

Generalized Anxiety Disorder: Connections With Self-Reported Attachment

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Even though generalized anxiety disorder (GAD) is one of the most common of the anxiety disorders, relatively little is known about its precursors. Bowlby's attachment theory provides a framework within which these precursors can be considered. According to Bowlby, adult anxiety may be rooted in childhood experiences that leave a child uncertain of the availability of a protective figure in times of trouble. Furthermore, adult "current state of mind with respect to attachment" is thought to relate to adult anxiety. Both attachment-related components were assessed with 8 subscales of the Perceptions of Adult Attachment Questionnaire (PAAQ). Clinically severe GAD clients who were about to begin therapy reported experiencing less maternal love in childhood, greater maternal rejection/neglect, and more maternal role-reversal/enmeshment than did control participants. In keeping with a cumulative risk model, risk for GAD increased as indices of poor childhood attachment experience increased. GAD clients, in contrast to controls, also reported greater current vulnerability in relation to their mothers as well as more difficulty accessing childhood memories. Logistic regression analyses revealed that elevations on PAAQ subscales could significantly predict GAD vs. non-GAD status. Results and the implications for advancing the theory and treatment of GAD are discussed.

GENERALIZED ANXIETY DISORDER (GAD) is one of the least studied of the anxiety disorders, despite the fact that epidemiological studies reveal that it is one of the most common (Dugas, 2000; Flannery-Schroeder, 2004; Kessler, Keller, & Wittchen, 2001; Rapee, 1991). GAD is also a frequent additional diagnosis to several other anxiety disorders (Brown & Barlow, 1992; Curry, March, & Hervey, 2004) and contains a central feature (chronic worry) pervasive throughout the anxiety disorders (Barlow, 1988; Mennin, Heimberg, & Turk, 2004). According to *DSM-III-R* and *DSM-IV* criteria (American Psychiatric Association, 1987, 1994), GAD is characterized by the experience of chronic excessive worry over multiple life circumstances.

Borkovec and colleagues (Borkovec, Alcaine, & Behar, 2004) have theorized about the function of pervasive worry in GAD. They have suggested that individuals with GAD avoid experiencing distressing negative emotions (and concurrent autonomic arousal) in the short run through engagement in the abstract, verbal-linguistic process of worry. In essence, individuals with GAD distance themselves from negative feelings by shifting their attention from negative emotions towards abstracted, conceptual thoughts (i.e., worry). There is a growing body of empirical support for the avoidance model of GAD (see Borkovec et al., 2004, for a review).

Mennin, Heimberg, Turk, and Fresco (2002, 2005) developed an emotion dysregulation model of GAD that complements the avoidance model. The emotion dysregulation framework provides an explanation for why individuals with GAD would seek to avoid their emotions. Mennin and colleagues (2002) propose that individuals with GAD experience unusually intense negative emotions yet have

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trouble identifying and modulating these emotions. Because these individuals do not have (or cannot access) emotion regulation skills to reduce their heightened emotionality, individuals with GAD rely heavily on the less-adaptive emotion-regulation strategy of worry to avoid suffering. Mennin et al. (2002) further suggest that by suppressing their emotional experience through overreliance on worry, persons with GAD restrict their access to important cues about the interpersonal environment and are thus vulnerable to a variety of relationship difficulties. Initial studies provide some evidence in support of the emotion dysregulation framework. In one study, students who met criteria for GAD on the Generalized Anxiety Disorder Questionnaire for DSM-IV and scored above the median on the Penn State Worry Questionnaire reported more intense emotional experience, a reduced ability to identify and describe their emotions, greater aversion to experiencing negative emotion, and greater restriction in their ability to soothe themselves than did nonanxious controls (Mennin et al., 2005, study 1). These findings were replicated in a clinical study (Mennin et al., 2005, study 2).

An additional problem of individuals with GAD, which could contribute to both the development and the maintenance of GAD, is difficulty with interpersonal relationships. For instance, individuals with GAD have been found to report considerable interpersonal problems (Borkovec, Newman, Pincus, & Lytle, 2002), to view themselves as interpersonally less effective than others (Turk, Mennin, Fresco, & Heimberg, 2000), and to report being overly nurturant and intrusive in relationships (Eng & Heimberg, 2006; Pincus & Borkovec, 1994). Moreover, GAD is associated with marital difficulties, including separation and divorce (Hunt, Issakidis, & Andrews, 2002; Whisman, Sheldon, & Goering, 2000), lack of friends (Whisman et al., 2000), and low family cohesiveness (Ben-Noun, 1998). A recent laboratory observation study identified some of the ways that students with analogue GAD behave that may contribute to their interpersonal difficulties. Compared to control students, they have greater difficulties understanding the impact that they have on others, and their displays of emotion are more negative during self-disclosure interactions (Erickson & Newman, 2007).

Thus, both recent theory and research suggest that intense emotional experience, emotion-regulation difficulties, and interpersonal problems underlie the propensity of individuals with GAD to worry. Of further interest is consideration of what factors underlie these problems. Developmental history, specifically the quality of the person's

early relationship with primary caregivers, could give rise to an experience of heightened emotionality, emotion regulation difficulties, as well as the negative interpersonal perceptions evidenced by the individual with GAD in adulthood.

Few studies have examined the childhood precursors of GAD, and the majority are limited by the lack of a control group of nonanxious participants. For instance, in one study, GAD participants without panic attacks did not differ from GAD participants with panic attacks on the Childhood Behavior Disturbance Scale (Hoehn-Saric, 1981). In another study, adults with GAD did not differ from adults with panic disorder on a variety of reported childhood events, including abuse, separation, and separation anxiety (Raskin, Peeke, Dickman, & Pinsker, 1982). The adults with panic disorder did, however, report a more "grossly disturbed childhood environment" (Raskin et al., 1982, p. 687). A third study examined several childhood problems (nightmares, various fears, parental divorce, separation) and again found no differences between these two groups, except that adults with panic disorder reported more chronic anxiety in childhood and adults with GAD reported a greater incidence of parental loss before age 16 (Torgersen, 1986). Another study found that adults with GAD were more likely to report exposure to traumatic events than nonanxious adults (Roemer, Molina, Litz, & Borkovec, 1997).

As Rapee (1991) pointed out in his review of research on the childhood experiences of individuals with GAD, a strong theoretical base has been lacking in prior studies and is essential in future research. Cassidy (1995) has proposed that Bowlby's attachment theory (1969/82, 1973, 1980; see also Cassidy & Shaver, 1999, *in press*) offers a theoretical framework within which the developmental antecedents of GAD can be usefully considered. According to Bowlby, attachment processes are central to understanding anxiety. This proposition rests on his notions about the biological bases of the attachment system, the fear system, and the interrelations between the two. Bowlby proposed that during the time in which humans were first evolving, genetic selection favored attachment behaviors because they increased the likelihood of infant-parent proximity which, in turn, increased the likelihood of infant survival. Of particular relevance when considering anxiety is the fact that the attachment system is activated especially in times of stress or threat when the fear system is also activated. At those times, it is of survival value for the child to seek proximity to and protection from the attachment figure (usually the mother). The availability and responsiveness of this figure are

thought to be of great importance in reducing the child's fearfulness, and indeed, there is considerable empirical evidence that this is so (Ainsworth & Wittig, 1969; Sorce & Emde, 1981).

The cornerstone of Bowlby's thinking is that an individual is likely to be less anxious if he or she has confidence in the availability of a protective, comforting attachment figure when needed. Although this biological intertwining of the attachment and fear systems is thought to be common to all humans as a result of natural selection, Bowlby (1973) proposed considerable individual variation in the ability of the child to derive security from the attachment figure. While acknowledging the important contributions of such factors as genetics and child temperament to the tendency to become anxious, Bowlby focused on environmental factors.

Chief among those factors were experiences which would leave a child uncertain about the availability of the attachment figure. According to Bowlby, "when an individual is confident that an attachment figure will be available to him whenever he desires it, that person will be much less prone to either intense or chronic fear than will an individual who for any reason has no such confidence" (1973, p. 202). Major attachment-related trauma is by no means the only environmental contributor to anxiety; a child's repeated daily experiences with a caregiver can also be influential (see also Cassidy & Mohr, 2001; Kobak, 1999; Kobak, Cassidy, Lyons-Ruth, & Ziv, 2006). For instance, a child whose bids for comfort (particularly in times of stress) are ignored, mocked, or rejected, is expected to become anxious. Experiences with a parent resentful of being called upon to provide care leave the child hesitant about seeking care in subsequent times of threat. In some extreme situations, the parent-child relationship is reversed, and the child is given the task of caring for the parent in order to insure the well-being of both parent and child, a task developmentally beyond the child's capability. Because the child's initial fears are compounded by the fact that the attachment figure is not only unavailable to help but must also be cared for, role-reversing relationships are thought to be particularly likely to produce long-lasting anxiety. Furthermore, it is unlikely that the child could derive security from an attachment figure so incompetent that she herself requires the child's care.

According to clinical observations (Bowlby, 1973) and to empirical work (Ainsworth, Blehar, Waters, & Wall, 1978; DeWolfe & van Ijzendoorn, 1997), most children receive the kind of care which assures them that the caregiver will be available if needed; they have an accessible and responsive caregiver whom they can use as a "secure base"

from which to explore and to whom they can return as a "safe haven" should trouble arise. These children are considered to be securely attached. Conversely, children who cannot count on the availability of the caregiver are considered to be insecurely attached.

It is important to note that although insecure attachment itself is not equated with psychopathology (DeKlyen & Greenberg, *in press*; Sroufe, Egeland, Carlson, & Collins, 2005), certain psychopathologies may well be rooted in insecure attachment. There are several reasons why one would expect the developmental roots of GAD to lie in insecure attachment. One set of reasons is based on the inherently interpersonal nature of worry, the central characteristic of GAD. Worry has been found to be most highly related to fears associated with social evaluation and interpersonal relationships (e.g., feeling self-conscious, meeting new people, being criticized) and unrelated to most noninterpersonal objects or events (Borkovec, Robinson, Pruzinsky, & DePree, 1983; Roemer, Molina, & Borkovec, 1997). Furthermore, worry involves a predominance of thought activity and as such can be viewed as part of the verbal/linguistic system, which in turn emerged both developmentally and evolutionarily as a social communicative device (see Borkovec et al., 2004; Freeston, Dugas, & Ladouceur 1996). Given these findings, it is not surprising that one of the most frequent comorbid diagnoses associated with GAD is social phobia; this is true for none of the other anxiety disorders (Barlow, 1988; Brown & Barlow, 1992; Mennin, Heimberg, & Jack, 2000).

Second, considerable theoretical (Beck & Clark, 1997; Beck & Emery, 1985; Clark, 1989; Clark & Beck, 1998) and empirical (Beck, Laude, & Bohnert, 1974; Butler, Cullington, Hibbert, Klimes, & Gelder, 1987; Hibbert, 1984; Riskind & Williams, 2005) literature indicates that individuals with GAD make a variety of logical cognitive errors which lead to unrealistic perceptions of physical and/or psychological danger. These individuals view the world as a dangerous place, overestimating the probability and severity of feared events and underestimating their own coping resources. According to Bowlby (1973), these are the very cognitions that arise from an insecurely attached child's experiences. In the face of threat, if the attachment figure does not provide desired comfort, the child is thought to develop mental "representational models" of the world as frightening and of the self as ineffectual in eliciting help. Research has suggested that insecurely attached children are more likely to have such negative cognitions than are securely attached children (Bretherton, Ridgeway, & Cassidy, 1990;

Cassidy, 1988; Cassidy, Kirsh, Scolton, & Parke, 1996; Kirsh & Cassidy, 1997; Main, Kaplan, & Cassidy, 1985).

Third, the emotion dysregulation difficulties that characterize individuals with GAD (Mennin et al., 2005) are thought to be closely linked to attachment. In keeping with attachment theory (Bowlby, 1969/82, 1973), theorists have described the ways in which a child's emotion regulation capacities emerge in large part from the child's attachment relationships (Cassidy, 1994; Thompson, 1994). Indeed, Crowell and her colleagues (e.g., Guttman-Steinmetz & Crowell, 2006) have referred to attachment as "a relational emotion regulation system" (p. 446; see also Sroufe & Waters, 1977, and Sroufe et al., 2005). The representations that securely attached children have of others as available and responsive and of the self as capable of eliciting such care are thought to lead to the child's growing confidence that distressing emotions are tolerable—that distressing emotions can be recognized, acknowledged, tolerated, and recovered from (i.e., effectively regulated) rather than having to be denied or avoided. In addition, these representations are also thought to guide the infant to seek soothing when distressed, and through the repetition of experiences of being soothed, the child develops capacities for competent self-soothing and emotion regulation (Fonagy, Gergely, & Target, in press; Sroufe et al., 2005). In contrast, insecure attachment is associated with one of two major patterns of responding to distressing emotions, both of which reflect a lack of confidence in the availability of a responsive attachment figure when needed: avoidant attachment is associated with suppression and denial of threats and stressors and withdrawal from relationship partners, whereas anxious attachment is associated with magnifying threats and stressors and obsessively ruminating about problems. These patterns are evident in a large body of research with infants and children (Cassidy, 1994) as well as in hundreds of experimental and correlational studies of adolescents and adults (reviewed by Mickulincer & Shaver, 2006). Both of these insecure patterns are associated (albeit via differing pathways) with difficulties regulating emotions in the face of stress.

Fourth, the characteristically diffuse nature of GAD (Barlow, 1988) parallels the very type of anxiety that Bowlby proposed to be associated with insecure attachment. According to Bowlby (1973), a pervasive anxiety and a generalized sense of danger arise because, *no matter what the source of the fear*, the individual lacks confidence that the attachment figure will be available in times of trouble.

Fifth, a pattern of findings which indicates that GAD (a) occurs within families yet (b) lacks a strong

genetic component suggests that family social relationships (among which attachment is central) may be related to GAD. Several studies present such a pattern when considered together. One study reported preliminary evidence of a family connection for GAD: First-degree relatives of individuals with GAD were significantly more likely than first-degree relatives of nonanxious controls to have GAD themselves (Noyes, Clarkson, Crowe, Yates, & McChesney, 1987). In another study, no genetic influence for GAD was evident; the concordance rates were similar for monozygotic and dizygotic twins (Torgersen, 1983). Studies examining both female twin pairs (Kendler et al., 1995) and male twin pairs (Scherrer et al., 2000) have revealed a general genetic vulnerability for GAD and depression rather than a specific heritability for GAD. Hudson and Rapee (2004) concluded their review of this literature with the proposition that whereas genetics may contribute to increased general risk, the environment may play a large role in the specific development of GAD.

Thus, because of a compelling theoretical framework well supported by converging empirical data, we designed a study to investigate connections between GAD and attachment. Recent theorizing about and measurement of attachment in adults have identified two important components of attachment, both of which may influence current social and psychological functioning: (a) childhood attachment experiences, and (b) "current state of mind with respect to attachment" (George, Kaplan, & Main, 1984, 1985; Hesse, 1999, in press; Main & Goldwyn, 1984; Main, Goldwyn, & Hesse, 2003; Main et al., 1985). The importance of childhood attachment experiences has been shown in several longitudinal studies that indicate that individuals with early experiences of being securely attached to a responsive caregiver are more likely to function well than those who had been insecurely attached (Sroufe et al., 2005; see also Grossmann, Grossmann, & Waters, 2006). A second important component of attachment is what Main and her colleagues have called "current state of mind with respect to attachment," that is, the degree to which both positive and negative childhood attachment experiences are integrated in a coherent narrative that reflects a valuing of attachment (Main et al., 1985). Considerable evidence indicates that "state of mind with respect to attachment" is associated with a variety of aspects of adult psychosocial functioning (for a review, see Hesse, 1999, in press). Moreover, there is considerable interest in understanding the differential contributions of each of these aspects of attachment to current adult functioning. Several studies have reported that

childhood experiences themselves are not deterministic of adult functioning. Even in the face of (coder-rated) probable negative childhood experiences, adults appear able to engage in healthy adult relationships as long as their current state of mind is secure (Paley, Cox, Burchinal, & Payne, 1999; Pearson, Cohn, Cowan, & Cowan, 1994; Phelps, Belsky, & Crnic, 1998). Yet despite these findings, one of these studies also reported that negative childhood experiences (irrespective of current state of mind) were linked to current depressive symptoms (Pearson et al., 1994).

Empirical examination of the connection between GAD and attachment is most feasible with the retrospective study of adults with GAD. In a previous study of undergraduate students who met self-report criteria for GAD, insecure attachment to parents (assessed with the Inventory of Parent and Peer Attachment; Armsden & Greenberg, 1987) was, as expected, more characteristic of the GAD participants than control participants (Eng & Heimberg, 2006). In the present study, we extend this work by comparing a group of adult therapy clients with GAD to a matched nonanxious control group on two attachment dimensions measured via self-report: childhood attachment experiences and current state of mind. We expected that compared to participants in the control group, GAD participants would report less positive childhood experiences and a less secure current state of mind. Next, following a central tenet of the developmental psychopathology perspective, we also examine a cumulative model of childhood attachment risk for the development of GAD (Cicchetti, 2006; Kobak et al., 2006; Rutter, 1990). Given evidence that the likelihood of the development of psychopathology increases with increasing numbers of risk factors (e.g., Belsky & Fearon, 2002; Fergusson & Horwood, 2003), we hypothesized that this would be the case in relation to GAD. Finally, in addition to examining aspects of attachment individually, we also examined the joint contributions of childhood attachment experiences and current state of mind to prediction of membership in the GAD group versus the control group; the previous research literature did not lead us to a specific hypothesis for this final analysis.

Method

PARTICIPANTS

One-hundred thirty-eight participants were recruited for this study. Sixty-nine were GAD clients participating in a therapy outcome investigation (see Borkovec et al., 2002) and were recruited by

referrals and from media announcements. Sixty-nine nonanxious control participants were also recruited through media announcements and were matched to the GAD clients on gender, age, race, and education. There were 48 male participants (42 Caucasian, 2 Hispanic/Latino, 2 Middle-Eastern, 2 Indian/Asian) and 90 female participants (80 Caucasian, 4 African-American, 4 Hispanic/Latino, 2 Indian/Asian) who ranged in age from 19.2 to 66.9 years ($M=37.0$ years, $SD=11.9$). Education level ranged from 12 to 21 years ($M=16.5$ years, $SD=2.1$). GAD clients completed the Perceptions of Adult Attachment Questionnaire (Lichtenstein & Cassidy, 1991) during a questionnaire session as part of a pre-therapy assessment battery. Control participants were paid for their participation.

MEASURES

GAD status. Both potential clients and control participants were screened during a 30-minute telephone interview and were then interviewed by diagnostic assessors following the Anxiety Disorder Interview Schedule-Revised (ADIS-R; cf. DiNardo & Barlow, 1988). This structured diagnostic interview was developed to assess *DSM-III-R* criteria and additional questions in the GAD section corresponding to two criteria being proposed at the time of study initiation by the *DSM* GAD subcommittee (i.e., uncontrollable worrying and three of six somatic symptoms) and also included the Hamilton Anxiety and Depression Scales (Hamilton, 1959, 1960). Mean scores on the Hamilton Anxiety and Depression Scales for the clinical sample were 24.69 ($SD=6.82$) and 13.55 ($SD=7.10$), respectively. It is important to note that approximately halfway through the 5-year enrollment period, the *DSM-IV* was published, and all but two clients in the study (97.1%) met both the *DSM-III-R* and *DSM-IV* criteria for GAD. The interview allowed for differential diagnosis among anxiety and mood disorders and the ruling out of psychosis, substance abuse, and organic brain disorders. In the case of clients, because of the relatively low diagnostic agreement for GAD (Barlow, 1988), independent diagnosis by two assessors conducting separate ADIS-R interviews was required before the client was accepted. Clinical graduate assistants with at least 2 years of experience in diagnostic interviewing conducted the initial ADIS-R interviews, and a postdoctoral clinician conducted the second interviews. Inclusion/exclusion criteria for GAD clients were: (a) formal principal diagnosis of GAD by both assessors, or consensus diagnosis by both assessors in the case of initial discrepancy. Additional

diagnosis of any other anxiety disorder was allowed (except for panic disorder with or without agoraphobia) as long as GAD was the most severe and thus principal diagnosis; (b) assessor global severity rating of 4 ("moderate") or greater on the 0- to 8-point ADIS-R scale of severity of GAD anxiety-related symptomatology; (c) absence of substance abuse, psychosis, or medical conditions underlying anxiety, and the absence of a major depression requiring immediate treatment; and (d) not currently in psychotherapy and having never received cognitive/behavioral treatments. Clients were advised to have a physical exam if physical causes of the anxiety (e.g., hypothyroidism, caffeine intoxication, hypoglycemia) had not been ruled out by such exam within the previous year.

Control participants were screened by one of the diagnostic assessors following both telephone interview and ADIS-R procedures and met criteria for no diagnosable disorder.

Attachment. Attachment was assessed with the Perceptions of Adult Attachment Questionnaire (PAAQ; Lichtenstein & Cassidy, 1991), a 60-item measure designed to assess two key aspects of attachment: (a) an individual's perceptions of his or her early childhood experiences with a primary caregiver (usually the mother), and (b) the individual's "current state of mind with respect to attachment." These two superordinate attachment dimensions are tapped with eight subscales. The items are based on Main and Goldwyn's (1984) system for scoring the Adult Attachment Interview (AAI; George et al., 1984, 1985) and on Bowlby's attachment theory (1969/1982, 1980, 1988). Participants use a 5-point Likert-type scale, ranging from "strongly disagree" to "strongly agree," to note the extent to which they agree with each statement. The three subscales tapping perceptions of childhood relationship with the primary caregiver include (a) rejection/neglect (11 items; e.g., "When I was a child, my mother sometimes told me that if I was not good she would stop loving me"), (b) being loved (6 items; e.g., "In childhood I felt like I was really treasured by my mother"), and (c) role-reversal/enmeshment (10 items; e.g., "I often felt responsible for my mother's welfare"). The five subscales tapping current state of mind with respect to attachment include (a) vulnerable (5 items; e.g., "My mother's issues are still interfering with my life"), (b) balancing-forgiving (7 items; e.g., "Even with all our past difficulties, I realize my mother did the best for me that she could"), (c) angry (5 items; e.g., "No one gets under my skin like my mother"), (d) dismissing/derogating (4 items; e.g., "My family was not particularly intimate,

but this has never bothered me"), and (e) lacking in memory about childhood (4 items; e.g., "I have forgotten what most of my early childhood was like"). Subscale scores are derived by computing the mean of the items that comprise each subscale, and thus the range of possible scores for each subscale is between 1 and 5.

Good psychometric properties for the PAAQ have been reported. For instance, in a validation study of 247 college students (Lichtenstein & Cassidy, 1991), factor analysis revealed support for the theoretically based subscales, and the subscales showed high internal consistency (coefficient alphas: rejection/neglect=.87, being loved=.87, role-reversal/enmeshment=.79, vulnerable=.71, balancing/forgiving=.70, angry=.80, dismissing/derogating=.62, lacking in memory=.90). In a second sample of 123 mothers, coefficient alphas were rejection/neglect=.91, being loved=.92, role-reversal/enmeshment=.69, vulnerable=.76, balancing/forgiving=.65, angry=.84, dismissing/derogating=.51, lacking in memory=.94) (Lichtenstein & Cassidy, 1991). Similar internal consistency emerged from a study that used six of the eight PAAQ subscales ($n=206$; Huth-Bocks, Leven-dosky, Bogat, & von Eye, 2004), with coefficient alphas as follows: rejection/neglect=.91, being loved=.92, vulnerable=.65, angry=.79, dismissing/derogating=.49, lacking in memory=.93). In the current study, coefficient alphas were consistent with these three samples and were as follows: rejection/neglect=.89, being loved=.87, role-reversal/enmeshment=.81, vulnerable=.81, balancing/forgiving=.63, angry=.83, dismissing/derogating=.41, lacking in memory=.94). Good test-retest reliability also emerged in Lichtenstein and Cassidy's (1991) college student sample, ranging from .68 to .86 over a 3-week retest interval. In the current sample, test-retest reliability was good for the eight subscales of the PAAQ and ranged from .73 to .89 over a 14-week retest interval. Finally, good construct validity for the PAAQ has emerged. Lichtenstein and Cassidy (1991) reported significant correlations between the PAAQ and AAI subscales in their sample of 123 mothers ($r_s=.46-.63$, $p<.01$), except for the enmeshment/role-reversal subscale ($r=.10$) and the dismissing/derogating subscale ($r=.13$). In addition, in the Huth-Bocks et al. (2004) study mentioned above, higher scores on a composite index of insecure attachment based on six of the eight subscales was found to relate to pregnant women's lower satisfaction with social support and less secure representations of caregiving (assessed with the Working Model of the Child Interview; Zeanah, Benoit, Hirshberg, Barton, & Regan, 1994).

Results

A multivariate analysis of variance (MANOVA) was conducted on the eight subscales of the PAAQ and yielded a significant difference between the GAD clients and the matched control group participants, $F(8, 129)=7.57$, $p<.001$, $\eta^2=.32$. Follow-up analyses revealed significant differences for all three childhood attachment experiences subscales, and for two of the five subscales tapping current state of mind with respect to attachment. GAD clients, compared to nonanxious controls, reported significantly higher childhood rejection/neglect and role-reversal/enmeshment, and significantly lower experiences of being loved and cared for by the primary caregiver. In terms of current state of mind with respect to attachment, GAD clients, compared to nonanxious controls, reported significantly higher vulnerability toward their mothers and also reported greater difficulty recalling childhood memories. Group means, standard deviations, F values, and effect sizes for the follow-up analyses are given in Table 1.

Next, in order to examine a cumulative model of childhood attachment risk for the development of GAD, we created a median split of each of the three childhood attachment experiences subscales. Participants were identified as having a risk factor when they scored above the median on the rejection/neglect (median=1.86) and role-reversal/enmeshment (median=2.20) subscales, and below the median on the being loved subscale (median=3.83). A 2×4 contingency table analysis (GAD, Control $\times$ 0 Risk, 1 Risk, 2 Risks, 3 Risks) revealed a significant relation between diagnostic status (GAD vs. Control) and risk, $\chi^2(3, N=138)=12.18$, $p<.007$. The association was of moderate strength: $\phi=.297$, and

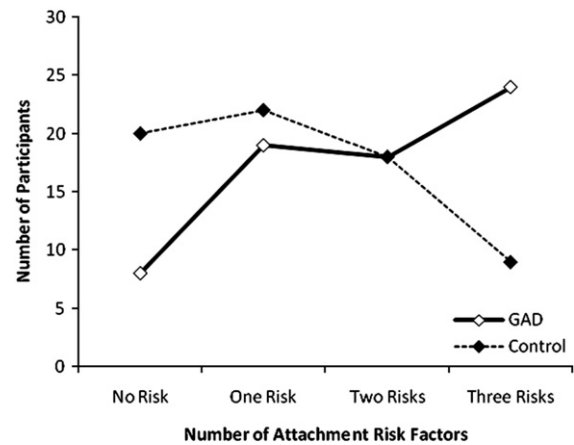


FIGURE 1 Cumulative model of childhood attachment risk for the development of generalized anxiety disorder (GAD).

level of risk accounted for 8.8% of the variance in diagnostic group. See Fig. 1.

Finally, in order to determine how well the PAAQ subscales that differentiated the GAD clients from their nonanxious counterparts could predict group membership, a binary logistic regression was conducted with the five subscales entered simultaneously as predictors and group membership (GAD vs. control) as the binary dependent criterion. In binary logistic regression, the Hosmer-Lemeshow statistic indicates a poor fit to the data when $p<.05$; therefore the model generated in the present study demonstrated a good fit to the data, $\chi^2(8)=8.19$, $p<.415$; $-2 \log \text{likelihood}=145.41$. The Cox and Snell R^2 and the Naglekerke R^2 are estimates of the percentage of the dependent variable which can be accounted for by the predictor variables included in the model, and were .283 and .377, respectively,

Table 1
Mean Perceptions of Adult Attachment Questionnaire (PAAQ) subscale scores as a function of group

PAAQ scale	GAD ($n=69$)	Control ($n=69$)	F ($df=1, 136$)	Effect Size (η^2)
<i>Perception of childhood experiences</i>				
Rejection/Neglect	2.19 (0.79)	1.74 (0.67)	13.23 **	.09
Being Loved	3.49 (0.98)	3.83 (0.80)	5.37 *	.04
Role-Reversal/Enmeshment	2.49 (0.72)	2.16 (0.59)	8.98 *	.06
<i>Current state of mind</i>				
Vulnerable	3.08 (0.91)	2.23 (0.68)	38.86 **	.22
Balancing/Forgiving	3.75 (0.49)	3.63 (0.57)	n.s.	.01
Angry	2.29 (0.91)	2.03 (0.92)	n.s.	.02
Dismissing/Derogating	2.51 (0.68)	2.47 (0.67)	n.s.	.00
Lacking in Memory	3.19 (1.17)	2.40 (0.99)	18.41 **	.12

Note. GAD=generalized anxiety disorder. Standard deviations are given in parentheses. All F values were computed with Pillai's trace method.

* $p<.05$.

** $p<.001$.

Table 2
Logistic regression analyses

PAAQ scale	β	S.E.	Wald	d.f.	Sig	Est. odds ratio	95% C.I. for odds	
							Lower	Upper
Rejection/Neglect	0.42	0.49	0.75	1	.39	1.53	.58	3.99
Being Loved	0.20	0.40	0.25	1	.61	1.22	.56	2.69
Role-Reversal/Enmeshment	0.28	0.34	0.69	1	.41	1.33	.68	2.59
Vulnerable	1.06	0.30	12.75	1	.001	2.90	1.61	5.18
Lacking in Memory	0.55	0.19	7.94	1	.005	1.72	1.18	2.52
Constant	-6.52	2.36	7.66	1	.006			

Note. PAAQ=Perceptions of Adult Attachment Questionnaire.

indicating that the model accounted for between 28.3% and 37.7% of the variance in predicting diagnostic status (GAD vs. Control). Finally, the logistic regression analysis yielded an overall classification accuracy rate of 73.9%, with 78.3% of control participants accurately classified, and 69.6% of GAD participants accurately classified. Results from the regression analysis are presented in Table 2. Even though each of these five subscales individually differentiated GAD and control participants, when these subscales were included simultaneously in the model, only the two current state of mind subscales (vulnerable and lacking in memory) reliably predicted diagnostic status. The values of the coefficients revealed that an increase of one unit on the vulnerable scale was associated with an increase in the odds of being categorized as GAD by a factor of 2.90 (95% CI 1.61–5.18), and that each unit increase on the lacking in memory scale was associated with an increase in the odds of being categorized as GAD by a factor of 1.72 (95% CI 1.18–2.52).

Discussion

In recent years, research and theory related to GAD and its treatment have expanded to include an increased focus on interpersonal issues (Borkovec et al., 2002; Crits-Christoph, 2002; Eng & Heimberg, 2006; Newman, Castonguay, Borkovec, & Molnar, 2004) and aspects of emotion regulation (Mennin, Turk, Heimberg, & Carmin, 2004; Mennin et al., 2005) that may be rooted in the attachment factors that influence these domains. The results of this study serve to further the understanding of the nature of GAD by shedding light on the developmental roots and current attachment-related state of mind that may contribute to the development and maintenance of GAD. Findings from this study support our theoretically based expectations that participants with GAD would differ from control participants on adult reports of both childhood attachment experiences and current state of mind

with respect to attachment. GAD and control participants differed on all three childhood experiences subscales, and on two of the five state of mind subscales. These findings converge with previous work showing links between insecure attachment and anxiety in children and adolescents (Bosquet & Egeland, 2006; DeKlyen & Greenberg, in press; Laible, Carlo, & Raffaelli, 2000; Muris, Meesters, van Melick, & Zwambag, 2001; Warren, Huston, Egeland, & Sroufe, 1997).

The finding that childhood experiences of role-reversal/enmeshment characterized GAD participants more than control participants meshes with attachment theory and previous research with children. According to attachment theory (Bowlby, 1973, 1988), anxiety results from the lack of a secure base, that is, the lack of an attachment figure whom the child can trust to be available in times of trouble (see also Bradley, 2000). Childhood role-reversal, by definition, suggests the lack of a secure base. The child cannot count on the parent for care, but must instead provide care to the incompetent parent. The child in this situation is expected to assume a role of responsibility that exceeds his or her own developmental capabilities. A parent may invert the parent-child relationship not only by making excessive demands on the child for caregiving, but also, paradoxically, by emphasizing the child's immature and incompetent status, a practice which "is one technique for ensuring that the child remains available as an attachment figure" (J. Bowlby, personal communication, cited in Stevenson-Hinde, 1990, p. 223). Furthermore, the parent may attempt to focus the child's attention on the relationship with the parent by emphasizing the frightening aspects of the larger environment. Thus, the child in a role-reversing relationship may develop the interconnected beliefs that the world is frightening, that a caregiver is not available to provide protection, and that he or she is unable to cope with demands made by the parent. It is plausible that such a constellation of beliefs would provide the developmental basis for the adult GAD

client's tendency to try to anticipate all threats through his/her chronic worrying. The fact that this set of beliefs is similar to the core beliefs typical of individuals with GAD (Sibrava & Borkovec, 2006) may account for the connection between reports of childhood role-reversal and GAD in the present study (see Macfie, McElwain, Houts, & Cox, 2005, for findings of links between role-reversal and insecure/disorganized attachment in children, and Macfie, Houts, & McElwain, 2005, for findings of links between role-reversal and behavior problems in children). These findings may also explain the emotion regulation difficulties of individuals with GAD. A child experiencing role-reversal might need to exaggerate his or her emotions in order to draw the attention of the caregiver away from preoccupation with her own needs. A child who constantly inflates emotional expression in order to receive care might become less adept at accurately reading the environment and responding emotionally later in life.

The two additional aspects of childhood experience examined here, experiences of relatively low maternal love and relatively high maternal rejection/neglect, were also related, as expected, to GAD status. Such experiences are thought to lead to the use of cognitive and affective mechanisms designed to avoid the painful feelings associated with negative maternal treatment (Ainsworth et al., 1978; Cassidy, 2004; Cassidy & Kobak, 1988; Main, 1981; Mikulincer, Shaver, & Cassidy, in press), an early emerging tendency that may set the path for the use of avoidance that Borkovec and his colleagues (2004) have proposed to underlie GAD. These findings are consistent with previous work showing that a variety of problematic family interaction patterns are linked to avoidant coping in adolescents (e.g., Hanson et al., 1989; Lohman & Jarvis, 2000; Wolfradt, Hempel, & Miles, 2003). Moreover, these results may help to explain both the interpersonal nature of the worries identified by individuals with GAD (Roemer et al., 1997) as well as the strong association between GAD and social phobia (Barlow, 1988; Brown & Barlow, 1992). It is indeed possible that if individuals experience a significant amount of rejection and neglect early in the course of their development, they can come to be fearful of rejection later in life and therefore expend greater mental energy worrying about relationships.

Findings that, as expected, risk for GAD increased as indices of poor childhood attachment experience increased are consistent with the cumulative risk model that is central to the developmental psychopathology perspective (Cicchetti, 2006). Whereas having *no risk factors* was relatively unlikely to characterize GAD participants

(11.6%, as opposed to 29% of control participants), having *three risk factors* was relatively unlikely to characterize control participants (13% as opposed to 34.8% of GAD participants). This finding is consistent with much previous research showing that increasing risk has increasingly negative consequences for the developing organism (Luthar, 2003). In order to fully understand how childhood risk influences later psychopathology, it is important to consider, as Cicchetti (2006) has noted, whether the increasing risk is additive or whether risk processes interact synergistically with an exponential impact.

Moreover, when considering cumulative risk factors, it is important to view connections between GAD and childhood attachment within a broad framework. Consistent with a transactional perspective (Sameroff & Chandler, 1975; see also recent theory and research related to Gene $\times$ Environment interaction, Cicchetti, 2007; Taylor & Kim-Cohen, 2007), attachment theorists have proposed a model that places childhood attachment "in the context of a large array of biological and experiential factors that affect risk" for psychopathology (Cummings & Cicchetti, 1990, p. 356). These factors include biological foundations (both genetic and neurodevelopmental factors), nonattachment aspects of parent-child interaction, larger familial relationships, the wider social network, stressful life events, SES, competence (in work and other activities), and coping skills. Insecure attachment is thought to increase an individual's vulnerability to psychopathology by leaving him or her with reduced coping skills with which to deal with stressors, reduced capacities to regulate distressing emotions, and with a decreased ability to develop relationships which would serve as a protective social support network during times of stress (see also Hudson & Rapee, 2004, for discussions of attachment as part of a broader etiological model in the development of anxiety).

Two of the five subscales tapping current state of mind with respect to attachment—vulnerability and lack of memory for childhood events—significantly differentiated GAD and control participants. The greater feelings of vulnerability in relation to the mother that characterize GAD clients may directly contribute to GAD. An adult who is highly vulnerable to negative feelings resulting from the mother's criticisms may be particularly at risk for anxiety because the attachment figure not only fails to provide a secure base for the individual during times of trouble but also serves as a source of trouble. Furthermore, such an individual has failed to develop protective coping mechanisms, and the difficulties with the mother remain unresolved. The

findings that GAD participants reported greater difficulty remembering their childhood attachment experiences than their nonanxious counterparts may either reflect their generalized perceptions of themselves as performing poorly (i.e., they believe they should remember more than they do), or may indicate that GAD participants actually do remember less than nonanxious control participants. A connection between memory loss and anxiety was a central theme in Freud's (1896) original theory of neurosis. He proposed that adult memory loss for childhood was associated with traumatic childhood events and that anxiety resulted from the inability to effectively repress the memories of trauma. Although Freud later revised his theory to minimize the role of experiences in favor of unresolved fantasy, repression remained a key component in the etiology of anxiety from a psychoanalytic perspective (Masson, 1984). An additional perspective emerges from studies that suggest that worry is associated with substantial cognitive avoidance, and in fact, that worry seems to serve the function of preventing the processing of disturbing emotional material (Borkovec et al., 2004; Butler, Wells, & Dewick, 1995). The lack of memory for childhood events may be a component of the cognitive avoidance characteristic of GAD participants.

The remaining three subscales tapping current state of mind with respect to attachment—dismissing/derogating, angry, and balancing/forgiving—did not differentiate GAD and control participants. Theorists and clinicians have speculated that both a state of mind in which the importance of attachment is dismissed or derogated and a state of mind in which anger about attachment experiences is heightened may serve to protect individuals from experiencing pain associated with insecure attachment experiences (Cassidy, 2004; Fosha, 2000; Mikulincer et al., *in press*). If this is true, then this might explain why these aspects of attachment-related state of mind are no more common among GAD clients than among control participants. It may also be that these three dimensions of state of mind with respect to attachment are particularly difficult to capture with a self-report measure. Replication of this work will be important to determine whether the same pattern of results emerges from future studies.

In addition to providing evidence that GAD is associated with both childhood experiences and some aspects of current state of mind with respect to attachment, this study also provides information about the role of attachment factors in predicting GAD status. The PAAQ subscales were able to accurately predict diagnostic group status for nearly three-quarters of participants. The findings

that simultaneous inclusion of both childhood and current state of mind subscales results in prediction only by the state of mind scales echoes findings from studies using the Adult Attachment Interview. As noted above, data from several studies suggest that the current functioning of adults whose childhoods were rated by coders as likely to have been characterized by insecure attachment varies as a function of their current state of mind: that is, negative childhood experiences had negative outcomes largely in the context of an insecure current state of mind (Paley et al., 1999; Pearson et al., 1994; Phelps et al., 1998; see also Hesse, *in press*).

Several issues should be considered when interpreting the findings of the present study. One relates to the fact that retrospective self-reports of early attachment experiences were used. The limitations of self-report measures are well-known, and self-report measures of childhood attachment may be particularly problematic (Cassidy & Kobak, 1988). Furthermore, although studies using retrospective reports may have fewer limitations than previously assumed (Brewin, Andrews, & Gotlib, 1993), there are nonetheless limitations to which investigators must be sensitive. GAD participants' negative representations of early childhood might be influenced by a current negative mood state or by specific characteristics that are associated with their symptomatology. For example, a GAD participant might deduce from his or her current inclination to worry that he or she may have "worried" about the caregiver during childhood. This might result in endorsement of items that would artificially inflate the role-reversal/enmeshment subscale score (e.g., "I often worried about my mother's health"). However, although there is some indication that depressed mood may influence memory, it is noteworthy that several studies converged to indicate that GAD has no such influence on explicit memory, and mixed evidence of influence on implicit memory (e.g., Eysenck, MacLeod, & Mathews, 1987; Mathews & MacLeod, 1986; Mogg, Mathews, & Weinman, 1987; see Coles & Heimberg, 2002, for a review). In their review, Coles and Heimberg (2002) noted the need for continued research in relation to GAD because of the changes in diagnostic criteria for GAD that occurred subsequent to much of this research. In any event, it is important to consider that even if memories of childhood experience are not influenced by current mood state, it remains possible that participants' current state of mind about attachment is influenced by current mood state.

Another limitation of the study reported here is that it relies on a single questionnaire of adult attachment, the PAAQ. Although the PAAQ is

statistically sound and captures constructs that are central to attachment theory, it cannot effectively assess certain attachment constructs (e.g., defensive idealization of early negative experiences, coherence of mind in discussion of attachment). These constructs can be measured only with the in-depth semistructured interview (the Adult Attachment Interview; George et al., 1984, 1985) upon which the PAAQ was based. An additional study limitation is the lack of a comparison group of individuals with some other form of psychopathology. Thus, we are unable to know whether our results are linked to GAD specifically or to some more general aspect of psychopathology. Certainly, insecure attachment is thought to contribute to a variety of forms of psychopathology; moreover, there are several forms of insecure attachment, and it may be that particular forms of insecure attachment relate to particular forms of psychopathology (see Greenberg, 1999, for a review).

Given the limitations of this initial examination of links between attachment and clinically diagnosed GAD, these findings must be regarded as preliminary. Future retrospective studies could use multiple measures of attachment, as well as actual childhood records and interviews of individuals who knew the participants in childhood. Prospective studies based on observations of childhood attachment quality would be particularly valuable, as would studies that include additional psychopathology groups. Future research could benefit from a developmental pathways approach, with attempts to understand why some people with insecure attachment develop GAD as opposed to no disorder or some other disorder (Kobak et al., 2006).

Provided that additional studies replicate the present findings, implications emerge for a variety of aspects of clinical treatment. If insecure attachment, and by implication the lack of a secure base in childhood, is more characteristic of GAD clients than of nonanxious individuals, the clinical question then becomes: Can provision of a secure base in therapy be an important component of helping reduce GAD symptoms? We urge clinicians and researchers to explore whether this is the case. Evidence from recent experimental studies showing that having a secure base is associated with reduced distress suggests that such clinical secure base provision may be useful. For instance, subliminal priming designed to enhance feelings of having a secure base has been shown to help calm a person who has been asked to think about a distressing interpersonal event (Cassidy, Shaver, Mikulincer, & Lavy, submitted for publication; see also Mikulincer & Shaver, in press). In addition, recent fMRI research indicates that the presence of a secure base

influences the perception of threat in the brain (i.e., when happily married women held their husbands' hands during experimentally induced threat, threat-related neural activation was reduced; Coan, Schaefer, & Davidson, 2005, 2006). The notion of "the therapist as a secure base" was a cornerstone of Bowlby's (1988) clinical approach. The client's experience of having a secure base, perhaps for the first time, can lay the foundation for a new set of experience-based expectations, which in turn are thought to guide feelings, behavior, and psychophysiological responding.

Moreover, it might be clinically useful to consider whether some of the problems of GAD clients are associated with their lack of a secure base and to use an attachment framework to address these problems in therapy. For instance, attention to the interpersonal difficulties of GAD clients has recently become a focus of treatment wherein the client is encouraged to examine his or her own contributions to relationship difficulties (Newman et al., 2004). Some people who have lacked a secure base may engage in inappropriate, intrusive, and ultimately ineffectual attempts to derive security from others, whereas for others the lack of a secure base history might lead them to withdraw from potentially helpful intimate relationships. Because the ineffective support-seeking widely known to characterize individuals with insecure attachment (Collins & Feeney, 2000; Feeney & Collins, 2004) interferes with their ability to gain the support that might help reduce their anxiety, particular attention could be paid to helping these individuals develop strategies for effective support-seeking. Moreover, the inaccurate perceptions of interactions that characterize people with GAD (Erickson & Newman, 2007) are also associated with insecure attachment styles (for a review, see Mickulincer & Shaver, 2006, chapter 6); clinical attention to more accurate assessments of interactions could prove useful.

An additional recent treatment focus has been the emotion regulation difficulties of GAD clients. Mennin and his colleagues (2002), for instance, have proposed an emotion regulation approach that involves helping clients understand their emotions, tolerate and regulate arousing emotions, and use emotional information to guide behavior in adaptive ways. This focus meshes well with an attachment theory perspective wherein attachment is viewed as "a relational emotion regulation system" (e.g., Guttman-Steinmetz & Crowell, 2006, p. 446), and with considerable data indicating that insecure attachment is associated with emotion regulation difficulties (for reviews, see Cassidy, 1994, and Mikulincer & Shaver, in press). We propose that the emotion regulation

deficits that characterize GAD clients are the very ones that emerge from having lacked a secure base that would have provided the child with experiences in which distress was manageable and the child was calmed. Indeed Coan (in press) has proposed that because the prefrontal cortex, a key center of emotion regulation, is still developing in the early years of life, the parent essentially serves as a “surrogate prefrontal cortex” during this time. For individuals who have lacked this help when faced with distress or threat during childhood—or even worse, whose parents were the sources of threat—it is worth considering whether the therapist can come to serve as a “surrogate prefrontal cortex,” helping the individual develop emotion regulation skills.

For some clients, it may prove useful to focus on the past, with particular consideration of how the lack of a secure base may have contributed to present anxiety. The utility of the approach might be most evident to psychodynamic-interpersonal therapists whose primary focus of treatment is helping clients identify the developmental factors associated with current problematic relationships and symptoms (Crits-Christoph, 2002). This attention to the past is also emerging as part of recent therapists engaging in cognitive-behavioral and acceptance-based treatments (Mennin, 2004; Newman et al., 2004).

Finally, an important clinical implication of these findings is that childhood experiences are not deterministic of later functioning. Although negative childhood attachment-related experiences may predict increased risk for GAD within a cumulative risk model, our findings of the particular importance played by some aspects of current state of mind with respect to attachment underscore that therapeutic attempts to shift current state of mind might contribute to a reduction in GAD symptoms even in the face of a problematic developmental history.

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