of need (Main, Kaplan, & Cassidy, 1985).

*Interplay between the attachment behavioral system and other behavioral systems.*

Encountering threats and experiencing disruptions in felt security activate the attachment behavioral system, which in turn inhibits the activation of other behavioral systems and prevents or hinders engagement in non-attachment activities (Bowlby, 1982/1969). Under conditions of threat, people turn to others as providers of support and comfort rather than as partners for exploratory, affiliative, or sexual activities. Moreover, at such times they are likely to be so self-focused (so focused on their need for protection) that they lack the mental resources necessary to attend empathically and altruistically to others’ needs and engage in caring behavior. Only when relief is attained and a sense of attachment security is restored can the individual deploy attention and energy to other behavioral systems and engage in non-attachment activities. Because of this reciprocal relationship between the attachment system and other behavioral systems, the attainment of attachment security fosters engagement in non-attachment activities such as exploration, sex, caregiving, and affiliation, and allows the individual to distance from an attachment figure with the belief that this figure will be available if needed.

*Summary.* According to Bowlby (1982/1969, 1973, 1980), the attachment system is an inborn regulatory device that has important implications for personality and interpersonal behavior. The system is activated by perceived threats and dangers, which cause the threatened individual to seek proximity to protective others. The attainment of proximity and protection

results in feelings of relief and security as well as positive mental representations of relationship partners and the self. Bowlby (1988) viewed the optimal functioning of this behavioral system as extremely important for the maintenance of emotional stability and mental health, development of a positive self-image, and formation of positive attitudes toward relationship partners and close relationships in general. Moreover, because optimal functioning of the attachment system facilitates relaxed and confident engagement in non-attachment activities, it contributes to the broadening of a person's perspectives and skills as well as the actualization of his or her unique potentialities. To borrow a term from another theoretical tradition, humanistic psychology (e.g., Maslow, Rogers), attachment security is not only an important prerequisite for healthy love but also a major stepping stone to self-actualization.

#### *Individual Differences in the Operation of the Attachment System*

*The role of actual interactions with attachment figures.* According to Bowlby (1973), optimal functioning of the attachment system depends on the availability of one or more attachment figures in times of need and on their sensitivity and responsiveness to the individual's proximity-seeking behaviors. As Cassidy (1999) noted, "whereas nearly all children become attached (even to mothers who abuse them, Bowlby, 1956), not all are securely attached" (p. 7). The quality of interactions with attachment figures in times of need is, according to attachment theory, the major source of individual differences in attachment-system functioning.

On the one hand, when an attachment figure is available, sensitive, and responsive to an individual's proximity-seeking attempts, the attachment figure facilitates the restoration of emotional equanimity and the attainment of a sense of attachment security. As a result, the individual leaves these satisfying interactions with increased confidence in proximity seeking as an effective regulatory strategy, heightened trust in others' availability and responsiveness, and increased confidence in his or her own resources for dealing with stress. Moreover, these interactions reinforce the individual's sense that the world is a safe place populated by people of good will, which allows him or her to form rewarding relationships with others and engage freely in non-attachment activities.

On the other hand, when the attachment figure is not physically or emotionally available in times of need or is not sensitive or responsive to the individual's proximity-seeking attempts, the functioning of the attachment system is disrupted and its set-goal is not attained. In these cases, the individual does not experience distress alleviation. Rather, the distress originally elicited by the encounter with threats is now compounded by serious doubts that safety can be attained, that the world is a safe place, that others can be trusted, and that the self has the resources necessary to manage stress. Needless to say, the resulting sense of vulnerability and uncertainty can interfere drastically with a whole range of life activities.

*Secondary attachment strategies.* Negative interactions with an unavailable and unresponsive attachment figure have an additional immediate effect on attachment-system functioning. These interactions signal that the primary attachment strategy is failing to accomplish its regulatory goal and that pursuing this strategy is exacerbating rather than diminishing distress and insecurity. As a result, the individual is forced to continue to deal with unregulated distress while searching for alternative strategies of affect regulation to replace the primary attachment strategy. Main (1990) labeled these alternatives *secondary attachment strategies*. They are, one might say, the best a person can do under dreadful circumstances.

Attachment theorists (e.g., Cassidy & Kobak, 1988; Main, 1990) have delineated two major secondary attachment strategies that involve either *hyperactivation* or *deactivation* of the attachment system. Hyperactivating strategies are a kind of "fight" (or as Bowlby, 1982/1969, said, "protest") response to the frustration of attachment needs. A hyperactivating individual does not give up his or her proximity-seeking attempts, and in fact intensifies them in order to coerce an attachment figure's love and support. This requires that the vigilance, preoccupation, and energization of behavior typical of short-term bids for proximity on the part of a less anxious individual be maintained more or less constantly, even in the face of repeated evidence of attachment-figure unavailability. In contrast, deactivating strategies are a kind of "flight" reaction to the unavailability of an attachment figure. The deactivating individual gives up his or her proximity-seeking efforts, deactivates the attachment system without restoring a sense of

attachment security, and attempts to deal with dangers alone. Bowlby (1982/1969) called this strategy “compulsive self-reliance.” Individuals who rely on deactivating strategies of affect-regulation try to keep their attachment system down-regulated to avoid the pain and distress caused by attachment-figure unavailability. The two strategies have a variety of psychological and interpersonal costs, which we will address later in this chapter.

*From strategies to mental representations: Generalized individual differences.* Beyond producing immediate individual differences in reliance on a specific attachment strategy during a given interaction, variations in the quality of this interaction can also produce more enduring and generalized individual differences in the functioning of the attachment system. According to Bowlby (1973), this passage from context-tailored variations to person-tailored variations is mediated by the cognitive substrate of the attachment system – working models. Every interaction with an attachment figure can be incorporated symbolically into working models of the self and partner, models that allow a person to predict future interactions with the partner and design new proximity-seeking attempts without rethinking each one from the beginning. In this way, the internalization of a specific interaction can affect the functioning of the attachment system in future interactions with a particular attachment figure, and a strategy choice that was originally manifested in a specific interaction can be generalized to other relational episodes.

According to Main et al. (1985), early working models organize a child’s memory about the self and the partner during attempts to gain security, as well as the typical outcomes of those attempts: successful attainment of security or failure of the primary attachment strategy. In this way, a child can develop working models for successful proximity-seeking episodes, for episodes in which the attachment system had to be hyperactivated, and for episodes in which the system needed to be defensively deactivated. Each of these models consists of episodic memories of the interaction sequence; declarative knowledge about the partner’s responses and the efficacy of the individual’s responses, and procedural knowledge about the ways in which one responds to such situations and deals with different sources of distress.

In our view, the central organizing factor in a working model is the attachment strategy used by the individual in a particular relational episode. These strategies not only shape the procedural knowledge included in the representations but also bias declarative knowledge about the self and the attachment figure according to the goal these strategies are intended to attain (e.g., getting hold of an insufficiently available attachment figure by hyperactivating the attachment system or avoiding punishment or perpetual frustration by deactivating the system). Because of such biases, working models of the self and others reflect only in part the ways the person and the partner actually behaved in a given interaction. They also reflect the underlying regulatory action of attachment strategies that shape cognition, affect, and behavior. That is, working models of self and others are always blended reflections of what actually happened in a social encounter and subjective biases resulting from attachment strategies.

Like other mental representations, which are presumably the psychological manifestation of underlying neural networks, working models form excitatory and inhibitory associations with one other, and the activation of one model primes congruent models and inhibits incongruent models. That is, experiencing or thinking about an episode of security attainment activates memories of other congruent episodes of successful proximity-seeking attempts and renders memories of hyperactivation and deactivation less accessible. With the passage of time and the recurrent retrieval of related memories, these associative links are strengthened and favor the formation of more abstract and generalized representations of attachment-system-functioning with a specific partner. In this way, models of security-attainment, hyperactivation, and deactivation with a specific attachment figure (relationship-specific models) are created, and they form excitatory and inhibitory links with models representing interactions with other attachment figures. With the consolidation of these links, even more generic working models are formed, global representations of the self and others across different relationships. The end product of this cognitive generalization and consolidation process is the formation of a hierarchical associative network, in which episodic memories become exemplars of relationship-specific models, which in turn become exemplars of generic relational schemas. As a result, with respect

to a particular relationship and across different relationships, everyone has models of security-attainment, hyperactivation, and deactivation and so can sometimes think about relationships in secure terms and at other times think about them in more hyperactivating or deactivating terms.

The idea of multiple working models raises questions about the personal and contextual factors that determine which kind of model is activated and used to guide expectations, concerns, and behaviors in a particular interaction with an attachment figure. In our view, this activation depends mainly on the relative strength of a model, which is determined by the amount of experience it is based on, the number of times it has been applied in the past, and the density of its connections with other cognitive representations (see also Collins & Read, 1994; Shaver, Collins, & Clark, 1996). At a relationship-specific level, this idea implies that the model representing the typical interaction with an attachment figure has the highest chance of being activated in subsequent interactions with the same person. At a generic level, the model that represents interactions with major attachment figures (e.g., parents, spouse) becomes the most easily activated and chronically accessible attachment-related representation.

In addition to the history of attachment interactions, features of the current situation also contribute to the activation of a particular working model. For example, clear-cut contextual cues concerning a partner's love, availability, and supportiveness can activate models of security attainment. In addition, working models can be invoked by a person's current motives (e.g., wishing to distance from a partner) or by his or her current mood (Shaver et al., 1996). In our view, the chronically accessible model coexists with less typical working models in the memory network, and these models can be activated by contextual factors or a person's inner state.

The consolidation of a chronically accessible working model is the most important psychological process that explains the passage from context-tailored variations in attachment-system functioning to person-tailored variations. Given a fairly consistent pattern of interactions with attachment figures during childhood and adolescence, the most representative models of these interactions are solidified through thousands of repeated experiences and increasingly become part of the individual's developing personality. Like other mental schemas, these

chronically accessible models tend to operate automatically and unconsciously and are resistant to change. Thus, what began as representations of specific interactions with a specific partner become core personality characteristics and tend to be applied in new situations and relationships where they continue to guide the functioning of the attachment system.

Bowlby (1979) aptly illustrated how these chronically accessible models shape a person's experience. In his words, a person "...tends to assimilate any new person with whom he may form a bond, such as a spouse, or child, or employer, or therapist, to an existing model (either of one or other parent or of self), and often to continue to do so despite repeated evidence that the model is inappropriate. Similarly he expects to be perceived and treated by them in ways that would be appropriate to his self-model, and to continue with such expectations despite contrary evidence" (pp. 141-142).

*Measurement of individual differences: Attachment style.* Most of the research examining individual differences in attachment-system functioning has focused on attachment styles – patterns of expectations, needs, emotions, and social behavior that result from a particular history of attachment experiences, usually beginning in relationships with parents (Fraley & Shaver, 2000). Attachment style reflects the individual's most chronically accessible working models and the typical functioning of his or her attachment system in a specific relationship (relationship-specific style) or across relationships (global or general attachment style). As such, each attachment style is closely tied to working models and reflects the underlying, organizing action of a particular attachment strategy (primary or secondary, hyperactivating or deactivating).

As mentioned earlier, these styles were first described by Ainsworth (1967; Ainsworth et al., 1978) based on her observations of infants' responses to separations from and reunions with mother, both at home and in a laboratory strange situation. Using this assessment procedure, infants are classified into one of three attachment categories: secure, avoidant, or anxious/ambivalent. Recently, a fourth category, "disorganized/ disoriented," has been added. It is characterized by odd, awkward behavior during separation and reunion episodes and random fluctuations between signs of anxiety and avoidance (Main et al., 1985).



Infants classified as secure seem to hold accessible working models of successful proximity-seeking attempts and security-attainment. In the strange situation, they tend to exhibit distress during separation but then recover quickly and continue to explore the environment with interest. When reunited with mother, they greet her with joy and affection, respond positively to being held, and initiate contact with her. During home observations, mothers of these infants are emotionally available in times of need and responsive to their infants' proximity-seeking behavior (Ainsworth et al., 1978). It seems reasonable to characterize these mothers as a source of attachment security and as reinforcing reliance on the primary attachment strategy.

Avoidant infants seem to hold accessible working models of attachment-system deactivation. In the strange situation they show little distress when separated from their mother and avoid her upon reunion. In home-based observations, their mothers tend to be emotionally rigid as well as angry at and rejecting of their infants' proximity-seeking attempts (Ainsworth et al., 1978). Anxious infants seem to hold accessible working models of attachment-system hyperactivation. In the strange situation, they are extremely distressed during separation and exhibit conflictual responses towards their mother at reunion (e.g., they may cling one moment and angrily resist comforting the next, which was Ainsworth's reason for calling them "ambivalent"). During home-based observations, interactions between anxious infants and their mothers were characterized by lack of harmony and lack of caregivers' consistent responsiveness (Ainsworth et al., 1978). Mothers of both avoidant and anxious infants seem to thwart security attainment, thereby fostering the adoption of secondary strategies. However, whereas avoidant infants deactivate the attachment system in response to attachment-figure unavailability, anxious infants tend to hyperactivate the system (Main, 1990; Main et al., 1985).

Disorganized/disoriented infants seem to suffer from a breakdown of organized attachment strategies (primary, hyperactivating, or deactivating). They either oscillate between strategies or do something bizarre like lie face down on the floor without moving or sit under a table, evincing no strategy at all. This pattern of behavior seems to be due to disorganized, unpredictable, and discomfiting behavior on the part of attachment figures who, research shows,

are likely to be suffering from unresolved losses or attachment-related traumas (Hesse, 1999; Lyons-Ruth & Jacobvitz, 1999).

With the extension of attachment research into adolescence and adulthood, new measures of attachment style were created for use with those age groups. Based on a narrative approach, Main and her colleagues (George, Kaplan, & Main, 1985; Main et al., 1985; see Hesse, 1999, for a review) devised the Adult Attachment Interview (AAI), in which participants answer open-ended questions about their childhood relationships with parents. In the AAI, interviewees are classified into three primary categories that parallel Ainsworth's infant-mother attachment typology: "secure" (or free and autonomous with respect to attachment), "dismissing" (of attachment), or "preoccupied" (with attachment). If a narrative contains indications of unresolved traumas or losses, it gets a secondary classification of "unresolved."

AAI narratives are coded as indicative of secure working models if an interviewee describes positive relationships with parents in a clear, convincing, and coherent manner or if negative relationships are described coherently with some degree of perspective. The narratives are coded as indicative of dismissing attachment if the interviewee dismisses the importance of attachment relationships or idealizes them and provides no clear examples to support his or her characterizations. This category parallels Ainsworth's avoidant style and reflects the underlying action of deactivating strategies. The narratives are coded as preoccupied if the interviewee is entangled in still-intense worries and conflicted feelings about parents, can easily retrieve attachment-related memories, but has trouble coherently discussing them without anger or anxiety. This category parallels Ainsworth's anxious style and reflects the underlying action of hyperactivating strategies.

Despite the richness of AAI narratives, the interview is expensive to administer and score and it deals almost exclusively with memories of child-parent relationships. Given that we are primarily interested in attachment behavior in the context of adult close relationships and would like to be able to run large questionnaire and experimental studies in a reasonably short period of time, our research program relies on simple self-report measures of attachment style.

The first such measure was constructed by Hazan and Shaver (1987, 1990) for their studies of romantic attachment. In its original form, the measure consisted of three brief descriptions of feelings and behaviors in close relationships that were intended to parallel Ainsworth's three types of infants. Participants were asked which of the three descriptions best characterizes them in close relationships (see Table 1). However, subsequent studies (e.g., Bartholomew & Horowitz, 1991; Brennan, Clark, & Shaver, 1998; Fraley & Waller, 1998) revealed that attachment styles are best conceptualized as regions in a two-dimensional space, which conceptually parallels the space defined by two discriminant functions in Ainsworth et al.'s (1978) summary of research on infant-mother attachment (Figure 10, p. 102). The two dimensions defining the space are called *attachment anxiety* and *attachment avoidance* (Brennan et al., 1998). (See Fraley & Spieker, in press, for a similar analysis of individual differences among infants in the strange situation.)

In the two-dimensional attachment-style space (see Figure 1), what was formerly called the "secure style" is a region in which both anxiety and avoidance are low. This region is defined by a sense of attachment security, comfort with closeness and interdependence, and reliance on the primary attachment strategy in times of need. What was formerly called the "anxious style" refers to the region in which anxiety is high and avoidance is low. This region is defined by a lack of attachment security, a strong need for closeness, worries about relationships, and reliance on hyperactivating strategies. What was called the "avoidant style" refers to a region in which avoidance is high. This region is defined by a lack of attachment security, compulsive self-reliance, preference for emotional distance from others, and reliance on deactivating strategies. In Ainsworth et al.'s (1978) research, avoidant infants occupied mainly the region where avoidance is high and anxiety is low. In adult attachment research, Bartholomew and Horowitz (1991) drew a distinction between "dismissing avoidants" (high on avoidance, low on anxiety) and "fearful avoidants" (high on both avoidance and anxiety).

Because several different measures have been used to study adult attachment, some based on three categories, some on four categories, and some on two dimensions, it is somewhat

difficult to summarize results of studies on a particular topic without constantly raising the issue of measurement. Here, we will generally summarize results in terms of “secure,” “anxious,” and “avoidant” attachment patterns, unless some feature of the results requires reference to the distinction between fearful and dismissing avoidance or to simultaneously high scores on both the attachment anxiety and attachment avoidance dimensions. The issue of “fearful avoidance” is, in any case, less likely to arise in normal samples of college students and community adults. Extremely high scores on both the anxiety and avoidance dimensions are more common in samples of abused or clinical samples (see Shaver & Clark, 1994, for a review), where “disorganized” attachment behavior is a consequence of maltreatment or other contributors to psychopathology. In most of our studies, the results can be adequately described in terms of either anxiety or avoidance.

At present, a person’s locations on the two dimensions are measured with two reliable 18-item Likert scales created by Brennan et al. (1998) based on factor analyses of previous measures. The two scales are reliable in both the internal-consistency and test-retest senses and have high construct, predictive, and discriminant validity (Crowell, Fraley, & Shaver, 1999). The following items are representative of the avoidance scale: “I try to avoid getting too close to my partner,” “I prefer not to show a partner how I feel deep down,” and “I turn to my partner for many things, including comfort and reassurance” (reverse scored). The following items are taken from the anxiety scale: “I need a lot of reassurance that I am loved by my partner,” “I do not often worry about being abandoned” (reverse scored), and “I get frustrated if romantic partners are not available when I need them.” The two scales were conceptualized as independent and, like the two discriminant functions reported by Ainsworth et al. (1978), have been found to be uncorrelated in most studies.

It is important to note that despite the substantial differences in focus (parent-child vs. adult-adult relationships) and method (brief self-reports vs. extensive interview transcripts), self-report measures of attachment in close relationships are related to AAI coding scales (Bartholomew & Shaver, 1998). For example, in a study of over 100 married women, Shaver,

Belsky, and Brennan (2000) found that both avoidance and anxiety scores based on self-report scales could be predicted from AAI coding scales. Analyses running in the other direction revealed that every AAI coding scale except one was predictable from self-report items. These findings imply that scores on the two kinds of measures are related to each other in sensible ways, and that both are reflections of an underlying sense of attachment security, even though their differences in focus, method, and interpretation make them inappropriate substitutes for each other in research.

*Summary.* In this section we introduced major individual differences in the functioning of the attachment system. Although the system is an inborn, pre-wired device that presumably operates mainly at a subcortical level and in a reflexive, mechanistic, and unintentional manner, its activation can lead to different response strategies (primary, hyperactivating, or deactivating) depending on both the quality of the *current* interaction with an actual attachment figure and internal representations of *past* interactions with the same or other attachment figures. These representations (working models of self and others) presumably operate in a more cortical, reflective, constructive, and intentional manner (although they can become habitual and automatic, and can be held out of consciousness by defensive maneuvers), and can transform context-tailored variations in the activation of specific attachment strategies to person-tailored variations. That is, they are a source of within-person continuity in attachment-system functioning. In the next section, we present a theoretical framework that makes sense of the cognitive operations and dynamic processes involved in the activation and functioning of the attachment system in adulthood.

#### *An Integrative Model of Attachment-System Dynamics in Adulthood*

In attempting to characterize the dynamics of the activation and functioning of the attachment system in adulthood, we (Mikulincer, Shaver, & Pereg, in press; Shaver & Mikulincer, in press-a, in press-b) have proposed a control-system model that integrates recent findings with earlier theoretical proposals by Bowlby (1982/1969, 1973, 1980), Ainsworth (1991), Cassidy and Kobak (1988), and Main (1995). This model is a conceptual extension and

refinement of previous control-systems representations of attachment-system dynamics presented by Shaver, Hazan, and Bradshaw (1988) and Fraley and Shaver (2000). It includes three components (Figure 2): the primary strategy associated with attachment-system activation, the strategy related to the attainment of a sense of attachment security, and the strategies triggered by attachment-figure unavailability, which lead to a regulatory failure of the attachment system. The model also delineates (a) the main goals of each of these strategies; (b) their declarative knowledge base and procedural rules for managing interpersonal behavior, coping with stress, and processing information; and (c) their implications for self-image, social judgments, mental health, relationship quality, and other behavioral systems.

The first component involves the monitoring and appraisal of threatening events; it is responsible for activation of the attachment system. The second component involves the monitoring and appraisal of attachment-figure availability and is responsible for individual differences in the sense of attachment security and the psychological correlates and consequences of the secure attachment style. The third component involves monitoring and appraisal of the viability of proximity seeking as a way of dealing with attachment insecurity. This component is responsible for individual variations in the use of hyperactivating or deactivating strategies and accounts for the psychological manifestations of attachment anxiety and avoidance. The model also includes hypothetical excitatory and inhibitory ‘neural circuits’ (shown as arrows on the left-hand side of the diagram), resulting from the recurrent use of hyperactivating or deactivating strategies. These circuits affect the monitoring of threats and the monitoring of attachment figures’ availability. All components and circuits of the model can operate either consciously or unconsciously. Moreover, these components and circuits can operate either in parallel or in opposite ways at conscious and unconscious levels. (We will provide concrete examples later in the chapter.)

Our model is sensitive to both context- and person-tailored individual differences. On the one hand, each component of the model can be affected by specific contextual factors (e.g., actual threats, information about attachment-figure availability or proximity-seeking viability),

which initiate a bottom-up process in a person's working models, activating congruent attachment strategies and producing immediate changes in the functioning of the attachment system. On the other hand, each component of the model is affected by the chronically accessible working model, which biases the appraisal of threats, attachment-figure availability, and proximity-seeking viability. These biases are part of a top-down process by which the attachment system functions in accordance with a person's chronic attachment style. Overall, the model gives place to both reality – the current context in which the attachment system is activated – and fantasy, the cognitive biases resulting from attachment strategies.

#### *Activation of the Attachment System*

Following Bowlby's (1982/1969) ideas, we assume that the monitoring of unfolding internal or external events results in activation of the attachment system when a potential or actual threat is perceived. These triggers include both physical and psychological threats. They also include both attachment-unrelated and attachment-related sources of threat. In our view, every unfolding event perceived by a person as threatening his or her sense of security, and consequently his or her adjustment and survival, can activate the attachment system. This activation automatically heightens the accessibility of attachment-related cognitions, which in turn favor the seeking of proximity to supportive others. Although this component of the model represents the normative working of the system, which occurs regardless of individual differences in attachment history and orientation, it is still affected by the excitatory circuits of hyperactivating strategies and inhibitory circuits of deactivating strategies.

In our model, attachment-system activation depends on the *subjective appraisal* of threats rather than their actual occurrence. Although the actual presence of threats is obviously a very important factor, the individual's appraisal of internal or external events as potential or actual threats is the critical factor in activating the attachment system. This idea fits with Lazarus and Folkman's (1984) model of stress and coping, which emphasizes the critical role played by appraisal processes in the regulation of distress and the energization of coping efforts. In fact, the attachment system is designed to cope with threats and regulate distress, and it, like other

regulatory devices, depends on a person's perception that unfolding events are threats that require the mobilization of coping efforts.

We view the appraisal of threats as a product of both the actual presence of threat-related cues and the individual's forecast or expectations that unfolding events may have negative effects on well-being, adjustment, and survival. Although these expectations can follow a rational, conscious risk-analysis of the unfolding events, excitatory and inhibitory circuits resulting from secondary attachment strategies can automatically bias these expectations. That is, the appraisal process is not necessarily conducted at a conscious, rational level and the person may not even be aware of the monitoring and appraisal of threats. These cognitive processes can occur at preconscious levels and be manifested in physiological reactions and the measurable accessibility – readiness to influence information processing – of threat-related thoughts.

Another important feature of our model is that inner sources of threat (e.g., thoughts, imagery) can activate the attachment system. For example, thoughts about personal death are usually appraised as extremely threatening (Greenberg, Solomon, & Pyszczynski, 1997) and so can activate the attachment system. In such cases, the person does not need to actually encounter the threat: Merely being reminded of death is enough to activate the system. Again, these thoughts need not be conscious; they can be activated by a stimulus as minimal as the word “death” presented subliminally (e.g., Mikulincer, Birnbaum, Woddis, & Nachmias, 2000).

These two features – subjective appraisal and the activating power of threat-related thoughts – are critical for delineating the effects of the neural circuits associated with secondary attachment strategies on attachment-system activation. On the one hand, hyperactivating strategies, which maintain the attachment system in a chronically activated state, include vigilance with respect to triggers of attachment-system activation and exaggeration of the threatening aspects of person-environment transactions; they also include rumination on potential threats, which occupies working memory. This means anxiously attached individuals can experience attachment-system activation in the absence of any consensual, external sign of danger. On the other hand, deactivating strategies, which maintain the attachment system in a



down-regulated or inactive state, foster the ignoring or dismissal of threatening aspects of person-environment transactions and the suppression of any threat-related thought that might activate the attachment system. This means that avoidant individuals can distance themselves from various sources of threat and keep themselves from thinking about either their need for protection or the relief that might be found in the presence of a loving and protective partner.

Once a threat is appraised, attachment-system activation is automatically manifested in heightened accessibility of attachment-related nodes within the associative memory network. These nodes include internal representations of security-enhancing attachment figures; episodic memories of supportive and comforting interactions with these figures; thoughts related to proximity, love, and support; and proximity-seeking goals. These preconsciously activated nodes become ready for use in subsequent information processing and can shape a person's state of mind and influence his or her behavioral plans even before they are consciously formulated. This idea fits with recent findings from social cognition research showing that accessible cognitive material can shape a person's state of mind before he or she recognizes the material in the stream of consciousness (Wegner & Smart, 1997). It is also congruent with the "auto-motive" model (Bargh, 1990), which suggests that goals can be preconsciously activated and this preconscious activation can automatically guide a person's behavior without the mediation of conscious behavioral planning.

This automatic, preconscious accessibility of attachment-related memory nodes is the normative manifestation of attachment-system-activation in adulthood. We assume that age and development result in an increased ability to gain security from internalized representations of security-enhancing attachment figures without necessarily causing a person to actually seek proximity to these figures. This cognitive activation maintains symbolic proximity to figures who in the past provided security and safety. That is, the regulatory action of the adult attachment system can occur intrapsychically without a person's awareness. However, like Bowlby (1982/1969), we assume that no one of any age is completely free of dependence on others. There are situations, such as physical and psychological traumas, illnesses, or losses, in

which symbolic proximity to internalized figures is not sufficient to provide a sense of security, and in such situations attachment-system-activation leads to proximity-seeking behavior. There are also developmental stages, such as old age, that tax people's physical and psychological resources to the point where it becomes necessary to seek proximity to and support from others.

Overt manifestations of attachment-system activation in conscious thoughts, behavioral intentions, and actual behaviors are dependent on contextual, cultural, and personal factors and do not necessarily follow directly from the accessibility of attachment-related nodes.

Furthermore, variations in proximity-seeking behavior are more a reflection of the underlying action of attachment strategies than of attachment-system activation itself. In fact, people differing in attachment style differ in their tendency to seek actual proximity in times of need.

These individual differences are also manifested in the content of the attachment-related nodes that are automatically activated by threat appraisal. For people with a history of security attainment and a secure attachment style, threat appraisal makes accessible thoughts about typical, positive interactions with attachment figures – i.e., thoughts of proximity, support, love, comfort, and relief. However, for persons with a painful history of attachment interactions and an insecure attachment style, threat appraisal can make accessible many negative attachment-related thoughts (e.g., thoughts about separation and rejection). These people's frustrating attachment experiences may create an associative link in their memory networks between activation of the attachment system and worries about separation or rejection, so that the accessibility of these worries increases every time attachment needs are activated.

In sum, the appraisal of unfolding events as threatening automatically activates attachment-related nodes in the associative memory network and preconsciously activates internalized representations of attachment figures and proximity-seeking goals. This activation can remain at the preconscious level and be a source of comfort. However, it can also be manifested in attachment-related conscious thoughts and actual proximity-seeking behaviors, depending on contextual factors and the person's attachment style. Attachment style is also a

source of individual differences in threat appraisal and the specific content of the attachment-related nodes activated by the perceived threat.

### *Attachment-Figure Availability and Security-Based Strategies*

Once the attachment system is activated, an affirmative answer to the question, “Is the attachment figure available?” results in a sense of attachment security and positive models of the self and others. Attachment-figure availability also reinforces the perceived effectiveness of the seeking of proximity and fosters the development of what we call *security-based strategies*. The goals of these strategies are to form and maintain close bonds with others, alleviate distress, and bolster personal adjustment through constructive, flexible, and reality-attuned mechanisms. Moreover, they create what we, following Fredrickson (2001), call a “broaden and build” cycle of attachment security, which builds a person’s resources for maintaining emotional equanimity in times of stress and broadens his or her perspectives and capacities.

In the long run, repeated episodes of attachment-figure availability have a powerful and enduring impact on intrapsychic organization and interpersonal behavior. At the intrapsychic level, these episodes lead to the consolidation of security-based strategies as the main method of affect regulation and of secure working models of self and others as the most chronically accessible cognitive representations. At the interpersonal level, these episodes foster the enactment of a secure attachment style in social situations and close relationships. Security-based strategies and the resulting “broaden and build” cycle of attachment security can be viewed as the core characteristics of securely attached persons.

As in the system-activation module, the answer to the question about attachment-figure availability in the second module depends on subjective appraisal of this availability and can be biased by attachment strategies. The neural networks or circuits of insecure persons make the positive appraisal of attachment-figure availability unlikely. Anxious persons’ hyperactivating strategies intensify the vigilant monitoring of attachment-figure behaviors and slant perceptions in the direction of noticing or imagining insufficient interest, availability, and responsiveness. As a result, the likelihood of detecting signs of distance, rejection, and unavailability is increased,

because the attachment figure cannot always be available and totally at the disposition of the attached person's needs. Avoidant individuals' deactivating strategies interfere with the monitoring of cues concerning either the availability or unavailability of the attachment figure, increasing the likelihood that genuine and clear-cut signals of attachment-figure availability will be missed. In contrast, security-based strategies facilitate the appraisal of attachment-figure availability – they reflect a positive view of relationship partners as available and supportive, and favor the ignoring or downplaying of episodes of momentary unavailability.

These cognitive biases are amplified when attachment nodes in the memory network are preconsciously activated. At the preconscious level, appraisal of attachment-figure availability depends entirely on the type of internalized figure, available or unavailable, that is activated. Insecurely attached persons tend to give a negative answer to the question of attachment-figure availability, because they have chronic access to representations of unavailable figures and these representations become increasingly accessible when attachment nodes are activated. More securely attached people, however, tend to give a positive answer to this question, because they have chronic access to representations of available figures and their attachment nodes are linked with a host of associations and memories of security-enhancing attachment figures.

Despite these cognitive biases, however, reality is still important in the appraisal of attachment-figure availability. In our view, the actual presence of an available attachment figure or contextual cues that activate representations of available attachment figures (thinking about one of these figures) can lead people to give an affirmative answer to the question of attachment-figure availability. These contexts, mainly when they are clear-cut, personally meaningful, and stable over time and situations, can counteract even insecure people's tendencies to negate the availability of attachment figures, and can set in motion the "broaden and build" cycle of attachment security. That is, these contextual cues can influence the appraisal of attachment-figure availability beyond the cognitive biases resulting from attachment strategies. Accordingly, these cues can activate security-based strategies even among chronically insecure persons.

Security-based strategies include three core beliefs: optimistic beliefs about distress management, a sense of trust in others' availability and good will in times of need, and a sense of self-efficacy in dealing with threats. These beliefs are a direct result of positive interactions with available attachment figures. During these interactions, individuals learn that distress is manageable and external obstacles can be overcome. Moreover, they learn about others' positive responses to attachment behaviors and about the control one can exert over the course and outcome of threatening events. In our view, these cognitive acquisitions are the building blocks of a person's capacity for dealing with stress.

The procedural knowledge involved in security-based strategies consists of a set of rules embodied in what H. Waters, Rodriguez, and Ridgeway (1998) called the "secure base script." This hypothetical script is organized around three regulatory tendencies – acknowledgment and display of distress, the seeking of intimacy, closeness, and support, and engagement in instrumental problem solving. The "emotion-focused coping" components of this script (Lazarus & Folkman, 1984) – acknowledging and expressing feelings and seeking emotional support – work in the service of alleviating distress so that "problem-focused coping" components – seeking instrumental support and solving problems – can proceed successfully. Again, these tendencies seem to stem from prior appraisals of attachment-figure availability and consequent confirmations that proximity seeking results in protection, support, and relief of distress. Relatively secure individuals have learned that acknowledgment and display of distress elicit positive and supportive responses from others. They have also learned that their own actions are often able to reduce distress and remove obstacles, and that turning to others when threatened is an effective route to enhanced coping.

These regulatory strategies are directly manifested in interpersonal behaviors and close relationships. One basic declarative component of security-based strategies is the knowledge, or belief, that proximity maintenance is rewarding and that relationships are an adequate framework for satisfying one's needs. As a result, these strategies predispose people to feel comfortable with intimacy and interdependence, emphasize the benefits of being together, and organize their

interaction goals around the search for intimacy. Another declarative component of security-based strategies is the belief in others' good will, which fosters a sense of trust, gratitude, and affection toward a relationship partner as well as tolerance for ambiguous or negative partner behaviors. These strategies also include a positive attitude toward affect display, which heightens the readiness to self-disclose and share personal feelings with a relationship partner.

Security-based strategies are also manifested in the process of coping with stress and the management of negative emotions. Secure individuals' optimistic and constructive attitude toward life's difficulties leads them to adopt what Epstein and Meier (1989) called constructive ways of coping – active attempts to remove the source of distress, manage the problematic situation, and restore emotional equanimity without creating negative socio-emotional side effects. These constructive ways of coping consist of active problem solving as well as transformational strategies that involve symbolically transforming unsolvable problems into meaningful, growth-promoting challenges. They also include reliance on close relationships as an anxiety buffer and the seeking of proximity and support as a means of coping with stress.

The constructive nature of security-based strategies is enhanced by their flexibility and reality-attunement. Optimistic beliefs about self-efficacy and distress management allow people to open their cognitive structures to new, even threatening, information, and then to flexibly adjust their strategies for dealing realistically with environmental demands. Experiencing, or having experienced, attachment figures as approving allows people to revise erroneous beliefs without excessive fear of criticism or rejection, thus avoiding the cognitive and motivational entrapment that results from being unable to revise beliefs. Furthermore, the building of a person's resources for dealing with stress makes it less necessary to rely on maladaptive means of coping, including primitive defense mechanisms that distort perceptions and generate interpersonal conflicts.

In our view, the adoption of security-based strategies epitomizes optimal functioning of the attachment system. Such strategies are expected to contribute directly to the development of generalized positive representations of others, the consolidation of a stable sense of self-efficacy

and self-esteem, the maintenance of mental health and adjustment in times of stress, and the formation of long-lasting, satisfying close relationships. Moreover, these strategies facilitate the deployment of resources to other behavioral systems, such as exploration, sex, caregiving, and affiliation, and thereby contribute to the broadening of a person's perspectives and capacities. The sense of attachment security allows people to engage in exploratory activities, enjoy sex and social interactions, and be attentive and responsive to others' needs. Moreover, with confidence that support is available when needed, people can take risks and engage in autonomy-promoting activities. In other words, security-based strategies facilitate the development of autonomy, individuality, and self-actualization.

#### *Proximity-Seeking Viability and Secondary Attachment Strategies*

Attachment-figure unavailability results in attachment insecurity and compounds the distress anyone might experience when encountering a threat. We claim that this painful state forces a decision about the viability of proximity seeking as a means of self-regulation and the subsequent choice of a secondary attachment strategy. As in the two modules of Figure 2 already described, a decision about proximity-seeking viability depends on subjective appraisal processes, which are affected by organismic and contextual cues that will be described later.

*Hyperactivating strategies.* When proximity seeking is appraised as being a viable option if only greater effort is expended, people tend to make very energetic, insistent attempts to attain security – in short, to use *hyperactivating strategies* (Cassidy & Kobak, 1988). The main goal of these strategies is to get an attachment figure who is viewed as unreliable or insufficiently available and responsive to pay attention and provide protection or support. The basic means for attaining this goal is to maintain the attachment system chronically activated until an attachment figure is perceived to be available and to provide safety and security. This strategy involves exaggerating the presence and seriousness of threats and being highly vigilant regarding attachment-figure availability or unavailability, because these cues are highly relevant for security attainment. This constant worry and vigilance increases the likelihood that a person will

notice real or imagined signs of a relationship partner's disapproval, waning interest, or impending departure.

In the long run, repeated episodes of attachment-figure unavailability or non-responsiveness combined with the appraisal of proximity-seeking viability lead to the consolidation of hyperactivating strategies as the main regulatory device. At the interpersonal level, this internal process is manifested in heightened desires for closeness, merger, and security in close relationships together with increased preoccupation with partner's unavailability – the two definitional components of attachment anxiety (Brennan et al., 1998). We view hyperactivating strategies as the key underlying characteristics of the anxious attachment style.

Hyperactivating strategies are sustained by negative declarative beliefs about distress management, others' good will, and one's self-efficacy in dealing with threats. Although these beliefs are developed during negative interactions with insufficiently available, responsive, or reliable attachment figures, they also reflect cognitive biases that overgeneralize past attachment injuries and apply memories about them inappropriately to new situations and partners. They also result from the amplification of threat appraisals that maintain the attachment system chronically activated.

At the interpersonal level, hyperactivating strategies manifest themselves as exaggerations of the primary attachment strategy: constant monitoring of the relationship partner and strong efforts to maintain proximity. They consist of overdependence on a relationship partner as a source of comfort; intense demands for attention and care; strong desire for enmeshment or merger; attempts to minimize cognitive, emotional, and physical distance from a partner; and clinging and controlling behaviors designed to elicit the partner's affection and support. These strategies also reflect a malfunction of the primary attachment strategy produced by exaggerated threat appraisals (i.e., a heightened sense of vulnerability) and exaggerated appraisals of attachment figures' unavailability. This malfunction is evident in anxious persons' hypersensitivity to rejection cues and worries about separation and abandonment.



In the process of coping with threats, hyperactivating strategies are manifested in what Lazarus and Folkman (1984) called “emotion-focused coping” – hypervigilant attention to internal indications of distress. This method of coping consists of intensification of negative emotions, mental rumination on related negative cognitions, self-preoccupation, self-criticism, and overt displays of distress. As a result, anxiously attached individuals have free access to threat-related thoughts and emotions and are unable or unwilling to suppress them.

Intrapsychically, amplification of threat appraisals heightens the chronic accessibility of negative thoughts and makes it likely that new sources of distress will mingle and become confounded with old accessible ones. That is, activation of one cognitive node with a negative emotional tone will automatically spread to other negatively tinged cognitive nodes, because all of these cognitions are maintained simultaneously in working memory. Moreover, this pattern of cognitive activation gives predominance to the affective implications of the information and favors the organization of cognitions in terms of simple, undifferentiated features, such as the extent to which the information is threatening or implies rejection. In this way, hyperactivating strategies create a chaotic mental architecture that is constantly pervaded by negative affect.

The heightened accessibility of threat-related thoughts also creates a mental context that biases the encoding of new information. According to cognitive theories (e.g., Anderson, 1994), this context facilitates the encoding of congruent information (e.g., threat-related cues), while diverting attention away from the encoding of context-incongruent cues. This context also fosters the creation of excitatory links between threat-related information and the large number of congruent cognitions that are highly accessible in the memory network. As a result, this information is encoded at a deep level of processing, which seems to be further exacerbated by mental rumination on threat-related material. In contrast, positive information may be encoded in a shallow way, and then be easily forgotten or recalled in an inaccurate manner.

Hyperactivating strategies have negative implications for anxious persons’ self-image. Overdependence on a partner as the main source of comfort interferes with the formation of a sense of confidence in one’s own abilities and skills. Moreover, the intensification of threat

appraisals causes attention to be directed to self-relevant sources of distress (e.g., thoughts about personal weaknesses, memories of personal failures), thereby fostering chronic doubts about self-worth. The frequent activation of negative cognitions and the deep-level encoding of congruent information also heighten the chronic accessibility of negative self-relevant thoughts, further encouraging the formation of an undifferentiated negative self-image. Beyond these automatic processes, more controlled attempts to achieve some sort of closeness and love can add to a negative self-image – the anxious person may emphasize his or her helplessness and present him- or herself in a negative or needy way to elicit others' compassion and support.

Through three convergent processes, hyperactivating strategies encourage negative appraisals of others: (1) The exaggerated appraisal of attachment figures' unavailability contributes to the formation of a negative global view of others. (2) The frequent activation of negative cognitions primes negative thoughts about others' intentions and responses and makes these thoughts accessible for social judgments. (3) The search for proximity and fusion leads anxious individuals to project their negative self-views onto relationship partners in order to create some sort of consensus and illusory closeness. This projective tendency, which object relations theorists (e.g., Klein, 1940) call "projective identification," results in a negative view of others and an overestimation of self-other similarity. In this way, a negative view of others may be guided, in part, by the search for connectedness and a person's own negative self-views.

Chronic reliance on hyperactivating strategies also places anxious individuals at risk for a variety of emotional and adjustment problems. These strategies impair the ability to regulate negative emotions and lead to intense distress, which continues even after actual threats subside. As a result, the person experiences an endless and uncontrollable flow of negative thoughts and moods, which in turn may lead to cognitive disorganization and, in certain cases, culminate in psychopathology. Specifically, hyperactivating strategies can promote chronic attachment-related and attachment-unrelated anxieties, strong depressive reactions to actual or potential interpersonal losses, and intrusive symptoms following traumatic events (e.g., unwanted trauma-

related thoughts). Moreover, problems in emotion control may be manifested in anger outbursts, impulsive behaviors, and the development of more severe personality disorders.

Hyperactivating strategies also have several negative implications for relationship quality. First, these strategies lead a person to adopt a dependent and needy role that impairs the formation of a mature reciprocal relationship. Second, they lead the person to feel chronically frustrated due to the unfulfilled need for demonstrations of love and commitment. Third, hyperactivating strategies contribute to a catastrophic appraisal of interpersonal conflicts, the perpetuation of the resulting negative affect, and conflict escalation. Fourth, these strategies may lead partners to feel abused by a person's endless demands for security and frequent suspicion and distrust; engulfed by the person's desire for merger; and controlled by his or her clinging behavior and hypervigilance. All of these negative feelings may lead partners to take distance from the demanding person and reject his or her bids for proximity, which in turn may intensify the person's insecurities and worries. In this way, a self-amplifying dyadic cycle of dissatisfaction is created which impairs relationship quality and stability.

Of course, this cycle also depends on the functioning of the partner's attachment system. For example, a securely attached partner can be more tolerant of a person's demands for security, and this tolerance may reduce relational tensions. We will return to this point in a later section in which we extend our intrapersonal model of attachment-system functioning to a systemic model that takes into account the attachment systems of two interacting partners.

Hyperactivating strategies also inhibit the activation of other behavioral systems. People who rely on these strategies are so focused on the seeking of protection and security that they have insufficient resources for engaging in non-attachment activities. Such people egocentrically perceive others as a source of comfort and are unable to perceive them as partners for exploration, sex, and affiliation, or as human beings who may also need help and care. They also cannot attain the relatively calm and secure state of mind that is necessary for engaging fruitfully in many non-attachment activities (Weiss, 1998).

*Deactivating strategies.* When proximity seeking is not perceived as viable, people tend to squelch their quest for proximity and inhibit the activation of the attachment system through the use of *deactivating strategies* (Cassidy & Kobak, 1988). These strategies include the denial of attachment needs and the pursuit of excessive self-reliance. They also include downplaying threats and blocking the monitoring of attachment-figure availability, because every thought about threats or attachment figures can re-activate the attachment system. In the long run, repeated episodes of attachment-figure unavailability combined with a negative appraisal of proximity-seeking viability lead to the consolidation of deactivating strategies as the main regulatory device. At the interpersonal level, this internal process is manifested in an avoidant style. We view deactivating strategies as the underlying core characteristics of avoidant persons.

Deactivating strategies consist of negative core beliefs about the relationship partner as a source of protection, combined with positive beliefs about the self as capable of dealing with threats. During their interactions with unavailable attachment figures, individuals relying on deactivating strategies have probably experienced serious doubts about the management of distress, the partner's good will, and the self's capacity for exerting control over the course and outcome of threatening events. However, they must suppress any recognition of personal lack of control, because only a powerful and competent self can handle distress alone. Moreover, such recognition entails the appraisal of the self as a source of threat and the consequent unwanted re-activation of the attachment system. As a result, deactivating strategies include heightened perceptions of self-efficacy.

At the interpersonal level, deactivating strategies represent an inhibition of the primary attachment strategy. People who chronically rely on deactivating strategies have two main goals in social interactions and close relationships: (a) pursuit of distance, control, and self-reliance, and (b) avoidance of negative emotional states that demand attachment-system activation. The first goal is manifested in active attempts to maximize cognitive, emotional, and physical distance from a partner; avoidance of interactions that demand emotional involvement, intimacy, interdependence, and self-disclosure; and suppression of attachment-related thoughts and

emotions that imply a sense of relational closeness, cohesion, and consensus. The second goal is manifested in reluctance to directly or symbolically confront relational tensions and conflicts; unwillingness to deal with a partner's distress and needs for proximity and security; and suppression of thoughts and emotions related to rejection, separation, abandonment, and loss.

In coping with threats, deactivating strategies lead to the adoption of what Lazarus and Folkman (1984) called "distancing coping" – cognitive and behavioral maneuvers aimed at preventing active confrontation with threats and intrusion of threat-related thoughts into consciousness. These strategies consist of dismissal of threats; suppression of threat-related thoughts and feelings; repression of painful memories, diversion of attention away from the threat-related thoughts; and withdrawal of problem-solving efforts. They also consist of detachment from challenging and emotional interactions that potentially constitute sources of threat. These maneuvers inhibit the experience of distress, exclude threat-related cognitions from awareness, and then reduce the need for attachment-system activation.

Deactivating strategies are also manifested in the organization of the cognitive system. The inhibitory circuits established as part of these strategies lower the accessibility of threat- and attachment-related cognitions and inhibit the spread of activation from these cognitions to other, different cognitions. These circuits also create difficulties in encoding material that is congruent with the excluded cognitions. Attention is diverted from threat- and attachment-related information, and when encoded this information is processed at a shallow level because it has no strong excitatory association with the accessible elements of the memory network. As a result, this information is not fully integrated with other parts of the network and is encapsulated in segregated structures. The resulting fractionated cognitive architecture resembles what Bowlby (1980) and George and West (2001) called "segregated systems."

These procedural rules have important implications for avoidant people's self-image. The inhibitory circuits of deactivating strategies divert attention away from self-relevant sources of distress, and can therefore inhibit the appraisal of negative aspects of the self, suppress cognitions about personal weaknesses and imperfections, and repress memories of personal

failures. In this way, deactivating strategies lead to the exclusion of negative self-aspects from consciousness and a conscious sense of high self-esteem. This defensive inflation of self-esteem is further reinforced by the adoption of a self-reliant attitude, which requires enhancement of self-worth, and by strategic attempts to convince others that one does not need their support.

This defensive maintenance of a positive self-image seems to be achieved at the expense of negative beliefs about others. These negative perceptions result from the inhibitory circuits running from deactivating strategies to the monitoring and appraisal of attachment-figure availability. These circuits lead people to divert attention away from any attachment-related information, including information about others' positive traits, intentions, and behaviors. As a result, this information is processed in a shallow manner, is easily forgotten or biased, and is not accessible when making social judgments, which results in the person maintaining a negative and inflexible image of others. In addition, the defensive exclusion of negative information about the self and attempts to maintain interpersonal distance facilitate the projection of the excluded information onto a relationship partner, thereby reinforcing the basic negative view of others. This projective tendency, which Freud (1957/1915) called "defensive projection," results in a negative view of others and an overestimation of self-other dissimilarity. Thus, negative perceptions of others related to deactivating strategies may be guided, in part, by a preference for distance and a desire to view the self more positively than others.

Deactivating strategies can be a source of emotional and adjustment problems. Although these strategies lead to the defensive maintenance of a façade of security and calmness, their inhibitory circuits leave the suppressed distress unresolved and impair the ability to directly confront life's adversities. This impairment is particularly likely to be manifested during prolonged, highly demanding stressful experiences that require active confrontation of the problem and mobilization of external sources of support. In these cases, deactivating strategies can produce a sense of inadequacy in coping with stress, a marked decline in functioning, constricted affect, and what Horowitz (1982) called "avoidance-related" post-traumatic symptoms (e.g., psychic numbing, behavioral inhibition, counterphobic activities). All of these

symptoms reflect the inadequacy of deactivating strategies under certain conditions and their failure to restore emotional equanimity. In addition, although deactivating strategies involve suppressing the conscious experience and display of distress, the distress can still be indirectly manifested in somatic symptoms, sleep problems, and other health disorders. Moreover, the negative attitude toward close relationships can channel the unresolved distress into feelings of hostility, loneliness, detachment, and estrangement from others.

Deactivating strategies also have negative implications for relationship quality and stability. First, they lead a person to be emotionally detached from a partner and to form superficial, cool relationships that lack the vitality and bonding power of affection and intimacy. Second, the tendency to avoid confronting relational problems may leave conflicts unresolved and increase a partner's irritation and resentment. Third, deactivating strategies may lead partners to feel frustrated and dissatisfied due to the constant rejection of their bids for intimacy and affection as well as the person's dismissal of, and non-responsiveness to, their signs of distress. As a result, relationship satisfaction can decrease and the likelihood of relationship dissolution can increase.

Deactivating attachment strategies maintain inhibitory links with other behavioral systems. They block cognitive exploration and the incorporation of new evidence and unusual thoughts, because such thoughts may challenge prior knowledge and lead to uncertainty, tension, and confusion. In fact, relaxed exploration and "loosening" of cognitive operations can open the door to threats and dangers, which activate the attachment system. Thus, deactivating strategies favor cognitive closure and rigidity, and block the full activation of the sexual and affiliation systems, because mutual exploration of sexual pleasures with a lover and having flexible, unscripted fun with friends can lead to the sort of intimacy and closeness that avoidant persons are not comfortable dealing with. These strategies also block the activation of the caregiving system, because empathic responsiveness to others' needs entails emotional involvement, acknowledgement of others' distress, and dealing with the closeness that this empathic reaction

implies. The demands of caregiving work against the goals of deactivating strategies – to distance a person from all sources of suffering and all kinds of closeness to others.

### *Summary*

Our model outlines the cognitive operations, response strategies, and dynamics of the attachment system in adulthood. It also describes the goals of each attachment strategy and their psychological manifestations and consequences. Whereas the goals of security-based strategies are to form intimate relationships, to build a person's psychological resources, and to broaden his or her perspectives and capacities, the goal of secondary attachment strategies is to manage attachment-system activation and reduce or eliminate the pain caused by frustrated proximity-seeking attempts. Hyperactivating strategies keep the person focused on the search for love and security, and constantly on the alert for threats, separations, and betrayals. Deactivating strategies keep the attachment system in check, with serious consequences for cognitive and emotional openness. This framework serves as our "working model" for understanding the activation and functioning of the attachment system in adulthood. It also provides a framework for reviewing our research findings, which is the mission of the next section.

### *Empirical Assessments of the Theory*

In this section, we review our research program on adult attachment style. Our studies have examined the three different modules of our model and have empirically assessed our ideas concerning (a) attachment-system activation, (b) attachment-figure availability, (c) the interpersonal and intrapersonal manifestations of attachment strategies, and (d) implications of these strategies for representations of the self and others, mental health, relationship quality, and other behavioral systems. In this review, we will switch back and forth between typological and dimensional terms for attachment styles, because some of our studies were conducted when we still used typological self-report measures and others were conducted with dimensional measures of attachment anxiety and avoidance, such as the Experience in Close Relationships scale (Brennan et al., 1998). As explained earlier, most results can be summarized adequately in terms



of secure, anxious, and avoidant attachment patterns, with the distinction between dismissing and fearful avoidance mattering only occasionally, when abuse or psychopathology are at issue.

### *Studies on Attachment-System-Activation*

Our ideas about the automatic, preconscious activation of the attachment system in adulthood have been examined in a recent series of studies (Mikulincer et al., 2000; Mikulincer, Gillath, & Shaver, in press). These studies have exposed participants to symbolic threat contexts and assessed the effects of threat on the accessibility of thoughts about attachment themes or mental representations of attachment figures. Specifically, they assessed the readiness of these cognitive elements to influence performance on cognitive tasks without asking participants to report whether these cognitions were active in their stream of consciousness.

In Mikulincer et al.'s (2000) studies, the accessibility of proximity themes was assessed in a lexical decision task following priming with a threat-related or neutral word. The lexical decision task required participants to indicate by pressing a computer key whether a string of letters was or was not a word. Priming was accomplished by exposing threat-related or neutral words subliminally for very brief periods of time. Findings supported our hypothesis about the effects of threat on attachment-system activation: Priming with a threat word (e.g., failure, illness, death) led to faster identification of proximity-related words (e.g., love, closeness). This effect was specific to proximity-related words and did not generalize to positive affect words that have no attachment connotation. Moreover, this heightened accessibility of proximity-related thoughts occurred regardless of individual variations in attachment style, suggesting, as expected, that everyone underwent preconscious activation of the attachment system.

Following these studies, Mikulincer, Gillath, and Shaver (in press) conducted three experiments focused on the accessibility of the names of people whom participants listed as security-enhancing attachment figures. Participants filled out the WHOTO scale (Fraley & Davis, 1997; Hazan & Zeifman, 1994), which identifies the names of people who serve as security-enhancing attachment figures. They also provided names of close others who were not mentioned in the WHOTO scale, as well as names of people they knew but with whom they were

not close (known persons) and names of people they did not know at all. They then performed either a lexical decision task or a Stroop color-naming task, providing multiple indicators of the accessibility (as reflected by reaction times, or RTs) of representations of attachment figures, close persons, known persons, and unknown persons after subliminal exposure to either a threat prime (the word failure or separation) or a neutral word (hat, umbrella).

We found that threat contexts activated mental representations of attachment figures but no one else. Across the three studies, participants reacted to threat contexts with heightened accessibility of the names of the people they listed on the WHOTO scale as attachment figures. As compared to subliminal neutral primes, subliminal priming with threat words led to (a) faster identification of names of attachment figures in the lexical decision task and (b) slower RTs in naming the color of the printed names of attachment figures in the Stroop task. In both cases, fast lexical decision RTs and slow color-naming RTs were interpreted as manifestations of heightened activation of representations of attachment figures in threatening contexts. Because priming with threat words increased the accessibility only of representations of attachment figures, we believe we have shown that the mind turns automatically to attachment figures under threatening conditions, as can be documented behaviorally in infants but had previously been a matter of speculation in the case of adults. The activation of representations of attachment figures occurred both when an attachment-unrelated threat word (failure) and an attachment-related threat word (separation) were presented subliminally.

Beyond these normative processes, the priming studies also documented the expected individual differences in preconscious activation of the attachment system and revealed how secondary attachment strategies shape attachment-system activation. In these studies, securely attached people exhibited greater access to thoughts about proximity and love and to the names of attachment figures only in a threatening context, not in a neutral context (Mikulincer et al., 2000; Mikulincer et al., in press). These findings imply that secure individuals' cognitive systems are not chronically occupied with attachment themes or attachment figures. Rather, attachment-related cognitions seem to be adaptively activated when a transaction signals that

some coping action should be taken. Also important is the fact that secure individuals' reactions to threat primes were limited to attachment themes with positive affective connotations.

Mikulincer et al. (2000) found that secure individuals had relatively slow access to words connoting separation and rejection under both neutral and threatening conditions. Their positive working models apparently create a separation in their memory network between attachment-system activation and worries about rejection or separation. For them, thinking about attachment themes seems to include anticipation or attainment of relief.

Anxious individuals' pattern of cognitive activity was virtually opposite to that of secure individuals (Mikulincer et al., 2000; Mikulincer et al., in press). First, anxious people exhibited heightened accessibility of attachment themes and attachment figures' names *in both threatening and non-threatening contexts*. Second, these people evinced heightened access to attachment-related threats (e.g., separation). These findings fit with our ideas about the anxious person's hyperactivating strategies, which seem to be employed even in non-threatening contexts and to increase attention to threat-related cues.

Avoidant individuals yielded a more complex set of findings. In general, their pattern of access to attachment themes resembled that observed among secure persons (Mikulincer et al., 2000; Mikulincer et al., in press). However, there were some important differences between secure and avoidant individuals. For avoidant persons, attachment-related worries were relatively inaccessible even following subliminal priming with the word "death," which is usually a potent activator of attachment-related fears (Kalish, 1985). Moreover, attachment-related worries *did* become accessible to avoidant individuals in response to threat primes when a "cognitive load" was added to the lexical decision task. That is, when avoidant participants had to engage in an additional cognitively demanding task, perhaps robbing mental resources from the defensive exclusion of attachment-related concerns.

Mikulincer, Gillath, and Shaver (in press) reported an additional difference between secure and avoidant individuals. When the subliminal threat prime was the word separation (an attachment-related threat), secure individuals exhibited enhanced access to the names of

attachment figures, whereas avoidant individuals exhibited *decreased* access. There was no such difference when the subliminal prime word was failure, a word not closely related to attachment. It seems, therefore, that the attachment system is preconsciously activated under attachment-unrelated threatening conditions for both avoidant and non-avoidant people, but it is preconsciously inhibited or deactivated under attachment-related threatening conditions (or at least following the threat of separation) if a person is avoidant. Under the latter conditions, avoidant individuals' responses in the lexical decision and Stroop tasks resemble their self-reported feelings and their actual behavior in interpersonal situations. It seems that avoidant adults have learned not to appeal to attachment figures when those figures are threatening to leave – in fact, have learned to inhibit the tendency to seek proximity, which we know they possess, at least in non-attachment-related threat conditions.

Our understanding of avoidant adults is compatible with Ainsworth et al.'s (1978) analysis of the behavior of avoidant infants, whose mothers seemed angrier than the mothers of infants classified secure or anxious, less comfortable with physical contact, and less tolerant of their infants' expressions of vulnerability and neediness. Ainsworth et al. (1978, p. 320) said, for example, “avoidance short circuits direct expression of anger to the attachment figure, which might be dangerous, and it also protects the baby from re-experiencing the rebuff that he has come to expect when he seeks close contact with his mother.” Perhaps when this “short circuiting” is practiced repeatedly, it becomes part of a person's automatic deactivating strategies and is aroused when he or she subliminally registers the word separation. This circuit may allow avoidant people to maintain some degree of proximity to attachment figures without risking the caregivers' disapproval and distancing (Main & Weston, 1982).

Overall, the findings clearly show that threatening stimuli preconsciously activate attachment-related thoughts and mental representations of attachment figures. They also show that anxious persons' hyperactivating strategies lead to attachment-system activation even in neutral contexts and color this activation with worries about separation and rejection. In contrast, avoidant persons' deactivating strategies foster the suppression of attachment-related worries and

inhibit attachment-system activation during encounters with attachment-related threats of separation and rejection.

### *Studies on Attachment-Figure Availability*

Two lines of research provide empirical support for our ideas about the appraisal of attachment-figure availability and the activation or launching of security-based strategies. One line of research has examined the contribution of attachment strategies to the subjective appraisal of the availability and supportiveness of attachment figures. The other line of research has examined effects of the actual presence of an available attachment figure or contextual cues that activate representations of available attachment figures on the enactment of security-based strategies. Overall, these studies clearly indicate that the activation of these strategies depends on the interaction between perceptions of reality and a person's habitual attachment strategies.

The first line of research has been focused mainly on attachment-style differences in the mental representations of the primary caregivers (parents). These studies have consistently shown that both attachment anxiety and attachment avoidance are involved in the appraisal of these figures as unavailable and non-supportive. Using a 37-item adjective checklist to retrospectively assess recollections of childhood relationships with parents, Hazan and Shaver (1987) found that whereas participants who endorsed a secure style described parents as respectful, responsive, caring, accepting, and undemanding, anxious and avoidant participants described almost the opposite of this profile. These results have been conceptually replicated by Mikulincer et al. (1990) and Mikulincer and Nachshon (1991), who used a 12-item adjective checklist in samples of Israeli adults, as well as Rothbard and Shaver (1994), who assessed 15 aspects of the relationship with parents during childhood. Rothbard and Shaver (1994) also reported conceptually similar attachment-style variations in the appraisal of *current* relationships with parents. Secure individuals described their parents at the time the study was conducted as more available, supportive, warm, and respectful than anxious and avoidant participants.

Similar attachment-style differences have been found in subsequent studies based on dimensional measures of attachment style and other techniques for assessing mental

representations of attachment figures. In a nationally representative sample of American adults, Mickelson, Kessler, and Shaver (1997) reported that attachment anxiety and avoidance were associated with memories of less parental warmth during childhood, as assessed by the Parental Bonding Scale (Parker, Tupling, & Brown, 1979). Moreover, Brennan and Shaver (1998) reported that attachment insecurity was associated with memories of less parental acceptance and less parental fostering of independence, as assessed by the Mother-Father-Peer Scale (Ricks, 1985). In an analysis of the content and structure of participants' open-ended descriptions of their parents, Levy, Blatt, and Shaver (1998) found that parental descriptions of participants who reported having a secure style were characterized by greater benevolence, nonpunitiveness, differentiation, and elaboration than the descriptions given by insecure participants.

The contribution of attachment strategies to the appraisal of attachment-figure availability has also been documented in descriptions of other attachment figures. Florian, Mikulincer, and Bucholtz (1995) reported that people who endorsed a secure style perceived their close friends and romantic partner as providing more emotional and instrumental support than anxious and avoidant persons. In a recent diary study in which married participants rated the quality of their spouse's behavior each day for a period of 3 weeks, Mikulincer, Florian, and Hirschberger (2002) reported that both attachment anxiety and attachment avoidance were associated with a daily appraisal of partners' behaviors as reflecting greater unavailability and less supportiveness.

The second line of research has provided important information about the contribution of contextual cues to the activation of security-based strategies. In a recent series of studies (Mikulincer, Hirschberger, Nachmias, & Gillath, 2001; Mikulincer, Gillath, et al., 2001; Mikulincer, Gillath, et al., in press; Mikulincer & Shaver, 2001), we found that different experimental techniques that activate mental representations of available attachment figures led to the activation of security-based strategies even among participants who scored high on attachment anxiety or attachment avoidance. These techniques consisted of subliminal presentation of security-related words such as love and proximity; subliminal presentation of security-related pictures (e.g., a Picasso drawing of a mother cradling an infant in her arms; a

couple holding hands and gazing into each other's eyes); subliminal presentation of the names of persons who were nominated by participants as security-enhancing attachment figures; guided imagery concerning the components of the secure base script; and visualization of the faces of security-enhancing attachment figures. The activation of security-based strategies was manifested in affective ratings of neutral stimuli, responses to out-group members, attitudes toward others' needs, and value priorities. (The specific findings are reviewed in the next section.)

Two recent studies have also examined the effects of the actual presence of an available attachment figure on the activation of security-based strategies. In the diary study of marital interactions, Mikulincer, Florian, and Hirschberger (2002) found that a spouse's contextual availability and supportiveness contributed to the intensity of a person's positive feelings toward the spouse. The more often a spouse's behaviors indicated availability and supportiveness on a given day, the stronger a person's positive feelings towards this person on the same day. This effect was found in both husbands and wives. Importantly, contextual spouse-availability also weakened the effects of anxious individuals' hyperactivating strategies. Although attachment anxiety was associated with less positive feelings toward a spouse during the 3-week period of the study, this association was notably weakened on days when the spouse's behavior reflected availability and supportiveness. However, contextual spouse-availability failed to moderate the effects of attachment avoidance. That is, attachment avoidance was associated with less positive feelings toward a spouse even on days when this spouse behaved in a supportive manner.

Rom and Mikulincer (2002) conducted a naturalistic study in which new recruits to the Israel Defense Forces were randomly divided into small groups and performed three group tasks. After these tasks, external observers rated participants' instrumental functioning (the extent to which they contributed to the completion of the group task) and participants completed Smith, Coates, and Smith's (1999) group attachment scale, tapping attachment anxiety and avoidance toward their specific group. In addition, they rated the level of cohesiveness of their group, a group-level construct that we conceptualize as reflecting the extent to which a group serves safe

haven and secure base functions. That is, high cohesive groups (assessed in terms of the average of all group members' ratings) can contextually activate representations of attachment security and initiate security-based strategies.

Scores on general attachment anxiety and attachment avoidance were associated with poorer instrumental functioning across the groups. In addition, group cohesion contributed to instrumental functioning (the higher the cohesion, the better the instrumental functioning) and to the within-group association between attachment anxiety and instrumental functioning. The higher the cohesion of a group, the weaker the association between a participant's attachment anxiety and his or her instrumental functioning. Interestingly, group cohesion did not moderate the negative association between attachment avoidance and instrumental functioning.

There was an interesting and coherent pattern of associations between general attachment scores and group attachment scores. With regard to group attachment anxiety, people who scored higher on general attachment anxiety tended also to score higher on group-specific attachment anxiety. In addition, group cohesion contributed to group attachment anxiety – the higher the cohesion of a group, the lower the group attachment anxiety – and to the within-group association between general attachment anxiety and group attachment anxiety. The higher the cohesion of a group, the weaker the association between general attachment anxiety and group attachment anxiety. With regard to group attachment avoidance, people who scored higher on general attachment avoidance tended also to score higher on group-specific attachment avoidance. In addition, group cohesion contributed to group attachment avoidance: The higher the cohesion of a group, the lower the group attachment avoidance. However, group cohesion did not contribute to the within-group association between general avoidance and group avoidance.

Overall, these studies have important implications for understanding the interface between the biasing action of chronic attachment strategies and the effects of contextual cues of attachment-figure availability on the activation of security-based strategies. Both top-down and bottom-up processes contribute to the triggering of these strategies. That is, chronic attachment-style differences in the appraisal of attachment-figure availability and contextual cues indicating



the actual presence of an available attachment figure, or activation of mental representations of these figures, made unique contributions to a people's cognitions, emotions, and functioning in a particular situation. Moreover, the actual presence of available attachment figures seemed to weaken the effects of anxious individuals' hyperactivating strategies and to inhibit the activation of these strategies in a particular context (e.g., causing an anxious person to feel less anxious than usual toward a particular group).

Interestingly, the contextual activation of attachment-figure availability failed to moderate the effects of avoidant people's deactivating strategies. That is, deactivating strategies may continue to be used even when actual or symbolic attachment figures are available and supportive. In fact, one of the inhibitory circuits of deactivating strategies is directed against the monitoring of attachment-figure availability, leading avoidant persons to divert attention away from attachment-related cues and dismiss any positive behavior of attachment figures. As a result, these people remain suspicious about others' intentions even when particular others are behaving in a supportive manner.

#### *Studies on the Interpersonal and Intrapersonal Manifestations of Attachment Strategies*

In this section, we review our research findings on the interpersonal and intrapersonal manifestations of attachment strategies. We organize this extensive review in terms of the psychological processes in which the declarative knowledge and procedural rules associated with particular attachment strategies are manifested: the management of interpersonal behavior, the process of coping with attachment-unrelated and attachment-related threats, and the processing of threat-related and attachment-related information.

*Management of interpersonal behavior and close relationships.* Our studies have documented the attachment strategies that are used and applied in the management of interpersonal behavior. Specifically, these studies have focused on attachment-style differences in (a) the way people construe their love experiences and beliefs, (b) the way they manage interpersonal conflicts in close relationships, (c) their proneness to disclose and share personal information and feelings (self-disclosure), and (d) their degree of trust in love relationships.

In the original studies of adult attachment style, Hazan and Shaver (1987) provided initial evidence for the involvement of attachment strategies in the way people construe their experiences of romantic love. In both a newspaper survey of community members and a more typical study of university students, Hazan and Shaver (1987) found that people who classified themselves as securely attached conceptualized their love experiences in terms of the optimistic expectations and main goal of security-based strategies – the formation of intimate and supportive relationships. Specifically, they reported that their love relationships were friendly, warm, trusting, and supportive; they emphasized intimacy as the core feature of these relationships; and they believed in the existence of romantic love and the possibility of maintaining intense love over a long time period.

People with an avoidant style construed their love experiences in line with their characteristic deactivating strategies. They described their romantic relationships as low in warmth, lacking friendly interactions, and low in emotional involvement; and they believed that love fades with time. In contrast, people who reported having an anxious style construed their love experiences in line with three hyperactivating strategies: (a) the search for extremely close relationships; (b) exaggerated monitoring of attachment-figure unavailability, and (c) intensification of negative emotions. These people described their romantic relationships in terms of obsession and passion, strong physical attraction, desire for union with the partner, and proneness to fall in love quickly and perhaps indiscriminately. At the same time, they characterized their lovers as untrustworthy and non-supportive, and reported intense bouts of jealousy and anger toward romantic partners as well as worries about rejection and abandonment. These findings have been replicated in subsequent studies (see Feeney, 1999, for a review).

In one recent study, Mikulincer and Sharir (2002) examined attachment-style differences in conflict resolution strategies (assessed by the Rahim Organizational Conflict Inventory) within romantic relationships. The constructive nature of security-based strategies was manifested in the tendency of secure people to report heightened reliance on effective conflict resolution strategies – compromising and integrating one's own and one's partner's positions. In contrast, persons

who reported having an anxious or avoidant style relied more extensively on less effective conflict resolution strategies (dominating and avoiding strategies), which leave a conflict unsolved and may even lead to conflict escalation. Whereas anxious people's hyperactivating strategies led them to intensify the conflict and fight aggressively with a partner (dominating strategy), avoidant people's deactivating strategies led them to distance themselves from the conflictual situation and avoid confronting the partner (avoiding strategy). These differences fit well with findings from other studies (e.g., Gaines et al., 1997; Pistole, 1989).

In a series of three studies, Mikulincer and Nachshon (1991) delineated the way attachment strategies shape a person's self-disclosure and his or her reactions to a partner's disclosure. The main goal of security-based strategies – formation of intimate relationships – seemed to lead to what Mikulincer and Nachshon (1991) called “responsive self-disclosure.” Secure people were more likely to self-disclose and to be highly responsive to a partner's disclosure. They disclosed more personal information and felt better interacting with a high than a low disclosing partner; they were attentive to the issues raised in the partner's disclosure and expanded upon them in their own discourse (topical reciprocity). According to Berg (1987), both self-disclosure and responsiveness to partner's disclosure are necessary for enhancing intimacy. People who wish to move toward comfortable intimacy should be responsive to a partner's communication, reinforce the partner's confidence in the self's good intentions, and promote more intimate disclosure. The “responsive self-disclosure” exhibited by secure individuals is the best strategy for forming the kind of intimate relationships these people wish to create.

The pattern of self-disclosure shown by avoidant people was a reflection of their deactivating strategies. Because their interaction goal is to maintain distance from others, persons who endorsed an avoidant style reported low proneness to self-disclose, were uncomfortable with a high disclosing partner, and did not disclose personal information even to such a partner. This interaction goal leads to what Mikulincer and Nachshon (1991) called “compulsive closure,” which reflects their reluctance to create open and friendly relationships with others.

For anxious, hyperactivating individuals, what is most important about self-disclosure is that it involves a momentary breaking of boundaries with a partner and meets a need for increased closeness (Berg, 1987). Anxious people can use self-disclosure as a means of merging with others and reducing their fear of rejection rather than as a means for enhancing reciprocal intimacy. As a result, although anxious people were found to report heightened proneness toward self-disclosure, they tended to disclose indiscriminately to people who were not prepared for intensely intimate interactions (strangers, low disclosing partners) and tended to be unresponsive to their partner's disclosure (a pattern reminiscent of the mothers of anxious infants; Cassidy & Berlin, 1994; Main et al., 1985). In fact, anxious people did not usually deal with a partner's disclosed information in their own disclosures, thereby violating Grice's (1989) maxims of good communication, one of the foundations of the AAI scoring system (Hesse, 1999). These attachment-style differences have been conceptually replicated in other studies (e.g., Keelan, Dion, & Dion, 1998; Pistole, 1993).

In a further attempt to delineate the interpersonal components of attachment strategies, Mikulincer (1998a) conducted five studies focused on goals, memories, and experiences related to the sense of trust in love relationships. With regard to trust-related goals, participants who endorsed a secure style reacted in line with the main goal of security-based strategies – proximity seeking. They reported intimacy as the most important trust-related goal, emphasized the impact of trust-validation and trust-violation episodes on their sense of closeness to a partner, and exhibited heightened access to thoughts about intimacy in a trust-related context (faster lexical decision times for intimacy-related words). Anxious people reacted in line with the main goal of hyperactivating strategies – the attainment of a sense of security. They reported security seeking as the most important trust-related goal and showed heightened access to thoughts about security in a trust-related context. For them, episodes in which partners behaved in a responsive way were appraised as contributing to security feelings, whereas betrayal of trust was appraised as hurting these feelings. Avoidant people reacted in line with the main goal of deactivating strategies – attainment of a sense of control. They described control seeking as the most important trust-

related goal and exhibited heightened access to thoughts about control in a trust-related context. In addition, they emphasized the impact of trust-validation and trust-violation episodes on the control they exert over partners' behaviors.

Trust-related memories and experiences were also found to be direct manifestations of attachment strategies (Mikulincer, 1998a). The constructive nature of security-based strategies was evident in the following findings: Secure persons had faster access to trust-validation episodes (i.e., faster recall latency), reported more trust-validation episodes in their current relationship, attached higher importance to these episodes, and appraised them as reflecting their partner's beneficent disposition. The most direct expressions of this constructive attitude were found, however, in secure people's tendency to talk openly with a partner in response to trust betrayal, their ready access to thoughts about this relationship-enhancing strategy in a trust-violation context (faster lexical decision times for the word "talk"), and the way these persons cognitively process trust-violation episodes (Mikulincer, 1998). Specifically, secure persons did not have ready access to trust-violation memories and tended not to appraise these episodes as important or fundamentally related to their partner's personality. These findings reveal some of the cognitive and affective maneuvers used by secure individuals to minimize the distressing impact of a partner's negative behaviors. Such maneuvers include the suppression of memories that raise doubts about a partner's good will and the dismissal of trust-violation events. These reactions fit with Collins's (1996) findings on the relationship-enhancing explanations that secure people make for a partner's negative behaviors and suggest that attachment security is related to forgiveness, a topic receiving attention in current research (e.g., McCullough, 2001).

The secondary attachment strategies of insecure individuals were evident in their reactions to trust-violation episodes (Mikulincer, 1998). Avoidant people increased their distance from partners following a betrayal of trust and dismissed the importance of this threatening occurrence. Anxious people, in contrast, worried and ruminated during a trust-betrayal episode, reacted to it with strong negative emotion, and attached high importance to it.

Interestingly, lexical decision times indicated that avoidant participants experienced activation of the word "worry" when primed with a trust-violation context. This discrepancy between, on the one hand, self-reports of distancing from the partner and not being bothered by betrayal and, on the other hand, experiencing an activation of "worry" may indicate the fragile nature of avoidant people's deactivating strategies. In fact, when responses to a trust-violation context were assessed without the mediation of deliberate, controlled processing, avoidant people exhibited a more anxious pattern of reaction, a result found in some of our other studies as well (e.g., Berant, Mikulincer, & Florian, 2001a, 2001b).

*Process of coping with stressful events.* The role of attachment strategies in coping with threats has been documented in a number of studies of a wide variety of stressful events – e.g., Iraqi Scud missile attacks on Israeli cities during the Gulf War (Mikulincer, Florian, & Weller, 1993), a demanding combat training exercise (Mikulincer & Florian, 1995), the process of divorce (Birnbaum, Orr, Mikulincer, & Florian, 1997), and the experience of chronic back pain (Mikulincer & Florian, 1998). These studies have also focused on the way women react to motherhood tasks, including first-time pregnancy (Mikulincer & Florian, 1999a), the birth of a first child (Mikulincer & Florian, 1998), and the birth of an infant who suffers from a congenital heart defect (CHD; Berant et al., 2001a, 2001b).

Findings concerning the appraisal of stressful events have revealed the core negative beliefs that are part of hyperactivating strategies as well as the optimistic beliefs associated with security-based strategies. Across the various stressors, anxiously attached people were found to appraise events in highly threatening terms and to hold the most serious doubts about their abilities and skills for dealing with them. In contrast, securely attached people reported the lowest levels of threat appraisal and the highest levels of perceived self-efficacy. With regard to avoidant persons, the findings are less consistent and seem to depend on contextual characteristics of the threat. For example, Berant et al. (2001a) found that avoidant mothers of either healthy infants or infants with a mild CHD held optimistic appraisals of motherhood tasks.

However, avoidant mothers of infants with a severe, life-threatening CHD appraised their plight as more threatening and viewed themselves as less able to deal with it than secure mothers.

With regard to participants' reports of coping strategies, the findings have consistently documented the expected procedural rules of attachment strategies. First, people with a secure style rely on two procedures referred to in the secure base script – support seeking and constructive attempts to solve the problem (problem-focused coping). Second, people with an anxious style score high on measures of emotion-focused coping, which is known to intensify rather than diminish the experience of distress. Third, people with an avoidant style score high on measures of distancing coping, which involves cognitive and behavioral withdrawal from the source of distress. These attachment-style differences are compatible with findings from other studies (e.g., Lussier, Sabourin, & Turgeon, 1997; Torquati & Vazsonyi, 1999).

Two additional studies provided further evidence concerning secure people's reliance on others' support for coping with threats. First, Florian, Mikulincer, and Bucholtz (1995) found that secure individuals (compared with anxious and avoidant individuals) have a stronger tendency to seek instrumental and emotional support in times of need from parents, close friends, and a romantic partner. This finding has been replicated in other laboratories (e.g., Larose, Bernier, Soucy, & Duchesne, 1999; Ognibene & Collins, 1998). Second, Mikulincer and Florian (1997) found that secure people were more likely than their insecure counterparts to benefit from supportive interactions while coping with stressors. Following an encounter with a distress-eliciting event (the anticipation of handling a snake), both an emotional conversation (talking about the emotions elicited by the snake) and an instrumental conversation (talking about how to deal with the snake task) were effective in restoring the emotional equanimity of secure persons. However, these techniques failed to improve the affective state of insecure persons. In fact, whereas an emotional conversation with a partner worsened avoidant individuals' affective state, an instrumental conversation worsened the state of anxious individuals.

It is important to note that characteristics of the stressful events affect attachment-style differences in coping strategies. For example, Berant et al. (2001a) found that the habitual

reliance of avoidant mothers on distancing coping was observed only when their infants were healthy or had a mild CHD. However, the reported frequency of this strategy was reduced when avoidant mothers had to face an infant's severe health condition. In such cases, these mothers, like anxious mothers, reported heightened reliance on emotion-focused coping. This finding implies that avoidant individuals' self-reliant façade seems to be sufficient when dealing with daily hassles or minor stressors. But when they encounter uncontrollable and persisting stressors, the facade may crumble, revealing a basic insecurity that favors ineffective coping techniques.

Berant et al (2001a) also found that whereas secure mothers of both healthy infants and infants with mild CHD relied on support-seeking strategies, secure mothers of infants having a severe CHD relied on both support seeking and distancing strategies. This finding implies that secure mothers can flexibly employ distancing coping whenever thoughts about the stressful condition can impair functioning. It is possible that the suppression of painful thoughts about the infant's severe CHD might have allowed them to maintain a positive appraisal of motherhood. As a result, the overwhelming demands of the infant's illness may not have discouraged secure mothers and they may have been able to mobilize internal and external resources for taking caring of a vulnerable baby.

Attachment-related strategies were also evident in the retrospective accounts of the experience of captivity of Israeli ex-prisoners (POWs) of the Yom Kippur War, assessed 18 years after the war (Solomon, Ginzburg, Mikulincer, Neria, & Ohry, 1998). A content analysis of these accounts revealed that securely attached ex-POWs reported having dealt with captivity by recruiting positive memories or creating positive imaginary encounters with significant others. That is, they coped with the threat by seeking symbolic proximity to, and comfort from, internalized attachment figures. In contrast, anxious persons mainly remembered suffering and pain, and their accounts were full of feelings of helplessness, abandonment, and loss of control, which corresponded to their hyperactivation of threat-related feelings. The narratives of avoidant ex-POWs were shaped by deactivating strategies – they were emotionally shallow and provided little information about emotional experiences during captivity.



*Rumination.* Two of our studies have documented the ruminative aspect of anxious individuals' hyperactivating strategies during manipulated failure experiences (Mikulincer & Florian, 1998; Kogot & Mikulincer, 2002). In these studies, participants performed cognitive tasks (e.g., concept learning, probability learning) and received either failure feedback or no feedback. They then reported on the frequency of task-related, ruminative worries experienced during the experiment. Across the two studies, the experience of failure led to more frequent bursts of task-related worries (compared with the no feedback condition) mainly for people who scored high on attachment anxiety. Kogot and Mikulincer (2002) also found that anxious individuals experienced more ruminative worries even after receiving no feedback. The mere demand to solve a cognitive problem triggered their hyperactivating strategies and caused them to ruminate and worry.

*Experience and management of death anxiety.* While examining the manifestations of attachment strategies in the process of coping with threats, we have devoted attention to the experience and management of the threat of death, something that must be confronted by all human beings with at least normal intelligence. One line of research examined attachment-style differences in the strength of death concerns, while assessing reports of overt fear of death (Florian & Mikulincer, 1998; Mikulincer, Florian, & Tolmacz, 1990), unconscious or preconscious expressions of this fear (responses to projective death-related TAT cards; Mikulincer et al., 1990), or the accessibility of death-related thoughts (the number of death-related words a person completed in Greenberg et al.'s, 1994, word completion task; Mikulincer & Florian, 2000, Study 2; Mikulincer, Florian Birnbaum, & Malishkowitz, 2002).

Overall, the findings reveal some of the procedural rules of hyperactivating and deactivating strategies. Anxious individuals were found to hyperactivate death concerns and keep death-related thoughts active in working memory. Specifically, attachment anxiety was associated with heightened fear of death at both conscious and unconscious levels as well as heightened accessibility of death-related thoughts even when no death reminder was present. Avoidant individuals' defensive attempts to suppress death-related thoughts were manifested in

dissociation between their conscious claims and unconscious dynamics. Whereas attachment avoidance was related to low levels self-reported fear of death, it was also related to heightened death-related anxiety on a projective TAT measure.

Attachment-style differences have also been found in the meanings people attribute to fear of death (Florian & Mikulincer, 1998; Mikulincer et al., 1990). Whereas attachment-anxious people tend to attribute this fear to the potential loss of social identity after death (e.g., “People will forget me”), avoidant people tend to attribute it to the unknown nature of the hereafter (e.g., “Uncertainty about what to expect”). In our view, these different meanings reflect the underlying action of attachment strategies. Anxious people hyperactivate worries about rejection and attachment-figure unavailability, viewing death as yet another relational setting in which they may be abandoned and forgotten. Avoidant deactivation of the attachment system and the consequent search for self-reliance leads to fear of the uncertain and unknown aspects of death that threaten a sense of control and mastery. That is, insecure people fear death for the same reasons they are distressed in attachment contexts (e.g., rejection, loss of control).

The second line of research examined attachment-style differences in the way people manage the “terror” (according to terror management theory; Greenberg et al., 1997) produced by experimentally presented reminders of death. People with a secure attachment style have been found to rely on two security-based strategies – constructive transformation of threats and the seeking of proximity. Mikulincer and Florian (2000, Study 4) reported that secure people reacted to mortality salience with heightened seeking of symbolic immortality – a transformational, constructive strategy that, while not solving the unsolvable problem of death, leads a person to invest in his or her children’s care and to engage in creative, growth-oriented activities whose products will live on after the person dies. That is, more secure individuals react to mortality salience by, for example, viewing procreation and parenting as important goals and by viewing their work and creative products as an important contribution to the human enterprise. Secure people have also been found to react to mortality salience with a heightened desire for intimacy

in close relationships (Mikulincer & Florian, 2000, Study 5) and heightened willingness to engage in social interactions (Taubman Ben-Ari, Findler, & Mikulincer, in press).

In contrast, people with an anxious or avoidant style did not exhibit an increase in the desire for proximity or symbolic immortality following death reminders (Mikulincer & Florian, 2000; Taubman Ben-Ari et al., in press). Rather, Mikulincer and Florian (2000, Study 1) found that insecure individuals reacted to a mortality salience induction with more severe judgments and punishments of moral transgressors. It seems that insecurely attached persons relied on what Greenberg et al. (1997) labeled “culturally derived defenses” – adherence to a cultural worldview and defensive enhancement of self-esteem. For anxious persons, adhering to a shared cultural worldview may be a way to gain greater love and acceptance from members of their group. For avoidant persons, the major issues may be self-reliance and control, which benefit from the defensive enhancement of self-esteem.

Integrating the entire set of findings, we see the following patterns. Secure individuals tend to rely on security-based strategies when dealing with death awareness, and these strategies seem to be highly effective in buffering death anxiety at both conscious and unconscious levels. Avoidant individuals tend to enhance their self-esteem in response to death reminders, which seems to be effective in buffering fear of death at a conscious level. However, this deactivating strategy seems to be ineffective in decreasing the unconscious fear of death and leaves a person concerned about death’s unknown and uncontrollable nature. Anxious individuals tend to bolster and express their cultural worldview as a symbolic defense against the death anxiety, in the hope of gaining greater love and acceptance. But their proclivity for attachment-system hyperactivation sets in motion processes such as rumination on death and separation that make adherence to cultural worldviews ineffective in buffering death anxiety.

*Management and cognitive processing of attachment-related threats.* We have also examined manifestations of attachment strategies in the management and cognitive processing of attachment-related threats (e.g., separation). In a field study, Fraley and Shaver (1998) obtained evidence for the underlying action of these strategies in the behavioral reactions of couple

members separating from each other in an airport. On the one hand, attachment avoidance was found to be associated with less frequent contact seeking and contact maintenance, and more frequent avoidance behavior (turning away, looking elsewhere). On the other hand, attachment anxiety was found to be associated with more intense non-verbal display of sadness and distress during the separation episode.

In two laboratory studies, Fraley and Shaver (1997) used a thought suppression paradigm to examine attachment-style differences in the ability to suppress separation-related thoughts. Participants wrote continuously about whatever thoughts and feelings they were experiencing while being asked to suppress thoughts about a romantic partner leaving them for someone else. In the first study, the ability to suppress these thoughts was assessed by the number of times separation-related thoughts appeared in participants' stream-of-consciousness writing following the suppression period. In the second study, this ability was assessed by the level of participants' physiological arousal (skin conductance level) during the suppression task – the lower the arousal, the higher the ability to suppress distress-eliciting thoughts about separation.

The findings reflected the operation of secondary attachment strategies in the processing of separation-related thoughts. Specifically, attachment avoidance was found to be associated with greater ability to suppress separation-related thoughts – indicated by less frequent thoughts following the suppression task and lower skin conductance during the suppression task. In contrast, attachment anxiety was associated with poorer ability to suppress separation-related thoughts – more frequent thoughts following the suppression task and higher skin conductance during the suppression task. This finding is a direct indication that anxious individuals cannot ignore or minimize separation-related concerns once these are made salient.

Two studies conducted by Fraley, Gardner, and Shaver (2000) further enrich our knowledge of the cognitive processes underlying avoidant individuals' deactivation of attachment-related threats. These investigators asked whether deactivating strategies act in a *preemptive* manner – e.g., by deployment of attention away from, and shallow encoding of, attachment-related threats – or *postemptive manner*: repression and forgetting of material that has

already been encoded. Participants listened to an interview about attachment-related threats and were later asked to recall details from the interview either immediately (Study 1) or at various delays ranging from half an hour to 21 days (Study 2). An analysis of forgetting curves over time revealed that (a) persons scoring high in attachment avoidance initially encoded less information about the interview than persons scoring low in this dimension, and (b) the two groups forgot the information they encoded at the same rate. These findings imply that avoidant persons' deactivating strategies at least sometimes act in a preemptive manner – holding distressing attachment-related material out of awareness and memory right from the start.

A recent series of three studies conducted by Mikulincer et al. (2002) documented an interesting procedural rule of anxious individuals' hyperactivating strategies in the processing of attachment-related threats. Across studies, participants were asked to imagine being separated from a loved partner (separation reminder) and then to perform a word completion task that tapped the accessibility of death-related thoughts. Findings indicated that people high on attachment anxiety reacted to separation reminders with heightened accessibility of death-related thoughts. When given partial words and asked to complete them, anxious individuals in a separation condition produced more death-related words. This tendency was particularly strong when the imagined separation was long-lasting or final (Study 3) or when it involved a romantic partner (Study 2). In other words, for anxious individuals, separation reminded them of death, which is very much in line with Bowlby's (1982/1969) original idea that the primary function of the attachment system is to protect a vulnerable person from death.

*Experience and management of anger.* In a series of three studies, Mikulincer (1998b) examined attachment-style differences in the way people experience and manage anger-eliciting relationship episodes. Specifically, these studies examined personal recollections of feelings, goals, and responses during the arousal of anger; reactions to hypothetical anger-eliciting scenarios differing in the intentions of a romantic partner (hostile, ambiguous, non-hostile); and expectations of the responses of a partner to one's expression of anger (e.g., he/she will accept me, he/she will leave me).

Across the three studies, secure persons' experience of anger corresponded with the declarative and procedural rules of security-based strategies. First, secure individuals held optimistic expectations of partner's responses during anger episodes and made well-differentiated, reality-attuned appraisals of partner's intentions during these episodes. They tended to attribute hostility to another person and to react to him or her with anger feelings only when there were clear contextual cues about a hostile intent. Second, secure persons' recollections of anger-eliciting episodes reflected functional, constructive attempts to rectify an undesirable relationship problem (what Bowlby, 1973, called the "anger of hope"). Specifically, secure persons tended to adopt constructive goals aimed at repairing the relationship with the instigator of anger, to engage in adaptive problem solving, to express anger outward in a controlled and non-hostile way, and to experience more positive than negative affect following anger episodes. (Incidentally, these findings are compatible with Gottman's, 1994, findings from marital communication research, which showed that anger per se is not a predictor of relationship malfunction or subsequent dissolution.)

Anxious people's anger experiences were quite different, and fit with the declarative and procedural knowledge associated with hyperactivating strategies. First, anxious individuals held negative expectations of partner's responses during anger episodes and tended to make undifferentiated, negatively-biased appraisals of partner's intentions. They attributed hostility to their partner and reacted to him or her with angry feelings even when there were ambiguous cues about hostile intent. Second, anxious persons' recollections of anger episodes reflected hyperactivation of distress, which overwhelmed their cognitive system and drew resources away from adaptive coping. Specifically, anxious individuals reported higher proneness to anger, experienced uncontrollable access to anger feelings, ruminated excessively on these feelings, and experienced more negative than positive affect following anger episodes.

Avoidant people's deactivating strategies seemed to produce what Mikulincer (1998b) called "dissociated anger." Although these individuals did not report intense anger, they reported heightened hostility and exhibited intense physiological signs of arousal during anger episodes,

and displayed an undifferentiated tendency to attribute hostility to a partner even when there were clear contextual cues about a partner's non-hostile intent. This disassociated stance was also manifested in avoidant individuals' high scores on a measure of escapist methods for dealing with anger. This pattern of findings fits Rholes, Simpson, and Orina's (1999) observations that people scoring high on attachment avoidance displayed especially hostile behavioral responses toward a distressed romantic partner in a laboratory threat context.

*Cognitive consequences of negative affect.* In two experiments, Pereg and Mikulincer (2002) documented the involvement of attachment-related strategies in shaping the cognitive consequences of negative affect. In both studies, participants were randomly assigned to a negative affect condition (reading an article about a car accident) or a neutral affect condition (reading about how to construct something using a hobby kit). Following this affect induction, incidental recall or causal attributions were assessed. In the first study, participants read a booklet with positive and negative headlines, and then, without prior warning, were asked to recall as many of the headlines as possible. In the second study, participants were asked to list the causes of a hypothetical negative relationship event ("your partner disclosed something you asked him to keep secret").

The "building" feature of security-based strategies was manifested in a mood-incongruent pattern of cognition. Induced negative affect, as compared with a neutral condition, led participants who scored low on both attachment anxiety and avoidance to recall more positive headlines and fewer negative headlines and to attribute a negative event to less global and stable causes. Such security-based strategies are likely to inhibit the spread of negative affect throughout the working memory and to activate competing positive cognitions (positive headlines, attributions that maintain a positive view of one's partner). These cognitions work against the pervasive effects of negative affect and facilitate mood repair.

Anxious, hyperactivating strategies were manifested in mood-congruent cognitions. Induced negative affect, as compared with a neutral condition, led participants who scored high on attachment anxiety to recall fewer positive headlines and more negative headlines and to

attribute a negative event to more global and stable causes. Hyperactivating strategies favor the spread of negative affect throughout the working memory and facilitate the processing of congruent negative cognitions (negative headlines, attributions that elicit doubts about one's partner). These negative cognitions can exacerbate negative mood and contribute to continued activation of the attachment system.

Avoidant persons' deactivating strategies weakened the links between negative affect and cognitions. People who scored high on avoidance showed no notable effect of induced negative affect on recall or causal attributions. Deactivating strategies seem to block the acknowledgment of negative affect and prevent the use of inner-state information in cognitive processing, thereby weakening the power of negative affect to influence cognitions. In this way, deactivating strategies distance people from their own emotional world and facilitate the goal of attachment-system deactivation.

*Cognitive activation and architecture of emotional memories.* Mikulincer and Orbach (1995) examined the procedural rules of attachment strategies that organize threat-related material within the associative memory network. Participants were asked to recall early experiences in which they felt anger, sadness, anxiety, or happiness, and the time for retrieving a memory was taken as a measure of cognitive accessibility. Participants also rated the intensity of dominant and non-dominant emotions in each recalled event.

In the memory task, people with an avoidant style exhibited the lowest accessibility (highest recall time) of memories of sadness and anxiety, people with an anxious style showed the greatest access to these painful memories, and people with a secure style fell in between. Furthermore, whereas secure individuals took more time to retrieve negative emotional memories than a happiness memory, anxious people took more time to retrieve a happiness memory than negative emotional memories. In the emotion-rating task, avoidant individuals rated dominant emotions (e.g., sadness when retrieving a sad memory) and non-dominant emotions (e.g., anger when retrieving a sad memory) as less intense than secure individuals, whereas anxious individuals reported experiencing very intense dominant and non-dominant



emotions in the anxiety, sadness, and anger memories. Interestingly, secure persons rated dominant emotions as far more intense than non-dominant emotions.

The findings provided strong support for the functional nature of security-based strategies. Secure individuals tended to acknowledge distress, have access to negative memories, and exhibit well-elaborated processing of these experiences. However, they still had better access to positive memories and tended to control the spread of negative emotions to other non-dominant negative emotions. In this way, they maintained a positive cognitive context and possessed a well-differentiated emotional architecture, which probably allows them to process negative memories without being overwhelmed by distress and confounded by other negative emotions.

The findings also documented the deactivating and hyperactivating strategies of insecure people. Avoidant individuals showed reduced access to negative emotional memories, and those that were recalled were psychologically shallow. In contrast, anxious individuals showed fast access to negative emotional memories and impaired control of the spread of activation from one memory with a particular negative tone to other, different negative emotions. These findings fit with our theoretical portrayal of anxious people as having an undifferentiated, chaotic emotional architecture, which makes emergence from negative emotional spirals particularly difficult.

#### *Studies on the Implications of Attachment Strategies for Self-Appraisals*

A number of our studies have documented the negative implications of anxious persons' hyperactivating strategies for self-appraisals. Attachment anxiety has been associated with lower scores on the Rosenberg self-esteem scale (Brennan & Shaver, 1992; Cooper, Shaver, & Collins, 1998; Mickelson, Kessler & Shaver, 1998; Shaver, Papalia, Clark, & Koski, 1996; Taubman Ben-Ari et al., in press) and the endorsement and incidental recall of more negative self-relevant traits (Mikulincer, 1995). These findings are compatible with those reported in other studies (e.g., Bartholomew & Horowitz, 1991; Brennan & Morris, 1997; Griffin & Bartholomew, 1994).

In a further effort to examine the implications of attachment strategies for self-appraisals, Mikulincer (1995) measured the accessibility of positive and negative self-relevant traits in a

Stroop Task, the pervasiveness of affect in a task that involved sorting self-relevant traits, the level of differentiation between self-aspects in the same task, the level of integration between differentiated self-aspects, and the strength of discrepancies between self-domains and self-standpoints as assessed by Higgins, Bond, Klein, and Strauman's (1986) procedure. The findings revealed that secure individuals have ready access to both positive and negative self-attributes, possess a highly differentiated and integrated self-organization, and have relatively small discrepancies between domains and standpoints of the self. Their constructive security-based strategies seem to create a balanced, coherent, and well-organized self-view. This strategy highlights positive self-representations, consolidates boundaries between self-aspects that resist the automatic spread of negative affect, and encourage people to tolerate weak points of the self and to integrate them within the self-structure.

The findings were also in line with our ideas about the cognitive operations of secondary attachment strategies. On the one hand, anxious persons were found to have access only to negative self-attributes, scored low in the differentiation and integration of self-attributes, and revealed a pervasiveness of negative affect in the sorting of these attributes. On the other hand, avoidant persons had poor access to negative self-attributes and exhibited low integration between these attributes and other self-aspects.

Interestingly, both anxious and avoidant individuals had relatively large discrepancies between their self-image and self-standards (ideal-self, ought self). However, whereas anxious persons' discrepancies resulted from their negative self-image, avoidant persons' discrepancies resulted from high, unrealistic self-standards. It seems that avoidant people's pursuit of a perfect and powerful self creates demanding self-standards that are discrepant even from their defensively positive self-view. This interpretation fits with results showing positive associations between attachment avoidance and traits of perfectionism and self-criticism (e.g., Rice & Mirzadeh, 2000; Zuroff & Fitzpatrick, 1995).

In a series of four experimental studies, Mikulincer (1998c) provided systematic evidence that secondary attachment strategies bias self-appraisals (self-inflation, self-devaluation) as a

means of dealing with threats. Participants were exposed to various experimentally induced threatening or neutral situations, and appraisals of self were measured with self-report scales and other subtler cognitive techniques, such as reaction times for trait recognition. Avoidant individuals' deactivating strategies led them to react to threats with suppression of negative self-attributes and self-inflation. They made more explicit and implicit positive self-appraisals following threatening than neutral stimuli. In contrast, anxious individuals' hyperactivating strategies led them to react to threats with a more intense focus on negative self-attributes and self-devaluation. They made more explicit and implicit negative self-appraisals following threatening than neutral conditions. Secure people showed no notable bias in their self-appraisals. It seems that their sense of attachment security maintains a positive, stable self-image during the encounter with threats and renders unnecessary any defensive bias in self-appraisals.

Mikulincer (1998c, Studies 3-4) also provided empirical support for our ideas that (a) avoidant people's self-inflation bias is intended to convince other people of the strength and efficaciousness of the avoidant self, and (b) anxious people's self-devaluation bias is intended to elicit others' compassion and love. Specifically, findings revealed that avoidant individuals' tendency to endorse a more positive self-view in threatening than in neutral contexts was inhibited by a message that broke the link between a positive self-view and self-reliance. The findings also revealed that anxious individuals' tendency to endorse a less positive self-view in threatening than in neutral contexts was inhibited by a message that broke the link between self-devaluation and others' positive responses.

Insecure people's defensively biased self-appraisals were also documented in a recent study by Kogot and Mikulincer (2002), which examined causal attribution of failure in achievement settings. In this study, anxious persons' hyperactivating strategies led them to make what Abramson, Metalsky, and Alloy (1989) called a "hopelessness-depressive" pattern of attributions. Failure was attributed to more internal, stable, global, and uncontrollable causes, which, in turn, reinforced a negative view of the self. In contrast, avoidant persons' deactivating strategies led them to make defensive, self-enhancing causal attributions. They attributed failure

to less internal causes, dismissed the diagnosticity of the failure, and blamed others for it. These results fit findings reported in other studies (e.g., Kennedy, 1999; Man & Hamid, 1998).

*Studies on the Implications of Attachment Strategies for Person Perception*

Some of our studies have documented the negative implications of secondary attachment strategies for person perception. Specifically, insecurely attached people have been found to describe relationship partners, such as parents, romantic partners, friends, and members of a group, in more negative terms than people who report having a secure style (Hazan & Shaver, 1987; Levy, Blatt, & Shaver, 1998; Mikulincer & Erev, 1990; Mikulincer & Arad, 1999; Rom & Mikulincer, 2002). These findings were consistent with those reported by other researchers (e.g., Bartholomew & Horowitz, 1991; Collins, 1996; Collins & Read, 1990).

In a series of six studies, Mikulincer, Orbach, and Iavnieli (1998) also provided evidence on the biases produced by secondary attachment strategies in perception of others – namely, hyperactivating strategies' overemphasis on self-other similarities and consensus, deactivating strategies' overemphasis on self-other dissimilarities and self-uniqueness. Specifically, Mikulincer et al. (1998) found that anxious people were more likely than secure people to perceive others as similar to them and to show a false consensus bias in both trait and opinion descriptions. In contrast, avoidant individuals were more likely than secure people to perceive others as dissimilar to them and to exhibit a false distinctiveness bias. Mikulincer et al. (1998) also found that anxious individuals reacted to threats by generating a self-description that was more similar to a partner's description and by recalling more partner traits that were shared by themselves and the partner. In contrast, avoidant persons reacted to the same threats by generating a self-description that was more dissimilar to a partner's description and by forgetting more traits that were shared by themselves and the partner. Interestingly, secure individuals' self-descriptions and recall of partners' traits were not affected by the encounter with threats.

Following up these experiments, Mikulincer and Horesh (1999) examined the projective mechanisms that might underlie insecure people's perceptions of others. Specifically, they examined (a) avoidant individuals' tendency to defensively project unwanted traits of the self

onto others, which increase self-other differentiation and, by comparison, enhance their sense of self-worth, and (b) anxious individuals' tendency to project their actual-self traits onto others, which increases self-other similarity and the sense of closeness. These tendencies were examined in three two-session studies. In the first session, participants generated actual-self traits and unwanted-self traits. The second session was devoted to assessing impressions of hypothetical people, ease of retrieving memories of actual familiar people, and inferences about the learned features of hypothetical people. In each study, Mikulincer and Horesh (1999) examined the extent to which these cognitive processes were biased by participants' self-views.

The findings indeed revealed that avoidant individuals projected unwanted self-traits onto others. They were in fact likely to perceive in others the traits included in their own unwanted self, easily retrieve an example of a known person whose traits resembled those of their unwanted self, and make faulty inferences that traits taken from their unwanted self were among the features they learned about a target person whose description resembled their unwanted-self traits. It seems that avoidant individuals' attempts to defensively exclude negative information about the self and to maintain interpersonal distance dominate their perceptions of others.

The findings also provided clear-cut evidence that anxious individuals tend to project traits of their actual self onto others. They were likely to perceive in an unknown person traits that defined their actual self, easily retrieve an example of a known person whose traits resembled their actual-self traits, and make faulty inferences that traits taken from their actual self were found among features they learned about a target person whose description resembled their actual-self traits. It seems that their intense search for connectedness dominates anxious individuals' perception of others.

Importantly, Mikulincer and Horesh (1999) found that secure persons' representations of others seemed to be unbiased by projective mechanisms. That is, persons who reported having a secure attachment style were less prone than insecure persons to project onto others features that defined their self or that they denied having. The constructive nature of security-based strategies may allow secure people to tolerate ambiguities and contradictions in their self-view as well as in

their relationships with others, thereby reducing the threats elicited by unwanted self-aspects or by self-other discrepancies and the resulting need for psychological projection.

In a recent series of five studies, Mikulincer and Shaver (2001) provided further evidence for the association between security-based strategies and a reduction of biases in representations of others. Specifically, these studies showed that security-based strategies reduce negative biases in responding to people who are different from oneself or who do not belong to one's own social group (out-group members). First, the findings indicated that the higher a person's sense of chronic attachment security, the weaker his or her hostile responses to a variety of outgroups (as defined by secular Israeli Jewish students): Israeli Arabs, Ultra-orthodox Jews, Russian immigrants, and homosexuals. Second, different experimental priming techniques—subliminal presentation of security-related words such as love and proximity; guided imagery concerning the components of the secure base script; and visualization of the faces of security-enhancing attachment figures – that momentarily heightened the sense of attachment security were found to eliminate hostile responses to these outgroups. These effects were mediated by threat appraisal and were found even when participants were led to believe they had failed on a cognitive task or their national group had been insulted by an outgroup member. That is, a sense of attachment security reduced the threats elicited by the encounter with outgroup members and rendered unnecessary any derogative or hostile response toward them.

#### *Studies on the Affective and Adjustment Implications of Attachment Strategies*

In this section, we review our research findings on the implications of attachment strategies for a person's affective state. We divide this section into two subsections. First, we review studies that have focused mainly on a person's transient mood and affective responses to specific events. Second, we present findings on attachment-style differences on more global and chronic measures of mental health, and emotional and adjustment problems.

*Mood and affective responses.* Our studies provide empirical support for the positive contribution of security-based strategies to a person's transient affective state. Some of our studies document associations between the sense of attachment security and mood reports.

Different priming techniques (e.g., subliminal presentation of security-related words, guided imagery concerning the components of the secure base script, visualization of the faces of security-enhancing attachment figures) that momentarily heighten the sense of attachment security were found to improve participants' mood reports during the experimental session (Mikulincer, Gillath, et al., 2001; Mikulincer, Gillath, et al., in press; Mikulincer & Shaver, 2001). In addition, some of these priming techniques tend to infuse even formerly neutral stimuli with positive affect without the intervention of participants' awareness. In a series of six experiments, Mikulincer, Hirschberger, et al. (2001) reported that the subliminal presentation of security-related pictures or the names of persons who were nominated by participants as security-enhancing attachment figures in the WHOTO scale led to higher liking ratings of unknown Chinese ideographs than the subliminal presentation of neutral stimuli.

Mikulincer, Hirschberger, et al. (2001) also reported that subliminal activation of the sense of attachment security led to more positive evaluations of neutral stimuli even in threat contexts and eliminated the detrimental effects that these contexts generally had on the liking of neutral stimuli. That is, whereas threat contexts lowered the liking of the ideographs, attachment-security representations counteracted this negative effect and maintained a heightened positive evaluation in these circumstances. This finding indicates the protective effect of internalized representations of attachment security.

Our studies have also documented the detrimental effects of anxious persons' hyperactivating strategies on their mood and affective responses to social interactions. Several studies have reported that the higher a person's attachment anxiety, the more negative his or her mood during experimental sessions (e.g., Mikulincer & Florian, 1997; Mikulincer, Gillath, et al., 2001; Mikulincer, Gillath, et al., in press; Mikulincer & Shaver, 2001). In a diary study in which participants completed the Rochester Interaction Record every time they had a social interaction that lasted 10 min or longer for one week, Tidwell, Reis, and Shaver (1996) found that attachment anxiety was associated with more negative affect during the reported interactions. This effect was replicated in opposite-sex partner interactions, same-sex partner interactions, and

group interactions. Similarly, Rom and Mikulincer (2002) found attachment anxiety to be associated with the report of more intense negative emotions toward task-oriented groups.

Some recent studies also provide initial evidence concerning the emotional detachment produced by avoidant persons' deactivating strategies. For example, Rom and Mikulincer (2002) found that attachment avoidance was associated with less intense positive feelings toward task-oriented groups. In a diary study of marital interactions, Mikulincer, Florian, and Hirschberger (2002) found that attachment avoidance was associated with daily reports of less intense emotional responses, either negative or positive, toward a spouse. Similar findings have been reported in other studies (e.g., Pietromonaco & Feldman Barrett, 1997).

*Mental health and adjustment.* Our research program provides important information about the implications of attachment strategies for mental health and adjustment. Data have been collected with global measures of psychological well-being and distress as well as more specific measures of emotional problems (depression, anxiety, hostility, loneliness), adjustment problems (eating disorders, substance abuse, conduct disorders), and personality disorders.

In a series of studies (Berant et al., 2001a, 2001b; Birnbaum et al., 1997; Mikulincer & Florian, 1998, 1999a; Mikulincer, Horesh, Levy-Shiff, Manovich, & Shalev, 1998), we have examined the association between attachment style and global scores of psychological well-being and distress on the Mental Health Inventory (Veit & Ware, 1983). Without exception, all of these studies have shown that secure attachment is positively related to well-being and inversely related to distress. In contrast, anxious attachment is inversely associated with well-being and positively associated with distress. These associations have been found both in community samples and in samples of people who were experiencing stressful events. They have also been found in both cross-sectional and prospective longitudinal designs.

In all of these studies, avoidant attachment seems to have differential associations with mental health, depending on the presence of stressful circumstances. In community samples, weak associations have been found between attachment avoidance and mental health. However, in stressful circumstances, attachment avoidance has been strongly associated with poor mental



health. For example, Berant et al. (2001b) reported that attachment avoidance of mothers of infants with CHD (measured immediately following the CHD diagnosis) was more strongly related to distress (measured one year later) than was attachment anxiety.

These studies provide strong evidence for the distress-buffering effects of security-based strategies. Specifically, the encounter with stressful events has been found to heighten distress mainly among insecurely attached persons, but not among people who report a secure style. For these people, no notable difference in mental health has been found between neutral and stressful conditions. In addition, two of these studies provide support for the hypothesis that attachment-style differences in mental health result from the underlying action of attachment strategies (Birnbaum et al., 1997; Berant et al., 2001a). Structural analyses have shown that the association between secure attachment and mental health was explained by secure persons' high appraisal of their ability to cope with stress and their reliance on support seeking. The association between attachment anxiety and distress was explained by anxious persons' exaggerated threat appraisal and heightened reliance on emotion-focused coping. Finally, the association between avoidance and distress was explained by avoidant persons' heightened reliance on distancing coping.

Strong associations have also been found between reports of attachment style and reports of specific emotional problems. In both American and Israeli samples, symptoms of depression, anxiety, and hostility were inversely associated with the secure attachment style and positively associated with anxious and avoidant styles (Cooper et al., 1998; Mikulincer et al., 1993; Mikulincer, Horesh, Eilati, & Kotler, 1999; Mickelson et al., 1997). In addition, Hazan and Shaver (1987) and Kirkpatrick and Shaver (1991, 1992) reported that people who endorsed an avoidant or anxious style in romantic relationships or in their relationship with God reported higher levels of loneliness than people who endorsed a secure style. These attachment-style differences in emotional problems have been replicated in several studies (e.g., Carnelley, Pietromonaco, & Jaffe, 1994; Roberts, Gotlib, & Kassel, 1996).

Although both anxious and avoidant people suffer from emotional problems, their reliance on hyperactivating or deactivating strategies results in different patterns of problems.

For example, we have found that attachment anxiety but not attachment avoidance is related to measures of trait anxiety and neuroticism (Mikulincer et al., in press; Mikulincer & Sheffi, 2001; Mickelson et al., 1997; Shaver & Brennan, 1992; Shaver et al., 1996). These two measures reflect heightened worries and the experience of emotional extremes and instability – core accompaniments of anxious persons' hyperactivating strategies. In addition, Mikulincer et al. (1993) reported that anxious persons' hyperactivating strategies led them to react to stressful events with heightened depression, anxiety, hostility, somatization, and intrusive post-traumatic symptoms. In contrast, avoidant persons' deactivating strategies led them to react to stressful events with heightened hostility, somatic complaints, and avoidant post-traumatic symptoms.

With regard to adjustment problems, Brennan and Shaver (1995) found that both attachment anxiety and attachment avoidance were positively associated with measures of eating disorders, drinking behavior, and the use of drinking as a maladaptive means for handling distress. Furthermore, Mickelson et al. (1997) reported that both attachment anxiety and attachment avoidance were positively associated with measures of psychoactive substance use and conduct disorders. These findings were replicated by Cooper et al. (1998), who presented interesting evidence concerning the involvement of secondary attachment strategies in mediating the association between insecure attachment and maladaptive behaviors. Anxious persons' maladaptive behaviors were mainly explained by hyperactivation of negative feelings of depression and hostility. Avoidant persons' maladaptive behaviors were better explained by deactivating strategies that inhibit their involvement in social interactions and close relationships and impoverish their social competences and skills.

These secondary attachment strategies have also been associated systematically with specific personality disorders. Brennan and Shaver (1998) reported that attachment avoidance was positively associated with the schizoid personality disorder. This disorder reflects a person's tendency to retreat from others and avoid close relationships – a pathological result of avoidant persons' deactivation of the attachment system. Brennan and Shaver (1998) also found that attachment anxiety was positively associated with dependent and histrionic personality disorders.

The dependent disorder reflects a strong need to rely on others and the histrionic disorder reflects a tendency to exaggerate actions and emotions to attain attention from others. Both pathological tendencies seem to derive from anxious persons' search for comfort, attention, and security.

*Studies on the Implications of Attachment Strategies for Relationship Quality*

The hypothesized positive association between the sense of attachment security and relationship satisfaction has been consistently documented in several of our studies (Brennan & Shaver, 1995; Hazan & Shaver, 1987, 1990; Mikulincer & Erev, 1991; Mikulincer & Florian, 1999b; Mikulincer, Horesh, et al., 1998; Shaver & Brennan, 1992). These studies have focused on both dating and marital relationships and have used different self-report measures of relationship satisfaction (e.g., Relationship Rating Form, Dyadic Adjustment Scale). All of these studies have found that people who endorse a secure style report the highest level of relationship satisfaction and anxiously attached persons report the lowest level. This association was found in both men and women and has been replicated in a prospective longitudinal design (Shaver & Brennan, 1992). Importantly, Shaver and Brennan (1992) reported that the association between secure attachment and relationship satisfaction cannot be explained by other personality factors, such as the "big five" factors (McCrae & Costa, 1990). These attachment-style differences in relationship satisfaction have been replicated in dozens of other studies around the world (see Feeney, 1999; Koski & Shaver, 1997; and Mikulincer, Florian, Cowan, & Cowan, in press, for extensive reviews of these studies).

The sense of attachment security has also been found to contribute to other aspects of relationship quality. For example, positive associations have been found between reports of secure attachment and measures of involvement and interdependence in dating relationships (Hazan & Shaver, 1987; Mikulincer & Erev, 1991). Ratings of attachment security were significantly associated with greater commitment to a dating relationship (Mikulincer & Erev, 1991; Morgan & Shaver, 1999; Shaver & Brennan, 1992). Again, these findings have been replicated in several other studies (e.g., Bartholomew & Horowitz, 1991; Collins & Read, 1990; Levy & Davis, 1988).

In a study of family dynamics, Mikulincer and Florian (1999b) found significant associations between spouses' attachment style and their reports of marital cohesion and flexibility (FACES III). Whereas spouses with a secure style reported relatively high family cohesion and flexibility, avoidant spouses scored relatively low on these two dimensions, and anxious spouses reported high family cohesion but low family flexibility. These associations generally reflect the underlying action of attachment strategies. Secure persons' construction of intimate relationships and the flexibility of their affective-cognitive organization were directly manifested in high levels of marital cohesion and adaptability. Avoidant persons' construction of non-cohesive and rigid relationships seems to result from their deactivating tendency to avoid both intimate interactions and flexible and open confrontation with environmental demands. The findings for anxious persons (high cohesion, low flexibility) seem to result from their compulsive search for closeness, intimacy, and connectedness.

Attachment strategies have also been found to shape the quality of daily social interactions. In their diary study, Tidwell et al. (1996) asked participants to rate the intimacy, pleasure, and satisfaction they felt during social interactions. Results showed that secure participants reported more intimacy, pleasure, and satisfaction in daily interactions with opposite-sex partners than avoidant participants. Moreover, secure participants interacted more often and for longer periods of time per partner with members of the opposite sex. Conceptually similar findings were reported by Rom and Mikulincer (2002). Participants were asked to recall task-oriented group interactions and to evaluate the quality of these interactions. Findings revealed that both attachment anxiety and attachment avoidance were significantly associated with the recall of more negative memories of group interactions.

#### *Studies on the Interplay between the Attachment System and Other Behavioral Systems*

*Exploration system.* Our research program offers clear-cut evidence for the hypothesized effects of the sense of attachment security on the activation of the exploration system. These effects have been documented on people's attitudes toward work, proneness to curiosity and information search, and openness of the cognitive system to new information and changes in

existing knowledge structures (cognitive openness). These effects were also illustrated in the loosening of cognitive operations and the exploration of new, unusual associations in conditions that favored a relaxed activation of the exploration system (i.e., induced positive affect).

Hazan and Shaver (1990) proposed that work serves as one form of exploration in adulthood and found that secure individuals reported more positive attitudes toward work and were more satisfied with work activities than avoidant or anxious persons. Interestingly, these attitudes were found to be organized around the main goals of attachment strategies. The constructive goal of security-based strategies was directly manifested in secure persons' perception of work as an opportunity for learning and advancement. In contrast, anxious individuals perceived work as an additional opportunity for social acceptance and approval – the main goal of their hyperactivating strategies. Avoidant individuals perceived work as an opportunity for evading close relationships – the main goal of their deactivating strategies.

In a series of five studies, Mikulincer (1997) presented convincing evidence that attachment security facilitates cognitive exploration and openness to new information. First, secure persons reported more curiosity-proneness than insecure persons. Similar findings were reported by Green and Campbell (2000) and Green-Hennessy and Reis (1999). Second, secure people scored lower on measures of cognitive closure, intolerance of ambiguity, and dogmatic thinking than insecure people. Third, secure people were less likely than their insecure counterparts to make judgments about a target person on the basis of early information and to ignore later data (primacy effect). Fourth, secure people were less likely than insecure people to make stereotype-based judgments. Specifically, insecure individuals evaluated the quality of an essay based on the supposed ethnicity of the writer rather than on exploration of the quality of the written essay: The more positive the stereotype of the writer's ethnic group, the higher the grade assigned to the essay. In contrast, secure people were less affected by ethnic stereotypes.

These attachment-style differences in cognitive openness were also examined by Mikulincer and Arad (1999), who focused on the revision of knowledge about a relationship partner following behavior on the part of the partner that seemed inconsistent with this

knowledge. Compared to secure persons, both anxious and avoidant individuals displayed fewer changes in their baseline perception of the partner after being exposed to expectation-incongruent information about the partner's behavior. They were also less able to recall the information. This finding was replicated when relationship-specific attachment orientations were assessed: The higher the attachment anxiety or avoidance toward a specific partner, the fewer the revisions people made in their perception of this partner upon receiving expectation-incongruent information (Mikulincer & Arad, 1999). Moreover, contextual heightening of the sense of attachment security (visualizing a supportive other) increased cognitive openness and led people to revise their conception of a partner based on new evidence (Mikulincer & Arad, 1999).

In a series of three experiments, Mikulincer and Sheffi (2000) reported that attachment-style differences in cognitive openness can be observed even in contexts that facilitate relaxed exploration, such as subsequent to the arousal of positive affect. Participants were exposed to positive affect inductions (asking them to retrieve a happy memory or exposing them to a brief comedy film) or neutral affect conditions and their creative problem solving performance and the breadth of their mental categorization were assessed. The typical beneficial effects of positive affect induction on creative problem solving and category breadth (reported by Isen & Daubman, 1984, and Isen, Daubman, & Nowicki, 1987) were observed only among people with a secure attachment style. For avoidant persons, no significant difference was found between positive-affect induction and neutral conditions. For anxious persons, a reverse effect was found which resembled the typical effects of negative affect induction. Specifically, these people reacted to a positive affect induction with impaired creativity and a narrowing of mental categories.

The observed reactions of secure individuals follow from their attention to affective cues. According to Schwartz and Bohner (1996), the induction of positive affect signals that "all is going well." Secure people's openness to affective cues leads naturally to considering this signal to be a relevant input for cognitive processing, and then to "loosening" their cognitive strategies and exploring unusual associations. These reactions are reflections of secure individuals'

confidence that letting down their guard is not dangerous and that they can deal effectively with uncertainty, novelty, and any confusion that the broadening of knowledge might create.

The findings for avoidant individuals are compatible with their cognitive reactions to negative affect (Pereg & Mikulincer, 2002) and may result from their defensive exclusion of affective material. Whereas dismissal of negative affect is necessary to prevent attachment-system activation, dismissal of positive affect may be necessary to prevent a loosening of cognitive strategies that can result in uncertainty and confusion, which may bring about an unwanted re-activation of the attachment system.

The findings for anxious people reveal the extent of their undifferentiated hyperactivation of negative cognitions. For them, apparently, the spread of activation across negative cognitions can begin even with positive affect. Perhaps they at first experience a positive state, but then become reminded of the down side of previous experiences that began positively and ended painfully. Once attuned to these negative memories, the anxious mind may suffer from a spread of negative associations that interferes with exploration and open information processing. Even in an experimental condition intended to induce positive affect, the hyperactivating strategies of anxious individuals prevent them from feeling safe and engaging in relaxed exploration.

*Caregiving system.* Our research also provides empirical support for the facilitatory effects of the sense of attachment security on the activation of the caregiving system – the system that drives us to provide protection and support to others who are either chronically dependent or temporarily in need (Bowlby, 1982/1969). These effects have been documented on a person's attitudes toward caregiving in close relationships, the arousal of altruistic empathy during the encounter with others' needs, and the endorsement of prosocial, other-focused values.

Kunce and Shaver (1994) constructed a self-report questionnaire to assess caregiving behaviors in close relationships and found that secure people were more sensitive to partners' needs, reported more cooperative caregiving, and described themselves as more likely to provide emotional support than insecure persons. Moreover, whereas avoidant people's deactivating strategies led them to maintain distance from a needy partner (less accessibility, less physical

contact), anxious people's hyperactivating strategies led them to report high levels of overinvolvement with partner's problems and a pattern of compulsive caregiving (e.g., expressing fears that their partner would leave if they didn't take care of him or her). These findings have been replicated using other self-report scales and behavioral observations (e.g., Carnelley, Pietromonaco, & Jaffe, 1996; Collins & Feeney, 2000).

In a series of five experiments, Mikulincer, Gillath, et al. (2001) documented the facilitatory effects of attachment security on a person's empathic, compassionate responses to others' needs. First, both attachment anxiety and avoidance were associated with low levels of altruistic empathy. Second, the contextual heightening of the sense of attachment security (asking participants to recollect personal memories, read a story, or watch a picture of supportive others or subliminally exposing them to proximity-related words) increased reports of altruistic empathy. In contrast, the contextual activation of attachment anxiety or avoidance (asking participants to recall personal memories of relational episodes in which they felt attachment anxiety or avoidance) reduced this prosocial attitude. Importantly, these effects were not explained by mood variations and did not depend on relationship closeness.

The findings also revealed that attachment anxiety but not attachment avoidance was associated with more intense personal distress responses during the encounter with others' needs. This finding implies that avoidant people's deactivating strategies led them to be emotionally detached while witnessing other's plight – they react to this situation with neither empathy nor personal distress. In contrast, anxious persons become emotionally overwhelmed while witnessing another's plight. This self-focused reaction is in line with anxious persons' hyperactivating strategies and may inhibit empathy and caregiving reactions. While witnessing the plight of another person, anxiously attached individuals are so overwhelmed with self-related negative cognitions and emotions that they are not able to offer assistance and comfort to the needy person.

There is also evidence that attachment security facilitates the development of a prosocial orientation. Across three independent studies, Mikulincer, Gillath, et al. (in press) reported that



attachment avoidance was associated with low endorsement of values of universalism (concern for the welfare of all people) and benevolence (concern for the welfare of close persons).

Moreover, contextual heightening of the sense of attachment security (asking participants to recall personal memories or watch a pictorial representation of supportive others) increased the endorsement of these values. These effects were not explained by induced or reported mood.

*Sexual system.* The sexual behavior system, along with attachment and caregiving, is a central component of romantic love (Shaver et al., 1988). From an evolutionary perspective, the major function of romantic attraction and sexual mating is to reproduce the mates' genes. From a more proximal perspective, the quality of a couple's sex life is an important contributor to relationship satisfaction – one that research shows is affected by attachment security.

Our research program offers empirical evidence supporting the beneficial effects of attachment security in the functioning of the sexual system. In a recent study of adolescent sexuality, Tracy, Shaver, Albino, and Cooper (in press) found that adolescents who endorsed a secure style were open to mutually satisfying sexual exploration in the context of a stable relationship and said they engaged in sex primarily to show love for their partner. Tracy et al. (in press) also reported that if both partners were secure, initiation of sexual activity was mutual and physical closeness was enjoyed. In a study of adults' experiences of heterosexual intercourse, Birnbaum, Gillath, and Mikulincer (2002) found that attachment insecurity contributed to the construction of sexual experience in negative and aversive terms. Specifically, both attachment anxiety and attachment avoidance were associated with higher scores on subscales tapping the experience of negative feelings and worries during heterosexual intercourse (e.g., sense of estrangement, sin feelings, sense of sexual inadequacy).

We also have initial evidence for the involvement of secondary attachment strategies in shaping the sexual attitudes, experiences, and behaviors of insecurely attached people. With regard to avoidant persons, Birnbaum et al. (2002) found that avoidant individuals tended to remain emotionally detached even during heterosexual intercourse; they scored relatively low on subscales tapping the experience of pleasure-related feelings, orgasmic experiences, and feelings

of love toward their partner during sexual activity. In the analysis of reasons adolescents give for having sex, Tracy et al. (in press) found that avoidant adolescents gave more self-defining or self-enhancing reasons, such as losing their virginity, than relationship-focused reasons.

Avoidant individuals' attempts to deactivate their attachment system are also reflected in the fact that they are more likely than anxious or secure people to approve of casual sex and engage in "one-night stands" (Brennan & Shaver, 1995; Fraley, Davis, & Shaver, 1998). This approach to sex may indicate a reluctance to get emotionally involved with or committed to any particular sexual partner (e.g., Tidwell et al., 1996; Brennan & Shaver, 1995). Consistent with this notion, Schachner and Shaver (2002) found that "mate poaching," or attempting to attract someone who is already in a relationship, and being open to being "poached" by others – in the context of short-term but not long-term relationships – is associated with avoidance. In fact, "relationship exclusivity," measured by a scale designed by Schmitt and Buss (2000), is negatively correlated with attachment avoidance, suggesting that avoidant people tend to be promiscuous and nonexclusive in their relationships (Schachner & Shaver, 2002).

With regard to anxious individuals, Birnbaum et al. (2002) found clear evidence for the underlying action of their hyperactivating strategies in the construction of their sexual experiences. Specifically, they scored relatively high on subscales tapping desire for partner's emotional involvement during heterosexual intercourse and attempts to please the partner and satisfy his or her demands during this sexual activity. Similarly, Tracy et al. (in press) found that anxious adolescents engage in sex primarily to please their partners, feel accepted, and avoid abandonment. Anxious individuals also tend to worry about losing their partners, and the ones in our recent studies (Schachner & Shaver, 2002) actually had lost their partners more often than less anxious individuals. Even if they try to "poach" other people's partners, as many avoidant individuals do, they do not succeed as often as less anxious individuals. Perhaps these experiences and concerns explain why anxious adults, especially women, are more likely than their less anxious counterparts to have cosmetic surgery in an attempt to make themselves more acceptable to potential relationship partners (Davis & Lesbo, in press).

*Affiliation system.* We have initial evidence suggesting interplay between attachment security and activation of the affiliation behavioral system, a system that meets an evolved need for sociability with others and motivates people to spend time in the company of others (Weiss, 1998). In a correlational study, Shaver et al. (1996) found that reports of secure attachment were positively associated with self-reports of sociability. This correlation fits with results reported by other researchers (e.g., Bartholomew & Horowitz, 1991; Griffin & Bartholomew, 1994).

Mikulincer and Selinger (2001) provided further evidence for this association in their assessment of adolescents' same-sex friendships. Findings indicated that secure adolescents placed high value on both attachment goals (support, security) and affiliation goals (accomplishment of joint projects, having fun together) in their same-sex friendships. Moreover, they were responsive to the activation of both the attachment and affiliation systems and changed their goals in accordance with contextual cues that activate these systems. They pursued more attachment goals in attachment-activating contexts (disclosing a secret, being in a sad mood) and more affiliation goals in affiliation-activating contexts (going together to a party, being in a happy mood). In contrast, insecure adolescents showed less flexibility in the activation of the attachment and affiliation systems. Anxious adolescents were exclusively focused on attachment goals and tended to pursue more attachment than affiliation goals in both attachment- and affiliation-activating contexts. Avoidant adolescents tended to dismiss both attachment and affiliation goals in the two types of contexts.

The findings for insecure individuals seemed to result from the underlying action of secondary attachment strategies. Avoidant people's deactivating strategies were manifested not only in inhibition of the attachment system (reluctance to pursue attachment goals even when contextual cues encouraged engagement in attachment behaviors), but also in inhibition of the affiliation system. Perhaps this occurs because activation of this system counteracts avoidant people's emotional detachment from a partner. Anxious people's hyperactivating strategies were manifested in a chronic, undifferentiated search for support and security and the concomitant dismissal of affiliation goals even when contextual cues encouraged the pursuit of these goals.

*Summary*

Our research program has provided extensive evidence regarding the three different modules of our model. Specifically, our studies have clearly supported our hypotheses concerning (a) effects of threat contexts on attachment-system activation; (b) effects of the excitatory and inhibitory circuits associated with secondary attachment strategies on the monitoring and appraisal of threatening events, preconscious activation of attachment-related mental representations, and monitoring and appraisal of attachment-figure availability; (c) effects of the actual presence of an available attachment figure or of contextual cues that activate representations of available attachment figures on the enactment of security-based strategies; (d) declarative and procedural components of attachment strategies; (e) manifestations of these strategies in the management of interpersonal behavior, construction of close relationships, processing of attachment-related and -unrelated sources of threats, and regulation of distress; and (e) implications of attachment strategies for representations of the self and others, relationship quality, mental health and adjustment, and the functioning of other behavioral systems (exploration, caregiving, sex, affiliation).

Several of our studies have also shown that the observed patterns of attachment-system activation and the documented psychological manifestations and implications of attachment strategies are unique to individual variations in attachment-related anxiety and avoidance. Specifically, the observed effects of the attachment dimensions cannot be accounted for statistically by a host of other individual-difference variables that are consistently and systematically associated with attachment-related anxiety and avoidance, such as neuroticism (Shaver & Brennan, 1992), trait anxiety (Mikulincer, Gillath, and Shaver, 2001; Mikulincer & Sheffi, 2000), global distress (Mikulincer et al., 2002), extraversion (Shaver & Brennan, 1992), self-esteem (Taubman Ben-Ari et al., in press), reported mood (Mikulincer, Gillath, et al., 2001, in press; Mikulincer, Hirschberger, et al., 2001), social desirability (Mikulincer & Orbach, 1995; Taubman Ben-Ari et al., in press), and sociability (Shaver & Brennan, 1992). These findings rule

out several alternative explanations and argue for the distinctive dynamics and functioning of the attachment system in adulthood.

### *Unresolved Conceptual and Empirical Issues*

Despite the strengths of attachment theory and research, many conceptual and empirical issues have yet to be fully tackled. We have begun to address some of the unresolved conceptual issues in recent papers (Mikulincer, Shaver, & Pereg, in press; Shaver & Mikulincer, in press-a, in press-b, in press-c) and to deal with related empirical issues in our ongoing studies. Here, we present a conceptual and empirical agenda for adult attachment theory and research in the near future.

### *Cognitive and Neural Substrates of Attachment-System Activation*

We need to devote more attention to the first module of our model (Figure 2), attachment-system activation. To date, most of our research efforts have been directed at understanding the psychological manifestations and consequences of people's attachment styles, and only a few recent studies have documented the psychological reality of attachment-system activation (Mikulincer et al., 2000; Mikulincer, Gillath, & Shaver, 2001). Many important questions about the activation process remain unanswered. For example, are proximity-seeking goals automatically activated by encounters with threats? (We have already shown that proximity-related memory nodes are activated.) Are episodic memories of attachment interactions activated by these encounters? What are the functions of such memory activation and how do they relate to representations of attachment figures and proximity-seeking goals? How does attachment-system activation interact with automatic activation of other, attachment-unrelated defensive goals (e.g., self-enhancement)? What are the cognitive and affective processes that determine the passage from preconscious attachment-system activation to conscious thoughts, behavioral intentions, and actual behavior? Without knowing the answers to these questions, we cannot fully specify the cognitive substrate of attachment-system activation.

Research should also examine whether the attachment system is activated under neutral, non-threatening conditions. Proximity-seeking goals, like other well-learned goals, can

presumably be activated automatically by environmental stimuli that frequently covary with them. Bargh (1990) suggested that if a goal is frequently and consistently activated in the presence of specific contextual cues (e.g., a relationship partner), the goal will come to be activated by these cues without the person consciously intending to pursue it. It therefore seems likely that encounters with an attachment figure can activate proximity-seeking goals even under non-threatening conditions, because this person has been present during the activation of these goals in many previous threatening situations. At the cognitive level, this idea implies that the contextual activation of representations of attachment figures automatically spreads to proximity-seeking goals. At the relationship level, this associative connection can explain the search for closeness and intimacy with a relationship partner under non-threatening conditions and the establishment of *threat-free* attachment bonds with this partner.

Research is also needed on the physiological and neural substrates of attachment-system activation. Presumably these involve autonomic nervous system activation and neuroendocrine responses. Variations in these responses are frequently observed during the arousal and alleviation of distress (Diamond, 2001), so they should be related to the regulatory functions of the attachment system. But there may also be unique attachment-related brain processes that can be identified. Research should examine the cortical and subcortical regions involved in attachment-system activation and the initiation of attachment strategies; it should map patterns of electrophysiological activity during the processing of threat-related stimuli (e.g., when pursuing hyperactivating or deactivating strategies). Researchers could use Evoked Reaction Potential (ERP) and functional magnetic resonance imaging (fMRI) techniques for delineating the cognitive components (orienting response, expectation, memory) and brain regions (e.g., amygdala, anterior cingulate) involved in attachment-system activation and functioning.

Some of these processes may also be identifiable, at least in a preliminary way, by using cognitive research paradigms. Cohen and Shaver (2002) recently investigated possible cerebral hemisphere differences in attachment-related information processing associated with avoidant individuals' imperviousness to positive affect manipulations (see for example, Mikulincer &

Sheffi, 2000, discussed earlier in this chapter). Cohen and Shaver (2002) presented positive and negative attachment-related words in the left and right visual fields of more and less avoidant individuals, asking them to make a rapid decision in each case about positivity vs. negativity. Avoidant individuals proved to be less accurate than non-avoidant individuals in detecting positive words when these were presented to the right hemisphere, the frontal (decision-making) lobe of which has been associated with negative affect and withdrawal tendencies. These results, like many of the others summarized in this chapter, strongly suggest that attachment-style differences in behavior are associated with systematic differences in brain functioning. Pursuit of more precise and powerful methods of studying these differences would be highly desirable.

#### *The Construct of Attachment-Figure Availability*

Because of the importance of the attachment-figure availability module in our model (the second module in Figure 2) in triggering different attachment strategies, we need more research that refines and elaborates this part of the activation process. According to Bowlby (1973), attachment-figure availability is a matter of the figure's sensitivity and responsiveness to bids for proximity in times of need. However, generating a positive, optimistic attitude toward proximity seeking is not sufficient for creating a sense of attachment security in an attached individual. The partner, or attachment figure, must also collaborate effectively with the individual in coping with threats and provide effective coaching and support for removing the threat and alleviating distress. More couples research is needed to explore the contribution of one partner's caregiving responses to the other partner's attachment system. Recent studies conducted by Collins and her colleagues provide important initial information on this issue (Collins & Feeney, 2000; Feeney & Collins, 2001).

A related issue concerns Emde's (1980) definition of *availability*. For him, availability includes openness to emotional dialogue, attunement to a relationship partner's diverse needs and goals, and acceptance of the full range of the partner's emotions, not just being responsive to threat-related concerns and expressions of distress. That is, availability also includes responsiveness to another's positive affect as well as acceptance and encouragement of his or her

separateness and autonomy needs. Biringen, Robinson, and Emde (1998) also added to this definition the ability to be available without intruding on the other's autonomy and to maintain patterns of communication that are not hostile, impatient, or antagonistic.

Cassidy (1994) suggested that the sense of attachment security in infancy results from interactions with a caregiver who is emotionally accessible, responsive, and expressive. In these interactions, the infant learns that emotional states can be tolerated and transformed; he or she feels comfortable exploring and learning about emotions, and expects that the caregiver will help regulate distress. Research should examine whether these ideas can be applied to adult close relationships. Specifically, studies should map out the various forms partner's availability can take in adult relationships, explore partners' attunement to dependence and autonomy needs as well as positive and negative emotions, and examine the effects of these interaction patterns on the formation of a within-relationship sense of attachment security.

In a recent study, we (Banai, Mikulincer, & Shaver, 2002) also extended Bowlby's availability construct to include what Kohut (1971) called the experience of mirroring (being noticed and admired for one's qualities and accomplishments) and twinship (fitting in comfortably with others). Although receiving emotional support can strengthen one's sense of being loved by a partner, the partner's lack of admiration and praise can damage one's sense of self-worth and result in the construction of negative working models of the self. Couple members' failure to fit comfortably together (by virtue of not being similar, or *simpatico*, in important respects) can lead to misunderstandings and relational conflicts that foster negative working models of others. Future studies should examine whether and how the provision of mirroring and twinship experiences during the initial phases of adult relationships contributes to the formation of a within-relationship sense of attachment security.

#### *Security-Based Strategies, Self-Regulation, and the Autonomous Self*

The conceptualization of security-based strategies raises an important issue concerning the dynamic interplay between these strategies and self-regulation. At first thought, one might expect security-based strategies, which lead people to rely on the help of attachment figures



when coping with threats, to interfere with autonomy and independence (see Kirkpatrick, 1998, for an exposition of this reasoning). That is, attachment-figure availability might favor reliance (even over-reliance) on others – for co-regulation of distress (see Tronick, 1989, for an example of this concept) – at the expense of autonomous self-regulation. As a result, securely attached individuals would be chronically driven to seek support from relationship partners instead of coping by using their own skills and relying on themselves to regulate distress.

But this reasoning is at odds with our ideas and empirical findings concerning the characteristics of security-based strategies in adulthood. In our model, support seeking and effective co-regulation of distress are part of only one component of security-based strategies. In fact, beyond support seeking, these strategies include a strong sense of mastery, agency, and self-directedness as well as reliance on instrumental problem solving and active transformational methods of coping that do not require others' assistance. Moreover, one of the main effects of these strategies is to build a person's inner resources for maintaining mental health even in situations where attachment figures are absent or the provision of support is blocked. The findings reviewed here also highlight the fact that secure individuals develop a caring attitude toward relationship partners and become active agents responsible for their partners' welfare and relationship quality rather than passive recipients of caring and comfort. These qualities seem to be part of an autonomous rather than a dependent personality (Alonso-Arbiol, Shaver, & Yáñez, in press). Overall, our model implies that attachment-figure availability facilitates the autonomous management of distress.

Recently, we (Mikulincer, Shaver, and Pereg, in press) suggested that attachment-figure availability during infancy and early childhood not only reinforces reliance on the primary attachment strategy, but also provides a basis for the development of self-regulatory skills. With the maturation of these skills during childhood and adolescence, recurrent episodes of attachment-figure availability favor the passage from co-regulation to self-regulation and reliance on the self as the main executive agency of security-based strategies. We also proposed three mechanisms that mediate the association between attachment-figure availability and self-

regulation – the broadening of a person’s perspectives and capacities, expansion of the self, and internalization of functions that were originally accomplished by attachment figures.

The first mechanism involves activation of other behavioral systems (e.g., exploration, caregiving, and affiliation) following attachment-figure availability and the resulting broadening of perspectives and capacities. Activation of the exploration system leads people to distance themselves from attachment figures, explore the environment on their own, and learn new things about the world and the self that enrich their self-regulatory skills. Activation of the caregiving system allows people to learn how to help regulate others’ distress. This learning strengthens their sense of mastery and can be applied to the regulation of their own distress. Activation of the affiliation system provides an increased range of social options for exploring personal interests, developing skills, and broadening one’s self-conception.

A related process is what Aron, Aron, and Norman (2001) called “expansion of the self.” – the inclusion of a partner’s resources and strengths in one’s self-concept. Attachment-figure availability can set this process of self-expansion in motion. During effective co-regulation episodes, the partner’s responses are synchronized with a person’s needs and the partner can be experienced as part of the self. As a result, the person can incorporate the partner’s resources into the self, which in turn facilitates the development of a sense of mastery and a belief that the self has capacities for handling distress alone. The process of self-expansion by including another in the self seems highly metaphorical on first encounter, but it has been well validated in both cognitive and psychophysiological research (see Aron et al., 2001, for a review).

A third process is what Kohut (1971) called “transmuting internalization,” which involves the internalization of regulatory functions that were originally performed by the attachment figure, with the individual gradually acquiring the capacity to perform these functions autonomously. In our view, attachment-figure availability promotes a sense of self-worth and efficacy, and then makes co-regulation less necessary, because people become more confident of their ability to handle distress alone. As a result, people become less dependent on external agents for dealing with threats, and the self becomes the major agent of affect regulation.

This analysis implies that the development of self-regulation depends on attachment-figure availability. Without effective co-regulation of distress, the activation of other behavioral systems, the expansion of the self, and the process of transmuted internalization are blocked and the development of self-regulation is disrupted. Our analysis also implies that coming to rely on oneself as the main regulatory agent need not inhibit co-regulation. Rather, the self can incorporate support seeking and reliance on others within its regulatory devices and still engage in co-regulation when needed. That is, secure individuals can autonomously choose to be dependent on others without feeling that support seeking implies personal weakness or helplessness. For example, a person can mobilize external sources of support during life transitions or traumatic experiences that disrupt the sense of self-worth and deplete inner resources. Furthermore, he or she can activate internal representations of attachment figures during encounters with threats in order to experience feelings of security and comfort that are necessary for engaging in effective self-regulatory efforts.

In other words, security-based strategies in adulthood reflect both the passage from co-regulation to self-regulation and the incorporation of co-regulation within a person's repertoire of self-regulatory skills. In fact, whereas anxious people's hyperactivating strategies seem to block the transition from co-regulation to self-regulation, avoidant people's deactivating strategies interfere with reliance on others as a potential regulatory device. Future research should examine the psychological mechanisms that mediate the transition from co-regulation to self-regulation and the dynamics of the integration of co-regulation and self-regulation. Research should also explore the contextual and personal factors that activate co-regulation in adulthood and the ways in which mental representations of attachment figures facilitate self-regulatory attempts.

#### *The Initiation of Secondary Attachment Strategies*

In our model, the triggering of a specific secondary attachment strategy (deactivating or hyperactivating) following attachment-figure unavailability depends on the extent to which proximity seeking is appraised as a viable regulatory option. (See the third module in Figure 2.) However, the model does not specify the situational and personal antecedents of this appraisal

process in adulthood. Recently, we (Mikulincer, Shaver, and Pereg, in press) tentatively outlined the proximal and distal factors that may affect this process. Proximal factors include the states of mind produced by attachment-figure unavailability that contribute to activation of a specific secondary attachment strategy. Distal factors include the external and internal antecedents of these states of mind.

According to our analysis, attachment-figure unavailability can result in two kinds of painful states of mind. One is organized around the failure of attachment behaviors to achieve a positive result (closeness, love) and the receipt of punishment (inattention, rejection, anger) following these behaviors. In this state of mind, proximity to the attachment figure is experienced as a condition of non-reward or punishment, and the individual becomes afraid of failure and punishment in future proximity-seeking attempts. The main threat here is proximity to the attachment figure; the predominant fears concern the aversive outcomes that proximity can elicit; and the person is forced to adopt a strategy that minimizes the experience of non-reward/punishment – i.e., a deactivating strategy. In other words, this state of mind favors deactivation of the attachment system and consolidation of avoidant working models.

A second state of mind is organized around a failure to co-regulate distress and the need to deal with threats alone. This state of mind is based on beliefs that attachment-figure unavailability, inconsistency, or insufficiency leaves one helpless and vulnerable in a threatening world, and one must therefore try harder to attain a protective relationship. In such cases, distance from the attachment figure is experienced as dangerous, the person becomes afraid of the aversive outcomes that may result from attempts to regulate distress without the help of attachment figures, and he or she is forced to adopt a strategy that addresses the sense of helplessness and fear of being alone – i.e., a hyperactivating strategy. The person is then biased toward perceiving proximity seeking as viable: The psychological cost of recognizing the non-viability of proximity seeking is so great that the person searches for even minimal signals of attachment-figure availability and expresses anger when these signals are not forthcoming.

We have attempted to specify the likely external and internal antecedents of these two states of mind (Mikulincer, Shaver, & Pereg, in press). On the one hand, any pattern of interaction that strengthens the link between proximity seeking and negative affectivity should lead to the construal of attachment-figure unavailability as a non-reward/punishment condition and to the consequent adoption of deactivating strategies. These patterns of interaction include, for example, consistent inattention, rejection, or angry responses of the attachment figure to proximity seeking; threats of punishment for the display of attachment behaviors; and traumatic/abusive experiences during proximity-seeking attempts. This state of mind is also affected by internal factors that intensify emotional reactions to attachment-figure unavailability, such as arousability/reactivity and intolerance of frustration.

On the other hand, any pattern of interaction with a frustrating attachment figure that prevents the development of self-regulation skills should strengthen a person's sense of helplessness and contribute to the adoption of hyperactivating strategies. These interactions include, for example, a compulsive pattern of caregiving that is unrelated to the individual's requests or need for help; attachment figures' intrusiveness that punishes the person for engaging in autonomy-oriented activities; and attachment figures' explicit or implicit messages that emphasize a person's helplessness. This state of mind can also be exacerbated by temperamental deficits in self-regulation and the control of attention, memory, and behavior.

This analysis is consistent with Ainsworth et al.'s (1978) observation that caregivers of avoidant infants consistently rebuffed or deflected their infant's attachment behaviors and were intolerant of their infants' expressions of vulnerability and neediness. It is also consistent with findings showing that caregivers of anxiously attached infants tend to exhibit inconsistent responsiveness to their infant's needs, being sometimes unavailable and at other times intrusive, overprotective, and interfering with their children's engagement in exploration (see Cassidy & Berlin, 1994, for a review).

Unfortunately, adult attachment research has not provided systematic information about the specific patterns of interaction with a relationship partner in the early stages of a close

relationship that contribute to the formation of within-relationship patterns of attachment anxiety or avoidance. Moreover, the evidence for temperamental contributions to attachment style is still inconsistent and incoherent (Vaughn & Bost, 1999), even though it seems likely to us that temperamental variables are involved. The attachment field still lacks qualitative studies exploring insecure persons' states of mind concerning attachment-figure unavailability, within-relationship studies examining specific patterns of unavailability of relationship partners, and large-scale twin studies of individual differences in attachment.

### *The Nature of Fearful Avoidance*

Another unresolved issue related to the triggering of secondary attachment strategies concerns the dynamics of people who have high scores on both the anxiety and avoidance dimensions – i.e., the more extremely troubled individuals in the ‘category’ that Bartholomew and Horowitz (1991) called *fearful avoidance*. Whereas our model characterizes the dynamics of people who score high on attachment anxiety (anxious individuals) and those who score high on attachment avoidance (avoidant individuals), it makes no explicit statement about how people who score especially high on both anxiety and avoidance answer the question in Figure 2 concerning the viability of proximity seeking.

This is an extremely important issue because many studies in the attachment literature have found “fearful avoidants” to be the least secure, least trusting, and most troubled of adolescents and adults (Shaver & Clark, 1994). In fact, although our research program has not been explicitly focused on highly fearfully avoidant individuals, who are more common in abused or clinical samples, some of our studies reveal either two main effects for the anxiety and avoidance dimensions or an interaction between the dimensions indicating that fearful avoidants have especially negative representations of their romantic partners (Mikulincer, 1998a; Mikulincer & Arad, 1999), are unusually closed and rigid cognitively (Mikulincer, 1997), exhibit the least empathy for others who are distressed (Mikulincer, Gillath, et al., 2001), and report severe personality disorders (Brennan & Shaver, 1998), and the poorest mental health under stressful conditions (Berant et al., 2001a, 2001b).

In a recent commentary on our model, Simpson and Rholes (in press) suggested that fearful avoidant persons are unable to coherently answer the question, “Is proximity-seeking a viable option?” and so cannot choose between deactivating and hyperactivating strategies. As a result, Simpson and Rholes (in press) claim that these persons “...may enact both strategies in a haphazard, confused, and chaotic manner...their behavior under stress may be an incoherent blend of contradictory, abortive approach/avoidance behaviors or perhaps paralyzed inaction or withdrawal.” This description of fearful avoidants’ psychological dynamics resembles the “disorganized” attachment pattern observed in infants in the strange situation (Main & Hesse, 1990). These infants are characterized by simultaneous or rapidly vacillating displays of approach and avoidance behavior toward the attachment figure as well as by aimless, disoriented, and confused actions in response to attachment-figure unavailability.

In our view, Simpson and Rholes’s reasoning provides an important insight into the attachment dynamics of fearful avoidant individuals. These dynamics can be incorporated into our model as an additional path that represents a failure to achieve any of the goals of the major attachment strategies: safety and security following proximity seeking (the primary, secure strategy), defensive deactivation of the attachment system (the avoidant strategy), or chronic activation of the attachment system until security-enhancing proximity is at least temporarily attained (the anxious strategy). Take for example the case in which deactivating strategies fail to attain their regulatory goals due to encounters with severe and prolonged traumatic events that a person cannot dismiss or deny. In this case, the attachment system is re-activated despite the deactivating strategies, attachment-related worries become accessible, and the individual becomes entrapped in a cycle of useless attempts at avoidance and the unwanted intrusion of attachment anxiety. This cycle resembles the dynamics of post-traumatic stress disorder (Horowitz, 1982) and may lead to the consolidation of an incoherent, disorganized pattern of ineffective deactivating strategies together with an unwanted activation of the attachment system.

This conceptualization of fearful avoidance fits with the findings mentioned above that depict them as the most troubled of the four major attachment-style groups. It also fits with

findings showing that the lives of fearful avoidant individuals have been scarred by physical or sexual abuse or other attachment-related traumas that a person cannot dismiss or deny (e.g., Brennan & Shaver, 1998; Brennan, Shaver, & Tobey, 1991; Shaver & Clark, 1994).

It is important to note that when we refer to fearfully avoidant individuals, we are thinking of very high scores on both the anxiety and avoidance dimensions, not all people who might select the fearfully avoidant self-description on the Bartholomew and Horowitz (1991) categorical measure. In our opinion, that measure provides too low a hurdle for classification into the least secure category, and this creates too large a discrepancy between the clinical literature on disorganized attachment (reviewed by Lyons-Ruth & Jacobvitz, 1999) and the social-psychological literature based on Bartholomew and Horowitz's (1991) measure and normal samples of college students. In the future, researchers should devote more attention to the measurement of fearful avoidance in community and clinical samples as well as the functioning of the attachment system of persons who score specially high on both anxiety and avoidance.

*Considering Both Partners in a Relationship: A Systemic Model of Attachment Dynamics*

Although our model is focused on the intrapsychic dynamics of the attachment system, it acknowledges that these dynamics are sensitive and responsive to contextual cues in general and to a relationship partner's behavior in particular. In fact, attachment-system activation and functioning occur in an interactional context and partly depend on the partner's responses. In the three main components of the model, the partner's behaviors can affect the focal individual's attachment system. For example, the partner can be a source of threat (e.g., by threatening abandonment or violence) and can affect the appraisal of attachment-figure availability as well as the viability of proximity seeking as a means of achieving security while interacting with this partner. Therefore, the relationship partner should be introduced more explicitly into the model, and researchers should take both partners' characteristics and behaviors into account when studying relational cognitions, emotions, and behaviors.

Some of our studies have already demonstrated the importance of a partner's attachment dynamics in explaining an individual's construction of, and satisfaction with, close relationships.



Brennan and Shaver (1995) reported that both partners' attachment security added to the prediction of each partner's reports of satisfaction in a romantic relationship, after controlling for variance in relationship satisfaction due to a person's own attachment security. Similarly, Mikulincer and Erev (1991) found that a person's reported romantic love was directly affected by his or her partner's attachment style. Mikulincer, Florian, and Hirschberger (2002) reported that a person's scores on attachment anxiety and avoidance had differential effects on daily relational emotions, cognitions, and behaviors depending on his or her partner's attachment scores. The importance of a partner's attachment dynamics has also been documented in other studies using observational techniques, diary keeping, and narrative accounts (e.g., Collins & Feeney, 2000; Feeney, 2002; Feeney & Hohaus, 2001; Simpson, Rholes, & Nelligan, 1992).

When the partner is fully introduced into the model, and is considered as an additional focal individual, a foundation is provided for a systemic model of attachment dynamics at both the personal and interpersonal levels (see also Feeney, in press, and Mikulincer, Florian, Cowan, and Cowan, in press, for discussions of systemic attachment models). As a result, Figure 2 should be duplicated in order to represent the attachment dynamics of the two partners, and bidirectional arrows should be drawn connecting the components and strategies of the two partners' attachment systems. In this representation, a person's cognitions, emotions, and behaviors are organized around intrapsychic and interpersonal regularities related to both partners' attachment dynamics. Specifically, the partners reciprocally influence each other, and changes in the attachment dynamics of one partner are likely to have effects throughout the attachment system of the other partner. In the future, researchers should devote more attention to the complex connections between partners' attachment dynamics and the ways in which both partners' attachment systems alter the quality of their relationship.

#### *Adult Attachment Bonds*

Although most of the research on the interpersonal manifestations of attachment dynamics in adulthood has been conducted within romantic and marital relationships, one cannot completely equate attachment bonds to romantic love. First, attachment strategies can be directed

toward non-romantic partners such as friends, counselors, teachers, therapists, and even groups and organizations. Second, although all children are attached to their primary caregivers (Cassidy, 1999), romantic partners do not necessarily function as attachment figures for each other. The formation of an attachment bond within a romantic relationship depends on both partners' attachment styles and the extent to which one person serves attachment functions of safe haven and secure base for the other (see Fraley & Shaver, 1999, 2000, for more detailed discussions). Third, even when partners function as attachment figures, some dyadic interactions reflect the underlying action of other behavioral systems rather than the attachment system.

The diversity of relationships in which the attachment system is activated and the diversity of behavioral systems that are involved in romantic relationships raise several issues that are still unresolved. One issue concerns the formation, dissolution, and reorganization of attachment bonds. Because adults can have multiple attachment figures and can transfer attachment functions from one partner to another, more conceptual and empirical effort should be directed toward understanding why and how a specific partner is targeted as a potential attachment figure. Specifically, what partner characteristics and behaviors make him or her more likely to become an attachment figure? How does a person become attached to such a partner? How are the diverse attachment figures organized into what Bowlby (1979) called a "hierarchy" of attachment figures? In addition to grappling with these matters, researchers should examine the dissolution of attachment bonds: Why and how does a relationship partner stop functioning as an attachment figure? Special attention should be given to reorganization of attachment bonds following the dissolution of a romantic relationship (e.g., divorce, separation, or death) and to the phenomenon of continuous attachment to a lost partner (see Fraley & Shaver, 1999; Mikulincer & Florian, 1996, for discussions). Of course, research should also examine the involvement of attachment strategies in these processes and the ways in which people with different attachment styles negotiate the formation, dissolution, and reorganization of attachment bonds.

Another underdeveloped research area concerns the interplay of the attachment system and other behavioral systems within romantic relationships. Shaver et al. (1988) argued that

romantic love involves the integration of the attachment, caregiving, and sexual systems.

However, most subsequent studies have focused mainly on the pivotal role of the attachment system and the contribution of attachment security to caregiving and sexuality (see Feeney & Collins, 2001, for an exception). We lack information about the contribution of individual differences in the caregiving and sexual systems to partners' attachment dynamics as well as the way the three behavioral systems are coordinated and integrated. Researchers should also look more deeply into the interplay between the attachment and exploration systems, and between dependency and autonomy needs within romantic relationships.

### *Development, Stability, and Change*

Attachment theory is a theory of personality functioning and intrapsychic structure, a theory about the construction of interpersonal behavior, emotional bonds, and close relationships, and a theory of personality development. In this chapter and in most of the research on which it is based, we have attempted to understand attachment-system functioning and attachment-related variations in intrapsychic organization and close relationships. We have devoted less attention to the developmental origins of these variations and to Bowlby's (1973) contention that early childhood experiences shape attachment dynamics. Although our model does not deal directly with personality development, we have explicitly posited that the chronically accessible working models of attachment that result from the internalization of past experiences affect the three main components of the model. As such, a person's attachment dynamics in adulthood should reflect his or her past experiences, perhaps beginning in infancy. Of course, this simple contention needs elaboration and an explicit developmental model of attachment dynamics (Fraley, 2002).

Although not developmentalists by training, we have conducted a number of studies in which adults were asked about childhood relationships with parents and about experiences that might be expected to have a long-term impact on attachment style. Brennan et al. (1991) found, for example, that attachment insecurity in adulthood was related to childhood experiences with one or more parents who had a serious drinking problem. Shaver and Clark (1994) found that fearful avoidant attachment was related to childhood experiences of physical and sexual abuse.

Brennan and Shaver (1993, 1998) revealed that experiencing the death of one's father or the divorce of one's parents early in childhood was associated with self-reports of insecure attachment in adulthood. Of course, these studies are not sufficient to make a strong case for the developmental origins of adult attachment style. More longitudinal studies should be conducted, linking self-report measures of adult attachment to measures of attachment-related experiences in infancy and childhood.

Even after several good longitudinal studies have been conducted, however, we do not expect the developmental trajectory of attachment orientations to be linear or in any other way simple. We believe that attachment orientations are not based only on childhood experiences. Current attachment dynamics are also likely to be affected by a broad array of contextual factors that moderate or even override the effects of internalized representations of past experiences. In fact, Bowlby (1988) claimed that these representations can be updated throughout life, and he selected the word "working" in the phrase "internal working models" partly to represent the changing nature of these cognitive-affective structures.

The unstable nature of working models is made more likely when one considers recent cognitive theories (e.g., Anderson, 1994) that portray mental representations as associative neural networks. These networks can change, subtly or dramatically, depending on context and recent experiences. In such theories, psychological reality is constituted by a series of neural networks, each containing millions of cells, which together can represent either specific experiences or averages of representations of specific experiences, depending on what is being thought about or has been mentioned or experienced recently. Just as repeated experiences in other domains lead to excitatory and inhibitory connections between many nodes in a network, repeated experiences with attachment figures, especially the most important and lasting ones, forge central tendencies in neural networks that make some working models chronically accessible. These tendencies, however, can be modified by many contextual factors, such as current interactions with a partner, the attachment dynamics of the partner, a person's current life situation, and contextual activation of less accessible attachment-related mental representations.

In line with this reasoning, every model of attachment dynamics should include ideas concerning contextual and more long-lasting changes in the functioning of the attachment system. This module is particularly relevant for creating adequate attachment-oriented psychotherapies and for understanding factors in the client-psychotherapist relationship that foster symptom alleviation and personality change (Shaver & Norman, 1995). In this context, our studies on the positive effects of the contextual activation of security-enhancing mental representations (e.g., Mikulincer, Gillath, et al., 2001; Mikulincer & Shaver, 2001) can be viewed as an initial step in developing a research program on attachment and psychotherapy. This program should examine the construct of “working alliance,” the functioning of the psychotherapist as a security-enhancing attachment figure, changes in the client’s attachment dynamics caused by attachment to and internalization of this figure, and the ways in which these processes advance psychotherapeutic aims.

A neural network conceptualization of working models has important implications for measurement. The outcome of measurement depends on which networks are accessed by or constructed during the measurement procedure. If we ask research participants to describe a particular ongoing relationship, we may get different results than if we ask about close relationships in general. If we ask about an adult’s relationship with an attachment figure now, we may get different results than if we ask about the earliest memories the person has of relating to this figure during childhood. Therefore, although our studies have obtained systematic, theory-consistent findings using generic self-report attachment measures, it does not mean that such measurement is equivalent to measures of childhood or current relationships with specific relationship partners.

In general, much important work remains to be done in the area of measuring attachment phenomena. The self-report measures on which our research is based were created through a combination of research on infants, intuition, psychometrics, and convenience. Our present measures (Brennan et al., 1998) were created by factor analysis of many previous measures, and the items consequently range from ones concerned with relationships in general to ones

concerned with a particular partner. Some deal with “comfort” and other feelings; some deal with desires and motives. They were all based on item writers’ exposure to the attachment literature, but in most cases were not designed component-by-component with a coherent theoretical model in mind. Given their relative crudeness, it is remarkable how systematic and cumulative our research findings have been.

### *Concluding Remarks*

We began this chapter with personal observations and will conclude in the same vein. Neither of us realized or dreamed when we began studying individual differences in adult attachment 15 years ago that by now we would have accumulated so many diverse, intriguing, and coherent findings. Bowlby’s theory has clearly been generative and Ainsworth’s methodological creativity has been inspiring. Today, a literature search on “attachment” turns up thousands of studies motivated by attachment theory, including a few hundred related to our own measures and models, and there is still no end in sight.

Research in this area confirms what we said at the outset, that the human mind/brain is a social machine. The brain evolved in highly social contexts and was “designed” by evolution to solve important problems of survival and reproduction within those contexts. The size of the brain and its incomplete programming at birth, combined with the highly immature and incompetent body in which it is born, makes each person dependent on “older and wiser” caregivers from the beginning. This need for others slowly gives way, in a “good enough” relational environment, to increased self-regulation and autonomy as well as mutually supportive couple relationships. The need for others, both real and symbolic, is perpetual, and the possibilities for attachment injuries all through life are numerous, so there are many opportunities to get shunted off onto an insecure path. We hope our research will stimulate others, as Bowlby and Ainsworth’s work inspired us, and that together we will create a more complete and powerful theory of the social mind, one that provides an improved foundation for individual and couples therapy – and perhaps contributes eventually to a more tolerant and supportive world.

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Table 1

Original Three-Category Measure of Romantic Attachment Style (Hazan & Shaver, 1987, 1990)

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I am somewhat uncomfortable being close to others; I find it difficult to trust them completely, difficult to allow myself to depend on them. I am nervous when anyone gets too close and often, others want me to be more intimate than I feel comfortable being. (**Avoidant**)

I find that others are reluctant to get as close as I would like. I often worry that my partner doesn't really love me or won't want to stay with me. I want to get very close to my partner and this sometimes scares people away. (**Anxious**)

I find it relatively easy to get close to others and am comfortable depending on them and having them depend on me. I don't worry about being abandoned or about someone getting too close to me. (**Secure**)

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*Figure Captions*

Figure 1. Diagram of the two-dimensional space defined by attachment anxiety and attachment avoidance. The terms in the four quadrants are Bartholomew's (1990) names for the four major attachment styles.

Figure 2. Shaver and Mikulincer's (in press) integrative model of the activation and dynamics of the attachment system.



