Attachment-related psychodynamics

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ABSTRACT   Because there has been relatively little communication and cross-fertilization between the two major lines of research on adult attachment, one based on coded narrative assessments of defensive processes, the other on simple self-reports of 'attachment style' in close relationships, we here explain and review recent work based on a combination of self-report and other kinds of method, including behavioral observations and unconscious priming techniques. The review indicates that considerable progress has been made in testing central hypotheses derived from attachment theory and in exploring unconscious, psychodynamic processes related to affect-regulation and attachment-system activation. The combination of self-report assessment of attachment style and experimental manipulation of other theoretically pertinent variables allows researchers to test causal hypotheses. We present a model of normative and individual-difference processes related to attachment and identify areas in which further research is needed and likely to be successful. One long-range goal is to create a more complete theory of personality built on attachment theory and other object relations theories.

KEYWORDS: attachment theory – adult attachment – affect-regulation – defenses – psychodynamic – personality

Over the past 15 years, attachment theory (Bowlby, 1969/1982, 1973, 1980) has gener-ated two lines of research based on slightly different conceptualizations and assess-ments of individual differences in adult attachment (see Bartholomew & Shaver, 1998; Cassidy & Shaver, 1999; and Simpson & Rholes, 1998, for overviews of the two lines). The first was begun by developmental psychologists (Ainsworth, Blehar, Waters, & Wall, 1978) who used observational techniques to study infant–parent relationships, and was subsequently extended by developmentalists and clinicians who used inter-views to study parents' 'state of mind with respect to attachment' (Main, Kaplan, & Cassidy, 1985; see Hesse, 1999, for a review). The second line of research was initiated in the mid-1980s by social psychologists (Hazan & Shaver, 1987; see Feeney, 1999b, for a review) who applied Bowlby's and Ainsworth's ideas to the study of romantic relationships and developed self-report measures suitable for use in experiments and surveys. Although both lines of research deal with secure and insecure strategies of affect regulation (the latter sometimes called hyperactivating and deactivating strategies; e.g. Dozier & Kobak, 1992), and both kinds of measures can be used to classify individuals into categories thought to be psychodynamically similar to those first identified by Ainsworth and her colleagues (1978) in studies of infants, researchers have found only from modest to moderate associations between the two kinds of measure (e.g. Crowell, Treboux, & Waters, 2000; Shaver, Belsky, & Brennan, 2000).

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More important for present purposes, researchers working within the two traditions have tended to ignore each other's work. Most social psychologists do not use the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1985), a clinical interview focused on mental representations of parent–child relationships, and have not attempted to link their self-report measures to earlier assessments of attachment quality in Ainsworth's Strange Situation. Most developmental and clinical psychologists who use the AAI do not also use the social psychologists' self-report measures, and generally do not attempt to use other rigorous methods of measurement that can distinguish conscious from unconscious processes and do not test causal propositions experimentally. Even more important, there are professional ingroup–outgroup tensions between researchers in the two traditions, based (in our opinion) on clinical and developmental researchers' assumption that self-report measures, which seem at first glance to capture only conscious mental processes, cannot plumb the psychodynamic depths revealed by the AAI, and on social psychologists' observation that AAI researchers do not generally use other rigorous research procedures and measures (e.g. semantic priming, affective priming, reaction times, physiological recording) to test causal hypotheses about the workings of the attachment system.

The purpose of the present article is to begin to bridge the conceptual gap between the two research traditions by taking the notion of defenses and unconscious processes seriously and describing, mainly for developmentally and clinically oriented readers, the theoretical and possibly clinical usefulness of simple self-report measures and social psychological procedures and measures. Specifically, in this article we review recent work in the social psychological line of research on adult attachment to document the progress that has been made in testing central hypotheses derived from attachment theory and in exploring unconscious, psychodynamic processes related to affect-regulation strategies and attachment-system activation.

We begin by briefly explaining self-report measures of 'attachment style', as social psychologists call the individual-difference construct first identified by Ainsworth et al. (1978), and briefly comparing these measures with the AAI. We then review a host of studies that demonstrate the ability of self-report measures to delineate differences between secure, avoidant, and anxious individuals' affect-regulation strategies. Next, we summarize recent experimental findings concerning unconscious aspects of attachment-system activation. The studies we review test many of Bowlby's ideas by using rigorous measures borrowed from contemporary cognitive psychology and reveal both normative and individual-difference features of attachment-system activation. They lead to a refined model of attachment-system activation, hyperactivation, and deactivation (shown later in Figure 1). It is our hope that this body of research and the model we present will find a place in the broad field of attachment research and be considered relevant to the missions of developmentalists and clinicians.

SELF-REPORT MEASUREMENT OF 'ATTACHMENT STYLE'

In social/personality psychology, attachment styles are conceptualized as systematic patterns of expectations, needs, emotions, emotion-regulation strategies, and social behavior that result from the interaction of an innate 'attachment behavioral system' (Bowlby, 1969/1982) and a particular history of attachment experiences, usually beginning in relationships with parents (Fraley & Shaver, 2000). Three major styles – Secure,

Anxious, and Avoidant – were first noticed and carefully described by Ainsworth (1967; Ainsworth et al., 1978) in her studies of infant–mother attachment. Their adult parallels in the romantic/marital domain were first studied by Hazan and Shaver (1987), using a qualitative (three-category) self-report measure. Subsequent studies (e.g. Bartholomew & Horowitz, 1991; Brennan, Clark, & Shaver, 1998; Feeney, Noller, & Hanrahan, 1994; Fraley & Waller, 1998) revealed that adult attachment styles are best conceptualized as regions in a two-dimensional space that is conceptually parallel to the space defined by two discriminant functions in Ainsworth et al.'s (1978) summary of research on infant-mother attachment (see their Figure 10, p. 102). The two dimensions defining the space were called *attachment-related anxiety* and *attachment-related avoidance* by Brennan et al. (1998), a practice we will continue here.

In this two-dimensional space, what was formerly called the 'secure type' (Type B in Ainsworth's typology; 'free and autonomous with respect to attachment' in the AAI) is a region where both anxiety and avoidance are low. What was formerly called the anxious/ambivalent (or anxious/resistant) type (Ainsworth's Type C; 'preoccupied with attachment' in the AAI) refers to the region in which anxiety is high and avoidance is low. What was called 'avoidant' (Ainsworth's Type A) refers to a region with a more complex history. In Ainsworth et al.'s diagram (1978, p. 102, Figure 10), the A infants occupied mainly the region where avoidance was high and anxiety was low. When the infant categories were extended to the adult domain, Main et al. (1985) called this form of avoidance 'dismissing with respect to attachment'. Bartholomew (1990; Bartholomew & Horowitz, 1991) then drew a distinction between 'dismissing avoidants' (high on avoidance, low on anxiety) and 'fearful avoidants' (high on both avoidance and anxiety). In our review of the social psychological literature, we will switch back and forth between typological and dimensional terms, because some of the studies were conducted when social psychologists used typological (three- or four-category) self-report measures and others were conducted after most researchers agreed that dimensional measures are more appropriate and precise.

The two dimensions can be 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). To date, the measures have worked as well in other languages as in their original English form (see, for example, some of the articles we cite later by Mikulincer and colleagues whose work is conducted in Hebrew). 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', 'I feel comfortable depending on romantic partners' (reverse scored), 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), 'I resent it when my partner spends time away from me', and 'I get frustrated if romantic partners are not available when I need them'. The two scales were conceptualized as independent, like the two discriminant functions reported by Ainsworth et al. (1978), and in fact have been found to be empirically uncorrelated in most studies. Notice that the items ask about behaviors and feelings in close relationships, not about the unconscious processes that may underlie them.

A person's location in the conceptual space defined by the anxiety and avoidance dimensions influences both how his or her relationships unfold over time and how they unravel at the end. People who score high on the anxiety dimension have an

intense need to be close, accepted, supported, and reassured, which is likely to create difficulties for a partner, especially one who is avoidant (see Feeney, 1999b, for a review). People who score high on the avoidance dimension are uncomfortable with closeness, self-disclosure, feelings and expressions of vulnerability, and dependency, which is likely to create difficulties for a partner, especially one who has a strong desire for closeness and reassurance.

Self-report measures of adult attachment style differ in a number of ways from the AAI used by Main and her colleagues (George, Kaplan, & Main, 1985; Main & Goldwyn, 1998; Main et al., 1985). These researchers have relied on a narrative approach to elicit 'working models of attachment' or 'state of mind with respect to attachment'. The 60- to 90-minute AAI (described in detail by Hesse, 1999) asks interviewees to choose five adjectives to describe their childhood relationship with their mother and five to describe their childhood relationship with their father, to supply anecdotes illustrating why these adjectives are appropriate, to speculate about why their parents behaved as they did, and to describe changes over time in the quality of their relationships with their parents.

Based on assumptions that can be traced back to Bowlby's and Ainsworth's early formulations concerning infant–parent attachment (Bowlby, 1969/1982; Ainsworth et al., 1978), the creators of the AAI assumed that attachment patterns are best conceptualized as categories or types. Coding of the AAI is based on 5 continuous rating scales intended to capture the probable quality of early experiences, separately with mother and with father (e.g. loving, rejecting, neglecting), and on 12 scales that describe the individual's current state of mind regarding those experiences (e.g. idealizing, continuing anger, derogation of attachment, coherence of the narrative). Based on a configural analysis of these scales, which are thought to represent strategies of affect-regulation while talking about attachment relationships (Hesse, 1999), a primary attachment category is assigned.

Three primary categories of attachment have been investigated: Secure, Dismissing of attachment, and Preoccupied with attachment. AAI narratives are coded as indicative of secure working models of attachment if an interviewee describes positive relationships in a clear, convincing, and coherent manner or if negative relationships are described coherently with an appropriate degree of perspective. The narratives are coded as indicative of insecure-dismissing working models of attachment if the interviewee dismisses the importance of early attachment relationships or idealizes them and provides no clear examples to support his or her characterizations, or as insecure-preoccupied if narrative coherence is disrupted by preoccupying anger or high anxiety when an interviewee talks about early parent–child relationships. The AAI is interpreted as indicating defensive strategies, and more emphasis is placed on discourse properties (e.g. coherence, anger, believability) than on the propositional content of what is said. Moreover, unlike the self-report measures used by social psychologists, the AAI is designed to measure working models of early child–parent relationships, not attachment-related feelings and behaviors in adolescent and adult close relationships, such as romantic or marital relationships.

Despite the substantial differences in focus (parent–child vs. adult–adult relationships) and method (intensively coded interview transcripts vs. brief self-reports), self-report measures of attachment in close relationships are related to the AAI coding scales. In a study of over 100 married women, for example, Shaver, Belsky et al. (2000) found that two self-report scales similar to Brennan et al.'s (1998) avoidance scale (i.e. the comfort-with-closeness and the dependence scales constructed by Collins & Read,

1990) could be predicted from AAI coding scales with multiple Rs of .48 and .52. Interestingly, the most heavily weighted predictor was 'coherence of mind' ($\beta = .40$), the essence of AAI security. The anxiety dimension was predictable with an R of .30, due mainly to the AAI coding scale assessing whether or not the father was portrayed as loving. Analyses running in the other direction revealed that every AAI coding scale except one was predictable from self-report items. For example, the R for predicting 'coherence of mind' was .40, and one of the major predictors was the item 'I am not sure that I can always depend on others to be there when I need them', which was theoretically crucial. We mention these associations not to imply that scores on the two kinds of measures are identical in meaning, which they most certainly are not, but to show that both are related in sensible ways to shared central concepts of attachment theory.

An important difference between common impressions of the two kinds of measures is that the AAI is thought to provide a fairly direct window onto attachment-related unconscious processes, whereas the self-report measures are assumed not to do so. This understandable impression is misleading. Social psychologists and others who use self-report measures view them as convenient surface indicators of differences in attachment-related cognitions, emotions, and behavioral tendencies which are partly unconscious, indicators that can be examined *in relation to more direct measures of unconscious processes* to see whether those processes work the way attachment theory leads us to expect.

ATTACHMENT STYLES AND AFFECT-REGULATION

What has been learned about the secure attachment style?

Research using self-report measures of attachment style has provided considerable insight into secure individuals' affect-regulation strategies, and has supported Bowlby's and Ainsworth's ideas about the importance of a person's having a 'secure base' when confronting threats and stressors. According to Bowlby (1973), positive interactions with available and responsive attachment figures in times of need foster an individual's sense of attachment security, which consists of positive expectations about others' availability in threatening situations; positive views of the self as competent, loved, and valued; and increased confidence in the seeking of proximity and support as effective ways of regulating distress. Specifically, during positive interactions with attachment figures, secure individuals (i.e. those reporting a secure style in response to a typological measure or scoring relatively low on both the anxiety and avoidance dimensions of the multi-item measures) are thought to have learned that distress is manageable and external obstacles can be overcome. Moreover, they have presumably learned about others' good intentions (Hazan & Shaver, 1987) and about the control that can be exerted over the course and outcome of threatening events. As a result, secure individuals are likely to have developed optimistic beliefs about distress management, a sense of trust in others' responsiveness, and a sense of self-efficacy in dealing with stress (Shaver & Hazan, 1993).

According to Bowlby (1969/1982, 1973), adults with a secure attachment history have found on many occasions that maintaining proximity to attachment figures results in protection, support, and relief of distress. They are therefore especially likely to turn to others when threatened with danger or distress and follow the rules

embodied in what H. Waters, Rodriguez, and Ridgeway (1998) called the 'secure base script'. This hypothetical script is organized around three main affect-regulatory tendencies: acknowledgment and display of distress, engagement in instrumental problem-solving, and support-seeking. Secure individuals have presumably learned during their positive interactions with attachment figures that acknowledgment and display of distress will elicit positive responses from others. They have also learned that their own actions are often able to reduce distress and remove problems and obstacles, and that seeking support from others is an effective means of coping.

Bowlby's (1973) hypothesis that securely attached people hold positive and optimistic beliefs when encountering threatening situations has received strong support in numerous social psychological studies using self-report measures of attachment style and assessing a person's cognitive appraisal of real-life stressors. Specifically, relatively secure individuals, as identified by self-report measures, have consistently been found to appraise a wide variety of stressful events in less threatening terms than insecure people, either anxious or avoidant, and to hold more optimistic expectations about their ability to cope with the sources of distress (e.g. Berant, Mikulincer, & Florian, 2001a, 2001b; Birnbaum, Orr, Mikulincer, & Florian, 1997; Mikulincer & Florian, 1995, 1999; Radecki-Bush, Farrell, & Bush, 1993). For example, Berant et al. (2001a, 2001b) found that securely attached mothers of infants who were diagnosed with congenital heart disease reported more positive appraisals of motherhood-related tasks immediately after the diagnosis and one year later as compared with the appraisals of more anxious or avoidant mothers.

There is also extensive evidence supporting the hypothesis that a sense of attachment security is associated with acknowledgment and display of emotions. With regard to the acknowledgment of emotions, Mikulincer and Orbach (1995) used a biographical memory task, in which participants were asked to recall specific, early instances of anger, sadness, and anxiety. People who classified themselves as securely attached had ready access to these painful memories and were able to re-experience some of the accompanying negative affect. For these secure individuals, however, one emotional memory did not spread automatically and uncontrollably to other, unrelated negative emotional memories, as was the case with anxious individuals (see below). The findings suggest that secure individuals have access to unpleasant emotional memories without being overwhelmed by them, a pattern of findings parallel to results obtained with the AAI (Hesse, 1999).

With regard to the display of emotions, both correlational and experimental studies using either self-report or behavioral measures of self-disclosure have shown that secure people are likely to disclose personal information and feelings toward significant others and express their emotions in a relatively open way (e.g. Collins & Read, 1990; Keelan, Dion, & Dion, 1998; Mikulincer & Nachshon, 1991). For example, Mikulincer and Nachson (1991, Study 3) content-analyzed participants' face-to-face verbal disclosures of personal information during dyadic conversations in a laboratory and found that secure individuals disclosed more intimate and emotion-laden information than avoidant individuals.

Social psychological studies have also provided extensive support for Bowlby's (1973, 1988) idea that attachment security is related to the adoption of support-seeking as an affect-regulation strategy for dealing with distressing situations. Researchers who have assessed adults' self-reported tendency to seek support in times of need have consistently found a positive association between this tendency and self-reported secure attachment (e.g. Larose, Bernier, Soucy, & Duchesne, 1999; Ognibene & Collins, 1998;

Wallace & Vaux, 1993). Similar findings have emerged from studies examining self-reported reactions to a specific stressor, such as the Scud missile attacks on Israel during the Gulf War. (For a variety of examples, see Berant et al., 2001a, 2001b; Birnbaum et al., 1997; Mikulincer & Florian, 1995, 1999; Mikulincer, Forian, & Weller, 1993; Radecki-Bush et al., 1993.)

More important, a positive association between self-reports of attachment security and support-seeking has also been observed in studies examining actual support-seeking behavior in stressful naturalistic and laboratory situations (Fraley & Shaver, 1998; Rholes, Simpson, & Grich-Stevens, 1998; Simpson, Rholes, & Nelligan, 1992). For example, Simpson, Rholes, and Nelligan (1992) and Rholes et al. (1998) told participants they would be exposed to a painful, frightening procedure, and the researchers then coded participants' actual behavior while interacting with their romantic partner. Secure participants, as compared with insecure ones, exhibited little hesitation in seeking their steady dating partner's proximity and more explicitly sought comfort and reassurance from their partner. These results were replicated in a study of dating and married partners who were separating at an airport (Fraley & Shaver, 1998). There was a general increase in anxiety, contact-seeking, and contact-maintaining behavior when couple members were about to separate, and secure individuals were more likely than their avoidant counterparts to exhibit these behaviors.

A recent series of studies dealing with attachment-style differences in the way people deal with concerns about their own death – one of the most fundamental and universal sources of threat and anxiety (Becker, 1973) – also support Bowlby's hypothesis that secure individuals rely on proximity-seeking and social interaction to protect themselves from extreme distress. Mikulincer and Florian (2000, Study 5) reported that secure individuals, as compared with insecure ones, reacted to experimentally induced death reminders (e.g. asking participants to write about their thoughts and feelings concerning what it will be like to die) by reporting a higher desire for intimacy with a romantic partner. Taubman Ben-Ari, Findler, and Mikulincer (in press) found that death reminders led secure individuals to be more willing to engage in social interaction, appraise their interpersonal competence in more positive terms, and report fewer worries about rejection. Importantly, these effects of mortality salience did not appear among insecurely attached persons, who instead reacted by becoming more hostile toward people who threatened their cultural world-view (Mikulincer & Florian, 2000, Study 1).

Bowlby's hypothesis that attachment security is associated with constructive, problem-focused methods of coping has also received strong support in many studies. For example, self-reports of attachment security are associated with reliance on problem-solving strategies for coping with a wide variety of personal and interpersonal stressors (e.g. Birnbaum et al., 1997; Lussier, Sabourin, & Turgeon, 1997; Mikulincer & Florian, 1998). Moreover, people who classify themselves as securely attached have been found to deal with interpersonal conflicts in close relationships by compromising and integrating their own and their partner's positions (e.g. Carnelley, Pietromonaco, & Jaffe, 1994; Levy & Davis, 1988; Pistole, 1989) as well as openly discussing the problem and resolving the conflict (e.g. Scharfe & Bartholomew, 1995; Simpson, Rholes, & Phillips, 1996). In studying reactions to experimentally induced reminders of death, Mikulincer and Florian (2000, Study 4) found that secure individuals reacted with a heightened desire for symbolic immortality – a transformational coping 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 he or she dies.

Secure individuals' constructive approach to affect-regulation was also illustrated in Mikulincer's (1998a) research on the experience of anger. In a series of three studies, he found that secure participants' experience of anger resembles what Bowlby (1973) called the 'anger of hope' (i.e. anger intended to rectify an undesirable relationship situation) and seemed to correspond with the rules of the secure base script. Secure individuals tended to acknowledge physiological signs of anger, adopt constructive goals aimed at repairing the relationship with the instigator of anger, engage in adaptive problem-solving, and express anger outward in a controlled and non-hostile manner. That is, for secure individuals, becoming angry seems generally to result in reparative actions on the part of a transgressor and restoration of the relationship. These results are compatible with Bowlby's (1973) idea that anger can be a functional protest reaction to other people's negative behavior and can be used instrumentally to overcome relational obstructions.

Beyond testing Bowlby's basic hypotheses about secure individuals' strategies of affect-regulation, social psychological studies have revealed other characteristics of these strategies that can refine and broaden his conceptualization of attachment security. For example, following Bowlby's (1973, 1988) reasoning, Mikulincer (1997) found that secure attachment is associated with a variety of reality-attuned affect-regulation strategies. Secure persons' confidence in their skilled regulation of distress may allow them to open themselves to new, even threatening, information, and then to develop suitable strategies for dealing realistically with environmental demands. Moreover, their experience of attachment figures as approving may allow them to revise erroneous beliefs without fear of criticism or rejection and thus avoid the cognitive entrapment that results from being unable to revise beliefs. In support of this proposition, secure individuals, as identified by self-report measures and as compared with relatively insecure individuals, have exhibited high levels of cognitive openness and have readily revised faulty knowledge in the face of new evidence (Green & Campbell, 2000; Green-Hennessy & Reis, 1998; Mikulincer, 1997; Mikulincer & Arad, 1999).

The high-level functioning of secure individuals' attachment systems makes it less necessary for them to rely on defensive maneuvers that distort perceptions and self-appraisals, and generate negative reactions to others. Studies have shown that self-reports of attachment security are inversely associated with defensive distortions of self-views and appraisals of self–other similarity in threatening contexts (Mikulincer, 1998b; Mikulincer, Orbach, & Iavnieli, 1998) and inversely associated with the use of reality-distorting projective mechanisms in person perception (Mikulincer & Horesh, 1999; see details below). Moreover, self-reports of attachment security, as well as experimental induction of a sense of security, inhibit maladaptive coping strategies (Pierce & Lydon, 1998), reduce hostile responses to outgroups (Mikulincer & Shaver, 2001), and promote compassionate reactions to others' needs (Mikulincer, Florian, Birnbaum, et al., 2002).

For example, Mikulincer and Shaver (2001) used three different experimental priming techniques – subliminal presentation of security-related words such as love, proximity, and support; guided imagery concerning the components of the secure base script; and visualization of the faces of actual attachment figures – to heighten momentarily the sense of attachment-security. These manipulations eliminated hostile responses to a variety of outgroups (as defined by secular Israeli Jewish students):

Israeli Arabs, ultra-Orthodox Jews, Russian immigrants, and homosexuals. These effects were found even when study participants were led to believe they had failed on a cognitive task or their national group had been insulted by an outgroup member. Our findings clearly demonstrate that activation of the sense of having a secure base can occur unconsciously and can automatically affect social judgments and behavioral intentions.

What has been learned about people with insecure attachment styles?

Besides delineating the affect-regulation strategies of securely attached individuals, studies based on self-reports of attachment style have provided important information about the *hyperactivation* and *deactivation* strategies embodied in insecure individuals' defensive processes (Cassidy & Kobak, 1988; Kobak, Cole, Ferenz-Gillies, Fleming, & Gamble, 1993; Main, 1990). According to Cassidy and Kobak (1988), hyperactivation of the attachment system is characteristic of preoccupied people (in our terms, people who score high on the anxiety dimension of self-report attachment measures), whereas defensive deactivation of the attachment system is characteristic of people with a dismissing orientation (people who score high on the avoidance dimension of self-report attachment measures). Hyperactivation is indicated by recurrent attempts to minimize distance from attachment figures and elicit their support and love through clinging and controlling responses. It is also indicated by a hypervigilant, anxious attentional focus on attachment figures and relationships, hyperactivation of negative emotions and thoughts, and failure to detach from psychological pain. In contrast, deactivation consists of attempts to maximize the distance from attachment figures, to avoid interdependence, to strive for self-reliance and control, to suppress distressing thoughts, and to repress painful memories.

Although these two strategies have been well described by researchers in the AAI tradition (e.g. Hesse, 1999; Kobak et al., 1993; Main, 1995), based on the rich narrative evidence of conflicts and defenses in the interview transcripts they have collected, these researchers have not systematically determined whether their rich narrative material is linked to cognitive, affective, and behavioral reactions to the kinds of threatening situations that should activate the attachment system. Moreover, they have not generally used their measure in experimental studies designed to examine the causal dynamics of attachment-system functioning. In contrast, although in social psychological studies of attachment there is rarely an attempt to measure unconscious processes directly while assessing attachment style with self-report scales, scores on these scales are examined in relation to cognitive, affective, and behavioral reactions in a wide variety of real-world and laboratory situations. This approach has begun to reveal fascinating details about the nature, functioning, and dynamics of hyperactivating and deactivating strategies.

Studies examining attachment-style differences in strategies for coping with stressful events have provided extensive evidence about the regulatory strategies of anxious and avoidant individuals (see Mikulincer & Florian, 1998, 2001, for reviews). On the one hand, people who score high on the attachment-anxiety dimension tend to focus on their own distress, ruminate on negative thoughts, and adopt emotion-focused coping strategies which exacerbate rather than diminish distress (e.g. Birnbaum et al., 1997; Mikulincer & Florian, 1995; Pistole, 1995). On the other hand, people who score high on the avoidance dimension distance themselves cognitively or behaviorally from the source of distress (e.g. Birnbaum et al., 1997; Mikulincer, Florian, & Weller, 1993;

Mikulincer & Florian, 1995, 1999; Radecki-Bush et al., 1993). Nevertheless, the dissociation between their conscious claims and their unconscious dynamics can be measured. Mikulincer, Florian, and Tolmacz (1990) found, for example, that whereas avoidant individuals reported relatively low levels of conscious death anxiety, they exhibited high death anxiety on a TAT story measure. These patterns of coping have been observed with respect both to attachment-related sources of distress (e.g. the process of divorce, the diagnosis of an offspring's cardiac disorder) and to attachment-unrelated sources (e.g. missile attacks on Israeli cities during the Gulf War, combat military training).

The two different insecure regulatory strategies have been observed in reaction to separation reminders (e.g. asking people to imagine vividly their being separated from a loved one). With regard to anxious persons, Mikulincer, Florian, Birnbaum, and Malishkewitz (2002) consistently found that inability to maintain proximity to a relationship partner, which reflects a failure of anxious individuals' hyperactivation strategy, is so catastrophic for them that it is unconsciously equated with personal death. That is, people who scored high on a self-report measure of 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.) Regarding avoidant individuals, Fraley and Shaver (1997) provided strong evidence of deactivation strategies for dealing with separation reminders. When asked to think vividly about a breakup with their long-term romantic partner and then to *stop* thinking about that possibility, more avoidant individuals were better able than less avoidant individuals not only to stop thinking about it, but also to lower the level of their autonomic response to breaking up. In a subsequent series of studies based on an analysis of forgetting curves for attachment- and loss-related information over time, Fraley, Garner, and Shaver (2000) concluded that avoidant individuals' distancing from distress-eliciting material is achieved by diverting attention and inhibiting deep, elaborate encoding of information rather than by actively repressing it from memory. In other words, one regulatory strategy used by avoidant people is to hold distressing material out of awareness and memory right from the start.

Mikulincer and Orbach's (1995) study of autobiographical memories provided additional information about the hyperactivation and deactivation strategies of insecure individuals. Whereas people who endorsed an avoidant attachment style exhibited the lowest accessibility (highest recall time) of memories of sadness and anxiety, those who endorsed an anxious style exhibited the greatest access to these painful memories. In addition, whereas 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, anxious persons reported experiencing very intense dominant *and* non-dominant emotions. It seems that avoidant individuals' reliance on deactivation strategies reduces the accessibility of negative memories, and the emotions they do recall are somewhat shallow psychologically. This may be an example of what Bowlby (1980) and George and West (2001) called 'segregated' mental systems, which are thought to be due to defensive exclusion of painful memories. In contrast, due to their reliance on hyperactivation strategies, anxious individuals have ready access to negative memories and emotions, and seem to have difficulty controlling the automatic spread of activation from one memory with a particular negative emotional tone to other, different negative emotions, which suggests the existence of an undifferentiated, chaotic

emotional architecture. This is one form of what Main and her colleagues (1985) called 'incoherence of mind'.

The different regulatory strategies of anxious and avoidant individuals are well illustrated by Mikulincer's (1998a) study of anger, mentioned earlier. Anxious individuals were prone to strong anger, ruminated excessively on angry feelings, easily remembered angry experiences, and tended to appraise ambiguous stimuli as hostile. As a result, they experienced anger as an interfering emotion that could overwhelm their cognitive systems and draw resources away from adaptive coping. In contrast, avoidant individuals exhibited what Mikulincer (1998a) labeled 'dissociated anger'. Although these individuals did not report intense anger, they exhibited intense physiological signs of distress, reported intense hostility, and displayed an undifferentiated tendency to attribute hostility to partners. This dissociated stance was also manifest in avoidant individuals' reports of escapist responses in dealing with anger, which dampened the conscious experience of anger without solving anger-eliciting problems. Mikulincer (1998a) concluded that avoidant persons were unaware of their anger, burdened by paranoid suspicions and hostile attitudes, and unable to reduce tension. This conclusion is supported by the discovery noted by Rholes, Simpson, and Orina (1999): that people scoring high on attachment avoidance displayed more hostile behavior toward a romantic partner in a laboratory threat context, as coded by trained observers, than people scoring low on avoidance, and that this hostility was particularly strong when the partner was distressed or sought support.

Studies conducted by Mikulincer (1998b) and Mikulincer, Orbach, and Iavnieli (1998) have shown that hyperactivation and deactivation strategies also underlie attachment-style differences in working models of self and others. Bowlby (1988) noted that working models do not consist solely of directly internalized experiences with attachment figures, but also contain a set of regulatory rules that can defensively bias the appraisal of self and others. Following this analysis, Mikulincer and colleagues reasoned that hyperactivating and deactivating strategies are likely to bias insecure individuals' appraisals of self and others, and that this defensive bias would be observed mainly in threatening situations that activate the attachment system.

In several studies, participants were exposed to various experimentally induced threatening or neutral situations, and appraisals of self and others were assessed using self-report scales and other subtler cognitive techniques, such as reaction times for trait recognition (Mikulincer, 1998b; Mikulincer, Orbach, & Iavnieli, 1998). Avoidant individuals reacted to the threatening situations by inflating their positive self-views and perceiving other people as different from themselves. These defensive responses seemed to be part of a deactivating strategy: Whereas avoidant individuals' regulatory attempts to suppress personal deficiencies favored self-inflation, their attempts to maximize distance from others resulted in under-estimation of self–other similarity. In contrast, anxious individuals tended to react to threatening situations by devaluing themselves while perceiving other people as similar to them. This defensive pattern seemed to be part of a hyperactivating strategy: exaggeration of personal weaknesses while attempting to elicit others' compassion and support promoted self-devaluation, whereas attempting to create an illusion of connectedness results in heightened self–other similarity.

These findings imply that the way insecure people perceive others is biased by their regulatory strategies. On the one hand, avoidant individuals' perception of others may be guided by their preference for distance and a desire to view themselves more positively than others. On the other hand, anxious individuals' perception of others may

be guided by their search for connectedness and may be assimilated to their own negative self-views.

Following this line of reasoning, Mikulincer and Horesh (1999) hypothesized that avoidant individuals' perception of others would be colored by defensive projection of their own unwanted traits (unwanted-self traits). In particular, avoidant persons were expected to project unwanted-self traits onto others, thereby increasing self–other differentiation and, by comparison, enhancing their sense of self-worth. Mikulincer and Horesh (1999) also hypothesized that anxious individuals' perception of others would be influenced by projection of actual-self traits onto others, which would have the effects of increasing self–other similarity and enhancing the sense of closeness. These hypotheses were examined in three two-session studies. In the first session, participants reported on their attachment style and 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 – that is, whether (1) avoidant people's responses were affected by projection of unwanted-self traits and (2) anxious people's responses reflected the projection of actual-self traits.

The findings indicated that avoidant individuals were likely to perceive in others the traits included in their own unwanted self, easily to retrieve an example of a known person whose traits resembled those of their unwanted self, and to 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. These findings suggest that avoidant individuals' perceptions of others are affected by *defensive projection* (A. Freud, 1936; S. Freud, 1957[1915]), which is a byproduct of the defensive exclusion of negative information about the self and of attempts to maintain interpersonal distance. With regard to anxious individuals, the studies supported the hypothesis that they would project traits of their actual self onto others. They were in fact likely to perceive in an unknown person traits characterizing 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 what Klein (1940) called *projective identification* influences anxious individuals' perception of others, which may result from hyperactivation of the attachment system and an intense search for connectedness. This conclusion fits with Bion's (1970) and Ogden's (1990) contention that projective identification reflects a search for connectedness and acts as a defense against the threat of separation and loss.

The dynamics of hyperactivating and deactivating strategies have also been observed in Mikulincer's and Sheffi's (2000) study of attachment-style differences in cognitive reactions to the experimental induction of positive affect. Across three studies, participants were exposed to positive affect inductions (e.g. asking them to retrieve a happy personal memory or exposing them to a brief comedy film) and then performed cognitive tasks assessing creative problem-solving and the breadth of mental categorization. Findings revealed that the frequently documented beneficial effects of positive affect inductions on creative problem-solving and category breadth (reported, for example, by Isen & Daubman, 1984, and Isen, Daubman, & Nowicki, 1987) were observed only among people who endorsed a secure attachment style. For people who

endorsed an avoidant style, no significant difference was found between positive-affect induction and neutral conditions. For people with an anxious style, a reverse effect was found which resembled the typical effects of negative affect induction. Specifically, anxious individuals reacted to a positive affect induction with impaired creativity and a narrowing of mental categories.

The findings for avoidant individuals may reflect their habitual deactivating strategy, which causes them to inhibit emotions and regard them as irrelevant to cognitive processing. Perhaps their attempt to deactivate negative emotions causes them to distance themselves from positive emotions as well. Moreover, their defensive tendency to block cognitive exploration and unusual thoughts and resist the incorporation of new evidence may make them reluctant to open their cognitive structures even when a positive affective cue implies that they could let their guard down. In any case, avoidant people seem to pay a heavy price for deactivating emotion: they miss the opportunity to benefit cognitively from situations that normally elicit positive feelings.

Anxious individuals may interpret positive affect as a danger cue because in the past it caused them to let their guard down, with painful or dangerous consequences. According to Bowlby (1988), one of the antecedents of the anxious style is the failure of attachment figures to provide a secure base for exploration and to alleviate distress when exploration becomes threatening. As a result, anxious individuals may exaggerate the potential threats involved in playful exploration and have serious doubts about their ability to deal with these threats. Painful experiences may cause anxious people to adopt a rigid, hyper-vigilant attitude toward novelty and uncertainty, and to perceive themselves as vulnerable and helpless whenever they let their guard down. As a result, positive affect, which normally signals that 'all is going well' and favors open cognitive strategies, may be perceived as a danger cue. It is also possible that the spread of activation across *negative* emotions observed by Mikulincer and Orbach (1995) can begin with *positive* affect. That is, an anxious person may initially experience a positive state, in line with the experimental induction, but then be reminded of the down-side of previous experiences that began positively and ended painfully. Once attuned to the negative memories and possibilities, the anxious mind may become lost in a flood of negative associations that interferes with creative and flexible cognitive processing.

Summary

Summarizing this plentiful research on individual differences in attachment-related mental processes, we can see that studies using self-report measures of attachment style are quite capable of testing Bowlby's and Ainsworth's ideas about attachment security and testing clinical observations concerning the hyperactivating and deactivating strategies employed by insecure people. Moreover, these studies broaden and refine previous ideas and observations, including ideas concerning unconscious processes.

Individuals with a secure attachment style – i.e. those who score low on both the anxiety and avoidance dimensions – function very much as Bowlby's and Ainsworth's writings lead us to expect. They are less threatened by potentially distressing information; they can experience, express, and verbally self-disclose emotions, but they do not become lost in an accelerating spiral of negative memories and worries. They seek support when under stress and use constructive means of coping; they feel comfortable exploring new stimuli and are less hostile to outgroup members and more empathic toward people in need. Avoidant individuals as identified by self-report

questionnaires exhibit a variety of effects compatible with the notion of deactivating strategies, including defensive exclusion of painful thoughts and memories, segregation of mental systems, and dissociation between conscious and unconscious levels of responding. Thus, although attachment questionnaires do not ask respondents about their unconscious processes, people who score high on self-report measures of avoidant attachment also exhibit defensive projection, fail to notice or acknowledge their own hostility, and consciously deny death anxiety that is nevertheless revealed by projective TAT measures. Finally, anxious individuals identified by self-report questionnaires exhibit a variety of effects compatible with the notion of hyperactivating strategies, including projective identification, ready access to painful memories, automatic spread of negative emotion from one remembered incident to another, and paradoxical cognitive closure in response to a positive affect induction. Their inability to regulate negative emotional memories is compatible with the behavior of preoccupied individuals in the AAI; they often become incoherently lost in negative emotional memories and have to ask the interviewer, 'What was the question again?'

In short, individuals identified as having different attachment styles also exhibit a remarkable variety of psychological differences compatible both with the scoring of the AAI and with attachment theory. The use of a wide variety of measures and experimental procedures allows researchers to manipulate and capture psychodynamic processes that might be difficult to pin down solely with the use of clinical interviews.

THE DYNAMICS OF ATTACHMENT-SYSTEM ACTIVATION

Normative functioning of the attachment system

In describing the normative functioning of the attachment system – i.e. the general, universal aspects of the system, aside from the individual differences we have discussed so far – Bowlby (1969/1982, p. 307) listed some of the major contextual triggers that activate the system. In his words: 'A child seeks his attachment figure when he is tired, hungry, ill, or alarmed and also when he is uncertain of that figure's whereabouts.' In other words, Bowlby proposed that encounters with physical or psychological threats automatically activate the attachment system. As a result, the individual is driven to maintain or restore proximity to relationship partners who can provide support and thereby help to manage distress. Under normal circumstances, this activation is manifested in the actual seeking of proximity or support.

This conceptualization of attachment-system activation has been extensively supported in studies of infants and young children. In times of need, infants show a clear preference for their primary caregiver and engage in proximity-seeking behaviors (e.g. Ainsworth, 1973; Brooks & Lewis, 1974). Specifically, when tired or ill, infants tend to seek and maintain proximity to their primary caregiver (e.g. Ainsworth, 1973, 1991) and to be soothed by this person's presence (e.g. Heinicke & Westheimer, 1966). Conceptually parallel research with adults has shown that separation from romantic partners is an important source of distress in adulthood (e.g. Fraley & Shaver, 1998; Vormbrock, 1993). For example, feelings of anxiety, anger, and sadness have been noted following brief separations (e.g. Vormbrock, 1993) as well as following divorce or the death of a spouse (e.g. Birnbaum et al., 1997; Fraley & Shaver, 1999; Stroebe & Stroebe, 1993). Moreover, asking people to *imagine* their romantic partner's leaving

them heightens physiological arousal (Fraley & Shaver, 1997) and increases the accessibility of death-related thoughts (Mikulincer, Florian, et al., 2002).

In a recent series of studies, Mikulincer, Birnbaum, Woddis, and Nachmias (2000) attempted to directly test Bowlby's (1969/1982) hypothesis about attachment-system activation while assessing the cognitive accessibility of thoughts about attachment figures – i.e. the readiness of these cognitive elements to be used in information-processing and behavior – in threatening contexts. This strategy is based on the notion that a thought or concept can become neurologically active and influence mental processes before it is recognized in one's stream of consciousness (Wegner & Smart, 1997). In other words, the extent to which a thought influences performance on a cognitive task can serve as a measure of activation.

In Mikulincer et al.'s (2000) studies, participants reported on their attachment style, after which the accessibility of proximity themes was assessed in a lexical decision task following priming with a threat-related or neutral word. Lexical decision tasks require participants to indicate by pressing a button or computer key whether a string of letters is or is not a word. Priming is accomplished by exposing threat-related words subliminally for very brief periods of time (less than 20 milliseconds). Findings supported Bowlby's (1969/1982) 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). Importantly, this effect was specific to proximity-related words and did not occur in response to positive affect words that had no attachment connotation. Moreover, this heightened accessibility of proximity-related thoughts occurred regardless of individual variations in attachment style, suggesting, as expected, that everyone experiences attachment-system activation.

Although Mikulincer et al.'s (2000) studies provided the first direct examination of the cognitive substrate of attachment-system activation in adults, they did not provide evidence concerning the accessibility of mental representations of attachment figures. In fact, attachment-system activation entails not only the accessibility of proximity-related thoughts, but also the focusing of these thoughts on specific attachment figures. That is, thoughts about love, support, and closeness should be associated with, or directed toward, significant others who serve proximity-seeking, safe haven, and/or secure base functions. Therefore, showing that proximity-related thoughts are accessible under conditions of threat is an important but insufficient step in testing Bowlby's (1969/1982) ideas about attachment-system activation.

To provide a more direct test of this hypothesis, Mikulincer, Gillath, and Shaver (in press) conducted three experimental studies focused on the accessibility of the names of people whom participants listed as serving proximity-seeking, safe haven, and/or secure base functions. This accessibility was examined in threat-related contexts. Study participants completed avoidance and anxiety scales (Brennan et al., 1998); filled out the WHOTO scale (Hazan & Zeifman, 1994; see also Fraley & Davis, 1997), which identifies the names of people who serve as attachment figures under various conditions; and provided names of close others who were not mentioned in the WHOTO scale, names of people whom a participant knew even though he or she was not close to them and did not view them as attachment figures (known persons), and names of unknown persons. Participants then performed either a lexical decision task or a Stroop color-naming task, providing multiple indicators of the accessibility (reaction times, or RTs) of representations of attachment figures, close persons, known persons, and unknown persons immediately after subliminal presentation of either a threat-prime word (failure, separation) or a neutral word (hat, umbrella).

The findings consistently showed that unconsciously presented threatening words automatically activated cognitive representations of attachment figures. Across the three studies, participants reacted to threat contexts with heightened accessibility of the names of the people listed on the WHOTO scale as serving attachment functions. As compared with subliminal priming by neutral words (e.g. table), the subliminal priming by threat words led to (1) faster identification of names of attachment figures in the lexical decision task and (2) 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.

Importantly, the priming of threat words increased the accessibility of representations of attachment figures but had no effect on representations of close others who did not serve attachment functions, representations of known persons, and representations of unknown persons. Thus, it seems that heightened accessibility under threatening conditions depends on the extent to which a person is viewed as a safe haven, secure base, and/or target of proximity-seeking. Moreover, the accessibility of representations of attachment figures was not restricted to the priming of a specific kind of threat word (related vs. unrelated to attachment). Rather, it occurred both when an attachment-unrelated (failure) and an attachment-related (separation) threat word was primed, which indicates that even a threatening context that is unrelated to attachment themes can heighten the accessibility of representations of attachment figures.

Our findings suggest that there are universal, normative features of the attachment behavioral system. When threatened (even unconsciously) the adult mind turns automatically to representations of attachment figures. Presumably, this is the first step in a process that often results in actually searching for these figures and increasing physical and/or psychological proximity to them. These findings provide support for the protective function of the attachment system, delineate its cognitive substrate, and increase our confidence in the psychological reality of the system. The studies are important in part because they show how core ideas in attachment theory can be tested regardless of how one conceptualizes and measures individual differences in attachment styles or states of mind. The growing literature on attachment-system activation should prove interesting to attachment researchers of all persuasions.

Despite normative processes, however, there is also very interesting evidence concerning individual differences in the activation, inhibition, and dynamics of the attachment behavioral system. This evidence, which is reviewed in the following section, is particularly important for delineating the psychodynamic mechanisms underlying attachment anxiety and attachment avoidance.

Individual differences in attachment-system activation

In the priming studies described above, there were a number of important but as yet unmentioned results regarding individual differences in attachment style. Secure 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, Birnbaum, et al., 2000; Mikulincer, Gillath, et al., in press). These findings imply that secure individuals' cognitive systems are not chronically preoccupied with attachment themes or attachment figures, and that attachment-related representations may not influence behavior in all situations. Rather,

attachment-related cognitions seem to be adaptively activated when a transaction requires that some coping action be taken. Also important is the fact that secure individuals' reactions to stress primes were limited to attachment themes with positive affective connotations. Mikulincer, Birnbaum, et al. (2000) reported that secure individuals had relatively slow access to words connoting proximity-related worries (e.g. separation, rejection) under both neutral and threatening conditions. This pattern of accessibility may reflect secure individuals' positive history of attachment relationships (Shaver & Hazan, 1993). It is possible that this positive history creates distance in semantic memory between activation of the attachment system and worries about rejection or separation.

Overall, the findings for secure individuals indicate that their attachment system operates in a functional way. The system is activated mainly by threats to well-being, and activation is circumscribed to attachment themes with positive affective connotations. Thus, thinking about love and closeness to an attachment figure may lead to a state of anticipated relief and comfort, thereby reducing the distress evoked by a threatening event. This kind of activation may underlie secure individuals' optimistic and hopeful judgments and their tendency to seek support in times of need (Mikulincer & Florian, 1998). In general, the activation of attachment themes in the minds of secure people fits with Bowlby's ideas about the regulatory functions of the attachment system.

Anxious individuals' pattern of accessibility to attachment representations was virtually opposite to that of secure individuals (Mikulincer, Birnbaum, et al., 2000; Mikulincer, Gillath, et al., in press). First, anxious persons exhibited ready access to attachment themes and attachment figures' names *in both stressful and non-stressful contexts*. Second, they had ready access to attachment-related worries (e.g. rejection, abandonment). As in the studies of positive affect induction summarized earlier, activation of the attachment system in the case of anxious individuals is colored by worries about separation and rejection. This high accessibility of proximity-related worries fits with anxious individuals' negative working models of self and world (Bowlby, 1973; Collins & Read, 1990). It may reflect their expectation that the expression of attachment needs will be followed by rejection or unreliable support rather than reliable sensitivity and responsiveness (Shaver & Hazan, 1993). The high accessibility of attachment-related representations even in neutral contexts indicates chronic hyperactivation of the attachment system (Cassidy & Kobak, 1988; Mikulincer & Florian, 1998). Sad to say, thinking about rejection and separation may compound the distress stemming from a stressful event and be a major source of anxious people's chronic distress (Mikulincer & Florian, 1998). Moreover, the cognitive linkage between attachment and rejection may discourage anxious people from expressing feelings and seeking support in times of need (Feeney, 1995, 1999a).

Avoidant individuals yielded an even more complex pattern of findings. In general, their pattern of access to attachment themes resembled that observed among secure persons (Mikulincer, Birnbaum, et al., 2000; Mikulincer, Gillath, et al., in press). However, there were some important differences between secure and avoidant individuals. First, for avoidant persons, attachment-related worries were relatively inaccessible even when the word 'death' was used as a subliminal prime, despite the fact that thoughts of death are usually potent activators of attachment-related fears. Second, the attachment-related worries of avoidant individuals *did* become mentally active in response to threat primes when a 'cognitive load' was added to the lexical decision task (i.e. when study participants had to engage in an additional cognitively

demanding task, perhaps draining mental resources from the defensive exclusion processes normally pursued effectively by avoidant people). Third, although avoidance was not associated with lexical decision RTs for the names of attachment figures when the threatening subliminal prime word was *failure*, scores on the avoidance dimension of Brennan et al.'s (1998) self-report attachment style questionnaire were negatively related to RTs for the names of attachment figures when the subliminal prime word was *separation* – an attachment-related threat that is theoretically central to the creation of avoidance in the first place. Ainsworth et al. (1978) identified the mother's withdrawal of support when her infant expressed neediness, desire for closeness, or vulnerability as a major cause of avoidance in infancy. Although we do not know, or require theoretically, that avoidance as we measure it can be traced back to experiences in early childhood, it is possible that inhibitory neural circuits developed in childhood as a means of attaining a degree of proximity and protection without provoking rejection are still active in adults when the word 'separation' is encountered unconsciously. These circuits may allow avoidant children to maintain some degree of proximity to parents and enjoy some degree of protection and care, without evoking their caregivers' disapproval and distancing (Main & Weston, 1982).

Avoidant individuals' heightened access to attachment themes in threatening contexts provides new and important information about these people's affect-regulatory strategies. It seems that avoidant individuals preconsciously activate attachment themes despite their conscious denial of any need for love and support. This conclusion fits with findings regarding the dissociation in avoidant individuals between self-reports, on the one hand, and physiological and projective responses, on the other (Dozier & Kobak, 1992; Mikulincer, Florian, et al., 1990). It also fits with Bowlby's (1988) theoretical statements concerning avoidant individuals' inability or unwillingness consciously to acknowledge and express feelings of love. It is equally important to note, however, that preconscious activation of the attachment system in avoidant persons is automatically, and very quickly, inhibited in contexts where separation is at issue. In such cases, their 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 natural tendency to seek proximity, which we know they possess, at least in non-attachment-related threatening conditions. Their self-reports of avoidance may be fairly accurate summaries of their behavior in attachment-related situations, even though they have no way of knowing how their attachment system and inhibitory neural networks generate their avoidant behavior.

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 with other attachment classifications, less comfortable with physical contact, less expressive of positive emotion, and less tolerant of their infants' expressions of anxiety, vulnerability, and neediness. Ainsworth et al. (1978, p. 320) said, for example, that '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 repeatedly practiced, it becomes part of a person's automatic, unconscious cognitive processes.

The findings from our recent priming studies suggest that avoidant individuals are good at suppressing proximity-related worries. This fits with Fraley and Shaver's

(1997) observation that avoidant individuals could readily suppress thoughts of separation from their current romantic partner when asked to do so in an experimental setting. Only under conditions of high cognitive load, which may interfere with inhibitory circuits and heighten the accessibility of to-be-suppressed material, do avoidant individuals experience intense activation of attachment-related worries. This discovery may provide a better understanding of prior findings concerning the vulnerability of avoidant people. A number of studies have shown that, although avoidant individuals report adequate levels of well-being and adaptive functioning in daily life, they exhibit high levels of distress and signs of maladjustment in severe and persistently stressful situations (Mikulincer & Florian, 1998). It is possible that the encounter with severe and persistent stress imposes increasing demands on an avoidant person's cognitive system, which in turn heightens the accessibility of proximity-related worries and creates a state of distress that resembles the emotional turmoil of anxiously attached individuals. This distress may eventually lead to serious difficulties. For example, in the Berant et al. (2001b) study described earlier, in which mothers of infants with congenital heart disease were followed for a year following receipt of their child's diagnosis, attachment avoidance at the time of diagnosis was the best predictor of the mother's poor mental health at the end of the study.

AN INTEGRATIVE REPRESENTATION OF THE DYNAMICS OF THE ATTACHMENT SYSTEM

Based on findings from studies using self-report measures, it is possible to create a more complete model of the activation and dynamics of the attachment system. This model integrates recent findings with the earlier theoretical proposals of Bowlby (1969/1982, 1973, 1980), Ainsworth (1991), Cassidy and Kobak (1988), Kobak et al. (1993), and Main (1995) and is a conceptual extension and refinement of previous control-systems representations of the dynamics of the attachment system presented by Shaver, Hazan, and Bradshaw (1988) and Fraley and Shaver (2000). The new model (see Figure 1) includes three major components. One component involves the monitoring and appraisal of threatening and distress-eliciting events; it is responsible for activation of the attachment system. The second component involves the monitoring and appraisal of the availability and responsiveness of attachment figures who could provide support and relief, satisfy attachment needs, build the individual's own inner resources, and broaden his or her thought-action repertoire. This component is responsible for individual differences in the sense of having a secure base. The third component involves the monitoring and appraisal of the viability of proximity-seeking as a means of coping with attachment insecurity and distress. This component is responsible for individual differences in the use of hyperactivating vs. deactivating strategies of affect regulation. The new model also includes excitatory and inhibitory neural circuits (shown as arrows on the left side of the diagram) that result from the recurrent use of hyperactivating or deactivating strategies, which in turn affects the monitoring of threatening events and attachment figures' availability.

Following Bowlby's (1969/1982) reasoning, we assume that the monitoring of events as they unfold will result in activation of the attachment system when a potential or actual threat is sensed. This activation is manifested in cognitive activation of internalized representations of attachment figures and, sometimes, in efforts to seek and/or maintain proximity to them. This part of the model accounts for results
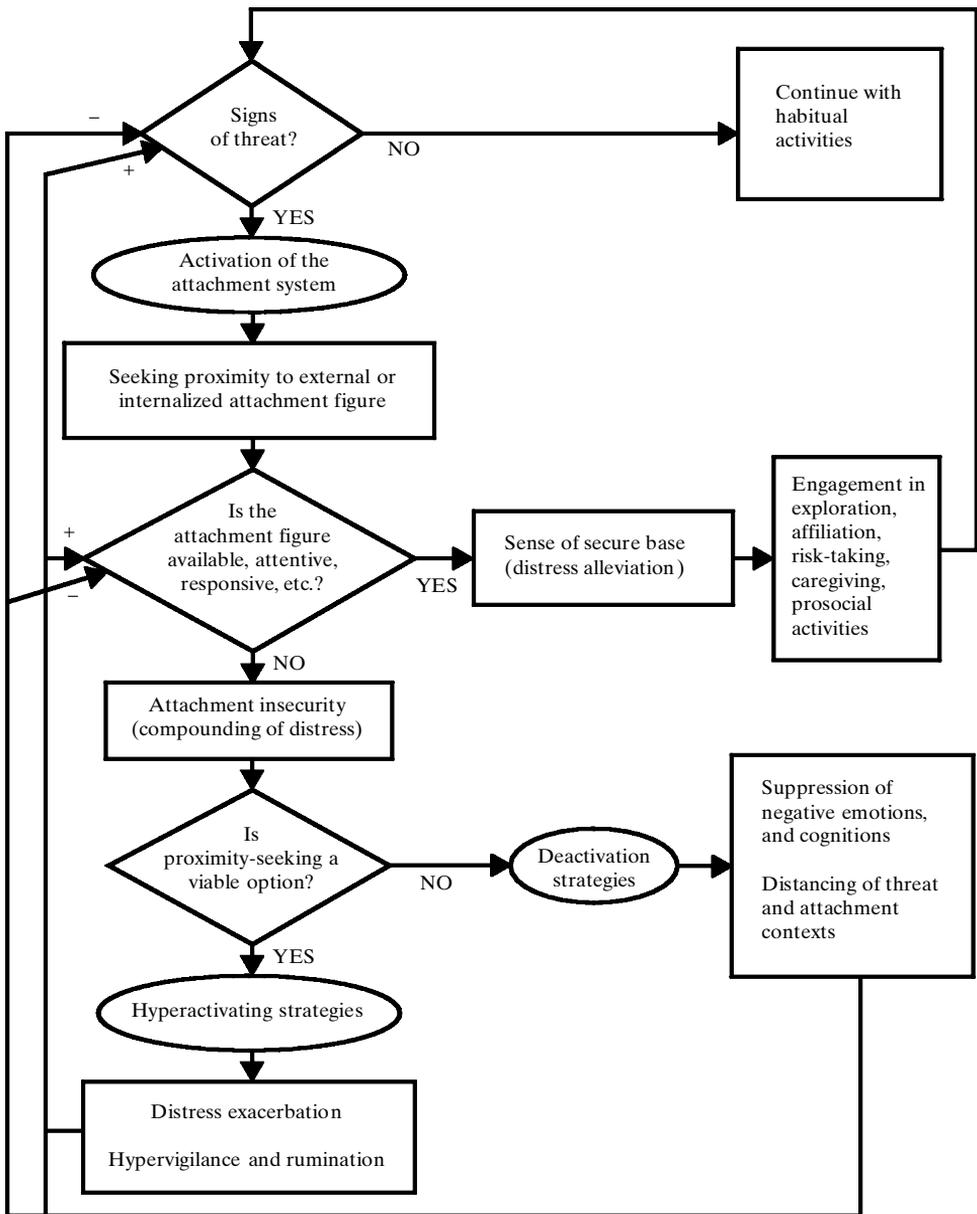
Figure 1 A model of attachment-system activation, hyperactivation, and deactivation

showing that both attachment-related and attachment-unrelated threatening contexts heighten implicit accessibility of mental representations of attachment figures (e.g. Mikulincer, Gillath, et al., in press) as well as explicit proximity-seeking behaviors (e.g. Fraley & Shaver, 1998). Although this component of the model represents the normative working of the attachment system, which occurs regardless of individual differences in attachment history and orientation, it is still affected by excitatory neural circuits resulting from the hyperactivating strategies of anxious persons and inhibitory neural circuits related to avoidant individuals' deactivating strategies.

Whereas the excitatory circuit accounts for anxious people's hypervigilant focus on threat-related cues, their exaggerated appraisal of threats, and chronic activation of their attachment systems even under neutral conditions, the inhibitory circuit accounts for avoidant individuals' dismissal of threat-related cues and suppression of threat-related thoughts and emotions (e.g. Mikulincer & Florian, 1998; Mikulincer, Birnbaum, et al., 2000).

Once a person's attachment system is activated, an affirmative answer to the question about attachment figures' availability (either in the internal representational world or in the outside environment) results in a strong sense of having a secure base and in what we, following Fredrickson (2001), will call a 'broaden and build' cycle of attachment security. This cycle is characterized by distress alleviation and enhanced personal adjustment as well as the facilitation of other behavioral systems, such as exploration, affiliation, and caregiving, which broaden a person's perspectives and capacities. Moreover, this cycle encourages a person to openly acknowledge future threats and stresses and also to rely comfortably on proximity-seeking as a coping strategy. This part of the model accounts for research findings concerning the cognitive, affective, and behavioral correlates of attachment security, and the adaptive activation of secure individuals' attachment systems in threatening contexts.

The perceived unavailability of an attachment figure results in attachment insecurity, or the sense of *not* having a secure base, which compounds the distress initiated by perception of a threatening event. This state of insecurity then forces a decision about the viability of proximity-seeking as a protective strategy. When proximity-seeking is appraised as a viable option, because of attachment history, temperamental factors, or contextual cues, people adopt hyperactivating strategies which are manifested in an approach orientation toward attachment figures and continued vigilance toward threat-related cues. These strategies involve excitatory neural circuits that increase vigilance to threat- and attachment-related cues, and reduce the threshold for detecting threats and cues of attachment figures' unavailability or rejection, thereby exacerbating distress. In this way, a continuing cycle of distress is created, which interferes with cognitive functioning, maintains a sense of pain and distress, and makes it likely that new sources of distress will mingle and become confounded with old ones, which creates a chaotic, undifferentiated mental architecture and incoherent state of mind. These excitatory circuits account for findings concerning the cognitive, affective, and behavioral manifestations of attachment anxiety.

The appraisal of proximity-seeking as not being viable results in the adoption of deactivating strategies, which are manifested in distancing from both the source of distress and from attachment figures and in attempts to handle distress alone by relying on suppressive and repressive mechanisms. These strategies involve inhibitory circuits that lead to the dismissal of threat- and attachment-related cues, the suppression of threat- and attachment-related thoughts and emotions, and the repression of threat- and attachment-related memories. These inhibitory circuits are further reinforced by the adoption of a self-reliant attitude that deters dependence on others and acknowledgment of personal faults or weaknesses. These inhibitory circuits account for findings concerning the cognitive, affective, and behavioral manifestations of attachment avoidance.

Although these inhibitory circuits can be viewed as effective in preventing threat acknowledgment and consequent activation of the attachment system, there are cases in which the circuits fail to achieve these deactivating goals. Such cases include encounters with severe and prolonged sources of distress that people cannot dismiss or deny,

and also subliminal exposure to threat-related cues that bypass the avoidant cognitive shield. In these cases, the attachment system is activated, attachment-related cognitions become accessible, and deactivating strategies are exacerbated in order to inhibit these cognitions. However, when threat acknowledgment cannot be suppressed, as in the case of mothers of infants with severe and life-endangering cardiac disorders (Berant et al., 2001a, 2001b), deactivating strategies are insufficient and the individual is over-whelmed with negative ideation and emotion. This failure of the inhibitory circuits accounts for the breakdown of avoidant individuals' defenses in traumatic situations and also for Bartholomew and Horowitz's (1991) distinction between 'dismissing' and 'fearful' avoidance. Whereas dismissing avoidance involves the adequate functioning of deactivating strategies and inhibition of acknowledging threat-related cues and attachment needs, fearful avoidance may involve the collapse of these strategies under severely stressful conditions. Fearfully avoidant individuals simultaneously *want* closeness to attachment figures but also feel unable to trust and rely on them. This may cause their attachment systems to remain activated while their behavioral strategies suggest deactivation.

It is important to note that all components of the model, including the neural circuits we are postulating, can operate either consciously or unconsciously. Moreover, these components and circuits can operate in either parallel or opposite ways at conscious and unconscious levels. This explains why, for example, some avoidant individuals display conscious deactivation of threat- and attachment-related cues while also exhibiting unconscious and/or physiological signs of distress. It also explains why some avoidant individuals exhibit heightened accessibility of attachment-related worries under cognitively demanding conditions that prevent more controlled inhibition of these worries (Mikulincer, Birnbaum, et al., 2000). Under such conditions, part of the deactivation process is interfered with, and the underlying attachment insecurity shows itself.

CONCLUSIONS: FUTURE DIRECTIONS

Our review of recent research demonstrates that self-report measures of attachment, when combined with a variety of other measures and experimental procedures, produce interesting and coherent findings that fit well with derivations and predictions from attachment theory. Although the self-report measures were not intended to tap unconscious processes directly, individual differences on self-report attachment measures do relate to measurable unconscious processes, including the kinds of defensive processes described by psychoanalytic theorists. We use self-report measures in somewhat the same way that physicians use simple indicators of health and illness – e.g. body temperature measured with a thermometer or verbal reports of insomnia. Although such indicators do not provide direct access to underlying disease processes, they are very helpful in assessing a person's health in a preliminary way. If a particular illness is suspected, there are more complex procedures for confirming it and tracking its course, just as there are additional ways to probe the workings of secure and insecure attachment systems.

The patterns of findings obtained with self-report measures are highly compatible with the contents of AAI transcripts, the issues addressed in the AAI coding system, and findings obtained with the AAI. Thus, the experimental research procedures reviewed here offer a way to bridge the gap between narrative, clinically revealing

attachment measures and the self-report literature on adult attachment. Moreover, because of the range of measures and methods used in the social psychological line of research on attachment, it is possible to probe and refine our understanding of causes, correlates, and consequences of attachment-related processes. To date, there are very few studies using the AAI or other narrative methods, such as Bartholomew's interview (Bartholomew & Horowitz, 1991) or Crowell and Owen's (1996) Current Relationship Interview (CRI), in experimental settings. We therefore know relatively little about links between these interviews and the range of processes and outcomes reviewed in the present article. Moreover, the AAI and CRI are focused entirely on *individual differences* in 'state of mind with respect to attachment' and therefore do not reveal much about the normative workings of the attachment behavioral system. We would like to see more research linking narrative assessments with both self-report measures and experimental procedures that can reveal the causal workings of the attachment system.

Because research using self-report measures is relatively easy to carry out, at least in comparison with conducting and coding hour-long interviews using coding systems that require extensive training to learn, it has been possible to test hypotheses concerning a broad array of consequences and implications of attachment-related processes – in arenas ranging from parenting and couple relationships to empathy, personal values, intergroup relations, and the trauma of war. AAI researchers (e.g. Crowell, Waters, et al., 1996) have tended to emphasize discriminant validity, in order to be sure that measures of attachment are not confounded or redundant with other kinds of measures. Although we are also interested in discriminant validity, and in many cases have controlled statistically for variables that might be confounded or redundant with self-report measures of attachment, such as trait anxiety, neuroticism, the other 'big five' personality traits, and general positive affect, we do not want to narrow or restrict the definitions of attachment-related constructs prematurely. Our reading of Bowlby suggests that he intended attachment theory to be quite broad in its implications. His interest in attachment began with juvenile delinquency, and in the book celebrating his 80th birthday (Parkes, Stevenson-Hinde, & Marris, 1991) there is a chapter by Marris on the relevance of attachment theory for analyzing large-scale social and societal process. Bowlby (1969/1982) included in his theoretical analysis of human behavior several other behavioral systems, such as exploration, caregiving, affiliation, and sexuality, which suggests further avenues for research on the broad implications of the interplay among behavioral systems. Bowlby (1988) portrayed attachment security as a prerequisite for personal growth and development in the areas addressed by the other behavioral systems. We believe we have begun to map some of the clinically important effects of the absence of this important prerequisite.

Despite our wish to make a case for the utility of self-report measures of attachment, and for the value of studies that include a combination of those measures and experimental social-psychological research techniques, we would also like to express genuine interest in and openness to the narrative approach adopted by AAI researchers and to the clinical emphasis inherent in their work (see also Fonagy, 1999; Slade, 1999). Social psychological studies tend to rely on college student samples or community samples of normal adults. It will be important in the future to direct more attention to clinical samples and to analyze the dynamics of attachment-system activation and the consequences of secure-base priming in those populations. Researchers should also examine the role of the normative functioning of the attachment system and individual differences in attachment processes in psychotherapeutic settings. (For an early and

interesting example in the field of marital therapy, see Johnson, 2002.) Moreover, it will be important to use the empirical methods we have outlined here to explore connections between attachment theory and other object relations theories. All of these theories grew out of extensive clinical experience and all emphasize the importance of interpersonal relationships to emotional development and mental health. We (Banai, Mikulincer, & Shaver, under review) recently operationalized some of the key concepts in Kohut's (1971) self-psychology and found that his constructs relate very predictably and systematically to self-reports of attachment anxiety and avoidance. The two theories are concerned with some of the same central issues but are sufficiently different so that each supplements the other in important ways. It is possible to imagine a day, perhaps not so far in the future, when a more comprehensive, clinically rich, and empirically grounded theory of personality development and functioning will be attainable. Such a theory will incorporate the empirically valid insights of Bowlby and other attachment theorists as well as the astute observations of other clinical researchers, and many of its propositions will be amenable to experimental test.

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