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Quality of Attachment Relationships and Peer Relationship Dysfunction Among Late Adolescents With and Without Anxiety Disorders

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Abstract

Little is known about the links between anxiety disorders and parent-child attachment disorganization and quality of peer relationships in late adolescence. This study examined the quality of attachment and peer relationships among adolescents with and without anxiety disorders in a sample of 109 low-to moderate-income families. Psychopathology was assessed with the SCID-I. Attachment disorganization and dysfunction in peer relationships were measured using semi-structured interviews and behavioral observations. Adolescents with anxiety disorders and comorbid conditions showed higher levels of attachment disorganization across three measurement approaches, as well as higher levels of dysfunction in peer relationships than those with no Axis I diagnosis. Adolescents without anxiety disorders but with other Axis I disorders differed only in the quality of school relationships from those with no diagnoses. The pattern of results suggests that pathological anxiety, in the context of other comorbidities, may be a marker for more pervasive levels of social impairment.

Keywords

attachment disorganization; social dysfunction; anxiety disorders; late adolescents

1. Introduction

Anxiety disorders consist of a diverse group of psychological difficulties with varied intensities and clinical presentations. All anxiety disorders, however, share a basic component, which is intense fear and anxiety (Rapee & Barlow, 2001). Although transitory fears are part of typical development, the intense anxiety that reaches the level of an anxiety disorder is associated with internal distress, low self-esteem, deficits in emotion regulation, and high levels of life interference (Rapee, Schniering, & Hudson, 2009).

Correlates of disorders occurring during adolescence have received less attention compared to disorders of childhood and adulthood (Irwin, Burg, & Cart, 2002). Adolescence is a critical time of transition from a position of dependence on the family to more autonomous functioning in the larger community (Allen & Hauser, 1996; Sroufe, Egeland, Carlson, &

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Collins, 2005). Adolescence is also marked by rapid developmental changes including physical maturation, alterations in the neural and neurotransmitter systems underlying affect regulation, emerging increased intimacy in relationships, and growing peer influence (Spear, 2000, Sroufe et al., 2005). Not surprisingly, anxiety disorders are prevalent during this period (see Kendall, Hedtke, & Aschenbrand, 2006 for a review). Thus, it is important to investigate how the presence of anxiety disorders is related to social functioning in adolescence in both family relationships and in peer relationships including school, friendship, and romantic relationships.

The purpose of the present study was to examine the social relationship correlates of anxiety disorders among late adolescents from low- to moderate-income families. Both the disorganization in primary attachment relationships and social dysfunction in broader relationship domains were of interest.

1.1. Anxiety disorders and mother-child attachment

1.1.1. Attachment theory and anxiety—Parental regulation of the child's fear and anxiety lies at the heart of attachment theory. Bowlby (1973) proposed that, when a child is confident that the attachment figure will fulfill the secure base and safe haven roles (i.e., is securely attached), s/he will be less prone to develop anxiety in response to life stressors. By contrast, when a child is unable to predict the attachment figure's availability when experiencing disturbing situations, s/he will respond with fear and anxiety. Thus, Bowlby suggested that securely attached children will experience less anxiety than insecurely attached children.

Although disorganized attachment is the attachment pattern most associated with the development of psychopathology (DeKlyen & Greenberg, 2008; Lyons-Ruth & Jacobvitz, 2008), there has been little discussion in the literature regarding the potential association between the disorganized pattern of attachment and anxiety disorders specifically. Theoretically, individuals with disorganized attachments are thought to perceive their attachment figures as unable to protect them. In addition, developmental studies have established that parents of children with disorganized attachments are more likely to engage in frightening, frightened or atypical behavior when interacting with the child (Lyons-Ruth & Jacobvitz, 2008). At the behavioral level, attachment disorganization leads to difficulties in organizing a consistent strategy of either approaching or avoiding the caregiver when under stress. The lack of a consistent strategy to deal with distress would then leave the fearful arousal unresolved for those with disorganized attachment relationships, increasing the likelihood that anxiety would reach pathological levels. Thus, one would expect that those with disorganized attachments would be vulnerable to anxiety disorders.

As this summary indicates, disorganized attachment behaviors are defined as behaviors exhibited in relation to attachment figures (Lyons-Ruth & Jacobvitz, 2008). Thus, they are not expected to be general features of social interaction but to appear at times of attachment stress in relation to the need for comfort and security.

1.1.2. Measuring attachment disorganization in adolescence—Most studies of adolescent attachment have used the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1985). The AAI is a semi-structured interview designed to assess an individual's current state of mind about past parent-child experiences that leads to an overall classification of Secure/Autonomous, Insecure/Dismissing, Insecure/Preoccupied, or Unresolved with respect to experience of loss or abuse (George et al., 1985). The Unresolved classification indexes disorganization on the AAI. However, an important conceptual and methodological problem arises when there has been no serious loss or abuse to inquire about on the AAI.

Another approach to assessing disorganization on the AAI is to assess the presence of a pervasively unintegrated Hostile-Helpless (HH) state of mind in regard to attachment relationships (Lyons-Ruth, Yellin, Melnick, & Atwood, 2005). The Hostile-Helpless coding system indexes pervasively unintegrated and affectively polarized evaluations of attachment relationships across the interview, whether or not experiences of loss or abuse have occurred. Thus, the HH coding system complements the traditional coding of Unresolved states of mind regarding loss or trauma in assessing attachment disorganization.

The first observational assessment has been recently developed and validated for parent-child attachment disorganization in adolescence (Hennighausen, Bureau, David, Holmes, & Lyons-Ruth 2011). Specifically, the Goal-Corrected Partnership in Adolescence Coding System (GPACS) was designed to assess observed forms of disorganized attachment, including subtypes of adolescent disorganization (punitive, caregiving/role confused, and disoriented) that parallel the subpatterns of disorganization observed in preschool and middle childhood (Bureau, Easterbrooks, & Lyons-Ruth 2009, O'Conner, Bureau, McCartney, & Lyons-Ruth, 2011; Main & Cassidy, 1988). These controlling behavioral strategies are manifested either in a caregiving or a punitive fashion. Specifically, caregiving/role-confused interactions are characterized by the adolescent's efforts to maintain the parent's well-being (i.e., directing, organizing, and entertaining the parent) such as giving directives to the parent, taking the lead to assure the flow of the discussion, and telling jokes that engage and amuse the parent. Punitive interactions are characterized by overt and covert expressions of negative affect by the adolescent and/or by the parent (i.e., dominating and humiliating behavior). Finally, disoriented interactions are marked by odd, out-of-context behaviors (i.e., rapid and inappropriate shifts in affect or behavior, "freezing", wandering around the room during discussion, unusual shifts away from topic of discussion), as seen in both verbal and physical interaction. These odd behaviors are analogous to the disorganized behaviors observed in infancy, though by adolescence they occur more often in odd features of verbal discourse (Hennighausen et al., 2011). In summary, each attachment measure for adolescents captures distinct and complimentary aspects of attachment disorganization.

1.1.3. Empirical links between anxiety disorders and attachment—Recent reviews of the literature suggest that secure attachment is indeed linked to lower levels of anxiety *symptoms* in childhood and adolescence (for reviews, see Brumariu & Kerns, 2010a; DeKlyen & Greenberg, 2008). There is also some evidence suggesting that ambivalent attachment rather than avoidant attachment is associated with higher levels of anxiety and internalizing problems in preadolescence/adolescence, based on studies which included secure, avoidant, and ambivalent classifications, but not the disorganized classification (Brumariu & Kerns, 2010a, Colonnese et al., 2011). When disorganization was also assessed, disorganization rather than ambivalence was related to general internalizing symptoms in childhood/adolescence (Brumariu & Kerns, 2010a). However, Brumariu and Kerns (2010a) cautioned that few studies assessed the insecure patterns, and most of these studies examined internalizing symptoms rather than specifically anxiety. Recent studies further demonstrated that disorganized attachment is significantly related to higher levels of anxiety symptoms in childhood (Brumariu & Kerns, 2010b; Brumariu, Kerns, & Seibert, 2012; Moss et al., 2006; Borelli, David, Crowley, & Mayes, 2010). Importantly, with one exception (Warren, Huston, Egeland, & Sroufe, 1997), none of the studies reviewed in Brumariu and Kerns (2010a) examined the presence of *anxiety disorders* as compared to symptoms of anxiety, and none of the studies of adolescents measured disorganization of attachment strategies. In a more recent study of adolescents, however, Ivarsson, Granqvist, Gillberg, and Broberg (2010) showed that both the dismissing and "the cannot classify" classifications on the AAI increased the likelihood of obsessive-compulsive disorder (OCD). Unexpectedly, the unresolved category *decreased* the likelihood of OCD. OCD patients with

or without comorbid depressive disorders had a higher proportion of dismissing states of mind than patients with depressive disorders only or controls.

Even in the literature on adults there are few studies assessing the relation between attachment disorganization and anxiety disorders. Manassis, Bradley, Goldberg, Hood, and Swinson (1994) found that 78% of the 18 women with anxiety disorders (panic, OCD and Generalized Anxiety Disorder [GAD]) in their sample were classified as unresolved on the AAI. Fonagy et al. (1996) also found a significant relation between an unresolved classification and a diagnosis of anxiety disorder (GAD, OCD, phobias, and somatoform/stress disorder). Based on the Adult Attachment Projective, Buchheim and George (2011) also reported that individuals with anxiety disorders displayed significantly higher levels of unresolved attachment than controls. In contrast, in a sample of 80 inpatients, Riggs et al. (2007) found that *secure* patients were more likely, and dismissing patients were less likely, to have an anxiety diagnosis than other attachment groups. Van Emmichoven, van IJzendoorn, de Ruiter, and Brosschot (2003) reported that, compared to a control group, there were fewer secure participants in the anxiety disordered group in their sample. There were no differences in the distribution of the unresolved attachment between the controls and participants with anxiety disorders.

Several additional studies have explored the relation between attachment disorganization and the presence of specific anxiety disorders in adulthood. The unresolved classification was associated with the presence of a PTSD diagnosis in a sample of Dutch veterans (Harari et al., 2009), as well as with a greater likelihood of comorbid anxiety and PTSD in a sample of Vietnam combat veterans (Nye et al., 2008). Finally, among women with a history of childhood abuse, unresolved states of mind were associated with more comorbid anxiety disorders and with increased likelihood of a PTSD diagnosis, specifically (Stovall-McClough & Cloitre, 2006). In sum, in contrast to the adult literature, previous literature has not thoroughly explored the relation between anxiety disorders and disorganization in attachment relationships in adolescence. Therefore, very little is known about the link between anxiety disorders and attachment disorganization in late adolescence, during this critical period of transition to more autonomous functioning outside the family.

1.2. Anxiety disorders and dysfunction in peer relationships

Given that adolescence is a developmental period when youth assert their autonomy away from their family (e.g., Allen & Hauser, 1996), an additional question of interest is whether late adolescents with anxiety disorders have relationship difficulties in social relationships outside the family, including school relationships, friendships, and romantic relationships. In adolescence, peer relationships begin to supplement family relationships, thus, they are critical to adolescent well-being (Sroufe et al., 2005). By age 16, many adolescents report being engaged in a romantic relationship (Carver, Joyner, & Udry, 2003), and by emerging adulthood romantic relationships become increasingly important. Studies have shown that children and adolescents who experience anxiety symptoms are more likely to experience poor peer relationships (e.g., low peer competence, peer rejection or victimization; see Kingery, Erdley, Marshall, Whitaker & Reuter, 2010, for a review). A relatively limited number of studies, however, have assessed peer relationships in clinically anxious youth, and thus little is known about how anxiety disordered late adolescents function in specific social domains (Kingery et al., 2010).

1.3. Anxiety disorders and comorbidity

Anxiety disorders are highly comorbid with depression in both childhood and adulthood and with substance abuse in adulthood (Angold, Costello, & Erkanli, 1999; Costello, Egger, & Angold., 2005; Kessler, Chiu, Demler, & Walters, 2005; Merikangas et al., 1998; see also

Rapee et al., 2009). Although comorbidity of anxiety disorders with other disorders is the norm, many studies have relied on samples that include individuals with anxiety disorders only (e.g., Manassis et al., 1994) or did not examine associations of anxiety disorders in the context of comorbidity with other conditions when participants met criteria for other diagnoses (e.g., Stovall-McClough & Cloitre, 2006). Yet to draw conclusions with meaningful clinical implications, it is important to explore the links between anxiety disorders and social functioning in the context of other comorbid conditions.

1.4. Goals of the current study

The primary goal of this study was to assess the relation between the presence of anxiety disorders and the quality adolescent social relationships, in the context of other comorbidities. Thus, we compared late adolescents with no Axis I diagnosis to a) late adolescents with one or more anxiety disorders and comorbid Axis I conditions, and to b) those without anxiety disorders but with similar comorbid Axis I diagnoses.

We employed a multi-method approach to measuring the quality of primary attachment relationships by using three measures of attachment disorganization: unresolved loss or trauma on the AAI (Main, Goldwyn, & Hesse, 2003), Hostile-helpless representations on the AAI (Lyons-Ruth et al., 2005), and disorganized/controlling behaviors in observed interactions (GPACS, Hennighausen et al., 2011). We hypothesized that late adolescents with anxiety disorders would have higher levels of both unresolved states of mind regarding loss or trauma and higher levels of hostile-helpless representations of attachment relationships compared to those with no Axis I diagnosis. We expected that compared to those with no Axis I diagnosis, late adolescents with anxiety disorders would have higher levels of disorganized interaction patterns characterized by caregiving/role confusion or disorientation, but not higher levels of punitive control, which has been related to externalizing behavior at earlier ages (Moss, Cyr, & Dubois-Comtois, 2004).

Secondly, we evaluated the quality of peer relationships in three specific social domains: friendships, romantic relationships, and school relationships. We hypothesized that late adolescents with anxiety disorders, would experience higher dysfunction in all three social domains compared to those with no Axis I diagnosis.

Since we expected that late adolescents with anxiety disorders would have other Axis I diagnoses, we also examined whether those with other Axis I diagnoses but no anxiety disorders would show elevated levels of dysfunction across the same social domains.

2. Method

2.1. Participants

The sample included 109 late adolescents (66 females and 43 males) and their mothers, with low to moderate family incomes in an urban area in Northeastern US. The 109 adolescents included all those from a larger study sample of 120 participants who had complete diagnostic data on the Structured Clinical Interview for DSM-IV AXIS I (SCID-I, First, Spitzer, Gibbon, & Williams, 1997). Mothers reported the income of the family of origin by checking one of seven income categories, with the lowest category including 5,000 to 10,000/yr and the highest category referring to more than \$60,000/yr (mean range of family of origin income = \$30,000 – \$40,000/yr). In the larger study of 120 families, sixty-four families were first seen in adolescence; 56 families had been followed longitudinally since infancy. The 64 families seen only in adolescence were matched to longitudinal families on adolescent age and ethnicity. The 56 longitudinally studied families were part of a cohort of 76 low-income families recruited during the first 18 months of the child's life, yielding a longitudinal retention rate of 74 % (14% could not be located; 9% refused; and 3% lived

overseas). Attrition was unrelated to eight socioeconomic indices in infancy as well as to all outcome assessments in infancy (effect sizes ϕ or $\eta = -.14$ through $.13$). Half of the families seen in infancy were referred to the study by social service providers due to their concerns about the quality of care provided to the infant; other families seen in infancy did not exhibit problems in infant care (for additional description, see Lyons-Ruth, Connell, Grunebaum, & Botein, 1990). Exclusion criteria for recruitment in infancy were premature birth or physical problems in the first year of life. No specific exclusion criteria were employed for families first seen in adolescence. Families first seen in adolescence were recruited from the same communities through advertisements and they reported no referrals for parenting help in infancy. Thus, sample composition ensured a range of caregiving risk within the sample.

All mothers were biological mothers, except one mother, who was the child's aunt but had raised the child from age 3 months due to the biological mother's death. The mean age for adolescents was 19.9 ($SD=1.45$, range 19 to 23 years). Sixty-seven percent of the adolescents were Caucasian ($n=73$), 35.7% were African-American ($n=28$) and 7.3% were Hispanic ($n=8$). Fifty-nine adolescents lived with their families of origin, six adolescents lived with relatives, eight adolescents lived with significant others, 35 adolescents lived with roommates in apartments or in dorms, and one was in jail.

2.2. Procedure

All procedures were approved by the Hospital Institutional Review Board. Written informed consent was obtained from both parent and adolescent. Adolescents and their mothers participated in a 60- to 90-minute laboratory visit. They were taken to separate rooms to complete interviews and questionnaires assessing psychopathology and their relationships with parents and peers. Adolescents and their mothers also separately completed an Issues Checklist on which they rated sources of disagreement in their relationship. Parent and adolescent could also add their own topics to the suggested list. After both checklists were completed, a topic that was present on both checklists and was highly rated by both mother and adolescent was selected for discussion by a lab assistant and the young adult taped a one-minute statement of his or her position. The parent and adolescent were then reunited for an initial 5-minute unstructured reunion period, followed by the playing of the taped young adult statement and a 10 minute discussion of the topic of disagreement. All interactions were videotaped and later coded as described below. Different coders coded each type of interview or interaction task, and coders were naive to all other data in the study, including the adolescent's diagnostic status, and main hypotheses.

2.3. Measures

2.3.1. Structured Clinical Interview for DSM-IV AXIS I—(SCID-I, First et al., 1997), indicating whether or not participants meet criteria for DSM-IV AXIS I diagnoses, was administered to adolescent participants in the laboratory by an experienced trained clinician with 20 years of mental health clinical practice who received additional training in SCID administration. Including this study, she has conducted over 300 SCID interviews for research studies. The SCID yields reliability kappa's of $.61$ for current diagnosis and $.68$ for lifetime diagnoses, comparable to other structured diagnostic interviews (First et al., 1997).

2.3.2. Adult Attachment Interviews—(AAI, George, Kaplan, & Main, 1996) were also administered to the adolescent participants prior to the interaction task. The AAI is a semi-structured interview designed to elicit a participant's current state of mind regarding attachment experiences with parents and other significant caregivers during childhood. The interviewer asks about the quality of childhood experiences with parents, the participant's responses to experiences of rejection, separation, loss, and trauma during childhood, and the participant's evaluation of the effects of those childhood experiences on his or her current

functioning. In this study, the participants' current state of mind in relation to their parents was assessed.

2.3.2.1. The Adult Attachment Scoring and Classification System: (Main et al., 2003) was used to assign autonomous, preoccupied, dismissing, unresolved, and cannot classify classifications on the AAI. AAIs were coded by two coders who were trained and certified as reliable through the standard Main et al. training procedures. A subset of 15 interviews were coded by both coders to establish inter-rater reliability on the present sample ($\kappa = .62$). Coders were naïve to all other data. For data analysis, the AAI classifications were grouped into a three-level variable indexing overall insecurity/disorganization of attachment [1 = autonomous/secure; $n = 43$; 2 = organized insecure (i.e., dismissing or preoccupied), $n = 45$ (n dismissing = 35 and n preoccupied = 10); 3 = unresolved or cannot classify, $n = 21$]. The Adult Attachment Scoring and Classification System for the AAI has good stability over time, good validity in relation to measures of psychopathology, measures of parenting, and quality of infant attachment, and discriminant validity has been demonstrated with respect to memory, intelligence, cognitive complexity, and social adjustment (see Hesse, 2008 for a review).

2.3.2.2 Hostile/Helpless representations of attachment relationships: The AAI was also coded using the Hostile-Helpless (HH) coding system (Lyons-Ruth et al., 2005), which assesses pervasively unintegrated positive and negative evaluations of childhood attachment relationships on a 1 to 9 scale [1 = no evidence of HH, 9 = high levels of HH, $M(SD) = 4.69 (1.64)$]. Transcripts coded higher on the Hostile-Helpless scale are characterized by evidence of opposing evaluations of primary attachment relationships occurring across the interview that are neither discussed nor reconciled by the participant, e.g., “We were friends... We were enemies.” The intraclass correlation on 15 randomly selected transcripts was .83. Validity has been established in relation to childhood trauma, disrupted parenting, and disorganized infant attachment. Additional detail is available elsewhere describing coding criteria and detailing how this coding system differs from and extends the Main et al. (2003) coding system for the AAI (Lyons-Ruth, Yellin, Melnick, Atwood, 2003; Lyons-Ruth et al., 2005).

2.3.3. Goal-Corrected Partnership in Adolescence Coding System (GPACS)— Videotaped interactions were coded using the GPACS (Hennighausen et al., 2011). The GPACS includes ten scales as follows: Collaborative Communication indexing cooperative goal-corrected partnership; Caregiver Validation of Adolescent's Voice that indexes the caregiver's support for the adolescent's self-expression; and eight scales that index three major subtypes of disorganized interaction, including punitive, caregiving/role -confused, and disoriented behavior. These eight scales are: 1) parental punitive behaviour (e.g., mother making angry, hurtful, or mocking comments about the adolescent, 2) adolescent punitive behaviour (e.g., adolescent making angry, critical, or mocking comments about the parent; sharply dictating how the parent should behave), 3) adolescent disoriented/distracted behavior (e.g., assuming a trance-like posture or expression (“freezing”); pausing abruptly in mid-sentence; closing eyes for prolonged periods), 4) parental disoriented/distracted behavior, (e.g. same as adolescent disoriented behavior), 5) adolescent odd, out-of context behavior (e.g., using a forced, high-pitched, or childish tone of voice; chanting or making repetitive comments; shifting into unusual, fantasy-based topics; stiff, stilted, or mistimed gestures), 6) parental odd, out-of-context behaviour (e.g., using a forced, high-pitched, or childish tone of voice; wandering aimlessly around the room; unusual shifts away from the topic; stiff, stilted, or mistimed gestures), 7) adolescent caregiving (e.g., attempting to manage, take care of, and/or appease the parent by offering guidance, organizing the task, and/or providing entertainment such as silly jokes; coy/flirtatious behaviors), and 8) parental

role-confusion (e.g., making comments about feeling inadequate, uncertain, or helpless; asking for advice on topics more typically discussed with partner or other adult (personal relationships, discipline of siblings). Intraclass correlations between two coders, naïve to all other data, ranged between .75 – .96 ($n = 16$). Confirmatory factor analyses of the ten scales confirmed a four-factor model: a factor indexing collaboration in interactions and three factors indexing types of disorganization including punitive, role-confused/caregiving, and disoriented behavior CFI = .969; TLI = .942; RMSEA = .060, 90% CI (.065 – .076) (Obsuth, Hennighausen, Brumariu, & Lyons-Ruth, in press). Only the three factors indexing disorganization were used in this study, [Ms (SDs) = 3.29 (1.26), 4.41 (1.64) and 3.24 (1.53) for punitive, disoriented and caregiving/role confused, respectively]. The GPACS has shown validity in relation to disorganized attachment classification in infancy, to attachment classification on the AAI at age 25, and to parent and adolescent self-reports of role-confusion (Hennighausen et al., 2011; Obsuth et al., in press).

2.3.4. The Adult Personality Functioning Assessment—(APFA; Hill, Harrington, Fudge, Rutter, & Pickles, 1989) is a semi-structured interview which inquires about functioning over four to six-year time periods in the domains of work/school, romantic relationships, and friendships. The interviewer uses flexible questioning to obtain information and make ratings on the basis of detailed rating rules, a dictionary of examples, and training. Ratings are made for each domain on scales from 1 – 6 where “1” reflects a high level of adaptation and “6” reflects very poor functioning. Scoring was conducted using the Adolescence to Adult Personality Functioning (ADAPFA) scoring system which has been designed for late adolescence (Naughton, Oppenheim, & Hill, 1996). The APFA has good inter-rater reliability and subject-informant agreement (Hill et al. 1989, Hill, Fudge, Harrington, Pickles, & Rutter, 1995). In this study, interviews covered the period from 14 to 19 years of age and three distinct domains: friendships ($M = 3.29$, $SD = 1.05$), romantic relationships ($M = 4.25$, $SD = 1.23$), and school relationships ($M = 3.75$, $SD = 1.42$). Intraclass correlations among coders ranged from .80 to 1.00 (n tapes = 12).

2.4. Missing data on social functioning variables

In the present sample, the rate of missing information on social functioning variables ranged from 0 % to 4.6 %. Specifically, the GPACS variables had a 4.6% rate of missing data, and APFA had rates of 2.8% for the quality of romantic relationships and 1.8% for the quality of friendships and school relationships. These data were missing due to technical difficulties or participants becoming tired with the protocol. For a rate of missing information of 4.6%, five data sets were generated, yielding excellent efficiency to detect a significant effect of 99% according to Rubin's (1987) guidelines. The data were imputed through the Markov Chain Monte Carlo procedure (MCMC; Gilks, Richardson, & Spiegelhalter, 1995), using SPSS version 19 software. Results with missing and imputed data yielded similar results. Power analysis using G*Power program indicated that based on a sample of 109 participants, there is 97% power to obtain an effect size of .4. (Faul, Erdfelder, Lang, & Buchner, 2007).

3. Results

3.1. Descriptive data

Thirty participants did not meet criteria for any Axis I disorders (30% male), 44 participants met criteria for at least one anxiety disorder (48% male), and 35 participants met criteria for other Axis I disorders, but not for an anxiety disorder (37% male). Thus, outcomes were assessed for these three groups: the No Axis I diagnoses group, the other Axis I diagnoses group, and the Anxiety disorders group.

Participants in the anxiety disorders group met diagnostic criteria for one or more anxiety disorders, including Panic Disorder ($n = 4$), Social Phobia ($n = 16$), Obsessive-Compulsive Disorder ($n = 2$), Generalized Anxiety Disorder ($n = 10$), Post-Traumatic Stress Disorder ($n = 3$), Agoraphobia ($n = 2$), Anxiety Disorder Not Otherwise Specified ($n = 8$), and Specific Phobia ($n = 15$). Ten participants met diagnostic criteria for only one anxiety disorder, and did not have other comorbid Axis I diagnoses. Ten participants experienced more than one anxiety disorder and these 10 participants also had other Axis I comorbid diagnoses. In total, thirty-four participants with anxiety disorders also met criteria for other comorbid Axis I disorders. Other Axis I diagnoses among participants with anxiety disorders and without anxiety disorders are shown in Table 1. Given the low-income nature of this sample, as well as the over-sampling of caregiving risk in the longitudinal cohort, it is not surprising that the rates of anxiety disorders, as well as those of other Axis I diagnoses, are higher than those reported in epidemiological studies (see Kendall et al., 2006; Rudolph, Hammen, & Daley, 2006 for reviews). For example, in epidemiological studies, prevalence rates for panic disorder, obsessive-compulsive disorder, and posttraumatic stress disorder range from $< 1\%$ to 2% , and prevalence rates for generalized anxiety disorder are about 1% (Kendall et al., 2006), which are lower than those found here (i.e., in this sample, prevalence rates were 3.67% for panic disorder, 2.75% for posttraumatic stress disorder, and 9.17% for generalized anxiety disorder). Consistent with epidemiological studies, the rate for obsessive compulsive disorder in this sample was 1.84% . In agreement with our data, studies show phobias to be the most common anxiety disorder in adolescence (Kendall et al., 2006).

3.2. Preliminary analyses

Preliminary analyses investigated whether the adolescent's age, gender, ethnicity, or family income were related to the attachment, social domain dysfunction, or anxiety disorder variables. None of the demographic variables (adolescent's age, gender, and ethnicity or family income) were related to the presence of anxiety disorders [i.e., diagnostic status; for adolescent age, $F(2, 106) = .16, p > .05$; for family income, $F(2, 106) = .40, p > .05$; for ethnicity and gender, $\chi^2(2) = 4.35$ and $\chi^2(2) = 2.46$, respectively, $p > .05$]. In regard to the relation between age and social functioning variables, we found only two significant relations for attachment: participants who were older were rated less punitive and disoriented in their interactions with their mothers on the GPACS ($r = -.25, p < .01$, and $r = -.21, p < .05$). Age was not related to dysfunction in peer relationship variables (r s ranged between $-.07$ and $-.11$, all p s $> .05$). Males had more difficulties in school relationships than females (M s = 4.07 and 3.51 , respectively, $t(107) = -2.19, p < .05$), but no other comparisons were significant. Family income was related to several variables: overall insecurity/disorganization on the AAI ($r = -.41, p < .001$), the extent of hostile/helpless representations on the AAI ($r = -.21, p < .05$), disorientation in interaction on the GPACS ($r = -.31, p < .01$), role confusion in interaction on the GPACS ($r = -.21, p < .05$), friendship dysfunction on the APFA ($r = -.27, p < .01$) and school relationships dysfunction on the APFA ($r = -.37, p < .001$). Ethnicity was unrelated to study variables. All demographic variables related significantly to social functioning variables were controlled in relevant analyses.

Table 2 includes zero-order correlations among attachment variables and zero-order correlations between the attachment and peer relationships variables. Indices of disorganization were modestly correlated, suggesting that they measure somewhat different aspects of disorganization and complement one another. Associations between measures of attachment disorganization in relation to parents and domains of social dysfunction in relation to peers ranged from low to medium.

3.3. Anxiety disorders and mother-child attachment disorganization

In order to maximize power and reduce Type I error, orthogonal contrast analyses were conducted to investigate whether there were differences in the quality of social functioning associated with the two contrasts of interest: a) No Axis I Disorders vs. Anxiety Disorders and b) No Axis I Disorders vs. Other Axis I Disorders (consisting predominantly of depressive disorders and substance abuse, Table 1). Means for each diagnostic group, adjusted for covariates when relevant, as well as the results of the contrast analyses corresponding to the main hypotheses, are presented in Table 3.

3.3.1. Overall insecurity/disorganization of attachment—Adolescents with anxiety disorders had higher levels of overall insecurity/disorganization than did those with no Axis I diagnosis. Adolescents in the Other Axis I diagnoses group did not differ significantly on overall insecurity/disorganization from those with no Axis I diagnosis.

3.3.2. Hostile-helpless representations of attachment relationships—Anxiety-disordered adolescents had higher levels of hostile-helpless indices in their representations of attachment relationships than those with no Axis I diagnosis. Adolescents in the Other Axis I Diagnoses group did not differ from those with no Axis I diagnosis on hostile-helpless indices.

3.3.3. Observed mother-adolescent interaction—Anxiety disordered adolescents had higher levels of disorientation in their interactions with their mothers than did those with no Axis I diagnosis. Adolescents with Other Axis I diagnoses did not differ significantly from those with no Axis I diagnosis. Neither anxiety-disordered adolescents nor adolescents with Other Axis I diagnoses differed in their level of punitive behavior or caregiving/role confused behavior compared to adolescents with no Axis I diagnosis (see Table 3).

3.4. Anxiety disorders and dysfunction in peer relationships

Anxiety-disordered adolescents had higher levels of dysfunction in friendships, romantic relationships, and school relationships than adolescents with no Axis I diagnosis. Adolescents with Other Axis I diagnoses also had higher levels of dysfunction in the school domain, but not in the friendship or romantic relationship domains, than did those with no Axis I diagnosis.¹

4. Discussion

Theory suggests a close link between anxiety disorders and the quality of attachment relationships (Bowlby, 1973), but only a few studies have addressed the relation between the presence of anxiety disorders and attachment disorganization (Brumariu & Kerns, 2010a). The current report represents a step forward in filling this gap in the literature. This study expands upon previous research by examining whether the presence of anxiety disorders is associated with the quality of mother-child attachment disorganization in a sample of late adolescents, using multi-method assessments that capture both representations and behaviors central to attachment disorganization. Peer relationships are also of critical importance in late adolescence (Sroufe et al., 2005), and this study adds to the literature by investigating whether adolescents with anxiety disorders experience dysfunction in three peer domains: friendships, school relationships, and romantic relationships. Further, we addressed these

¹Post-hoc tests for the additional non-orthogonal comparisons between the other Axis I diagnoses group and the anxiety-disordered group yielded a mixed pattern of results. Despite consistently higher means for the social relationship variables in the Anxiety Disorder and comorbid conditions group compared to means in the Other Axis I diagnoses group, the only significant difference was on the Hostile/Helpless representations of attachment measure ($p = .02$).

questions in a sample in which anxiety disorders co-occurred with other psychiatric diagnoses, as is typical for these diagnoses (Costello et al., 2005).

As predicted, late adolescents with anxiety disorders and comorbid conditions had higher levels of overall insecurity/disorganization and hostile-helpless states of mind than those with no Axis I diagnosis. These findings extend previous literature reporting an association between anxiety disorders and unresolved states of mind on the AAI in older samples (Fonagy et al., 1996, Manassis et al., 1994) by investigating these relations in late adolescence. In addition, hostile-helpless indicators have not previously been assessed in relation to anxiety disorders and results demonstrate that adolescents with anxiety disorders are also showing increased difficulty integrating positive and negative evaluations of attachment figures.

Also unique to this study is the incorporation of a behavioral measure of parent-adolescent attachment disorganization, assessing three patterns of disturbed interaction with the parent in the context of a discussion of a conflict in their relationship. Anxiety-disordered adolescents exhibited higher levels of disorientation in those discussions compared to adolescents with no Axis I diagnosis. The disoriented and odd, out-of-context behaviors exhibited by these adolescents are analogous to the contradictory and out-of-context behaviors characteristic of disorganized attachment in infancy (Hennighausen et al., 2011). In infancy, disorganized behavior is thought to arise because the caregiver, who should be the source of comfort, is unable to provide comfort and may even be a source of fear (Lyons-Ruth & Jacobvitz, 2008). These findings indicate that adolescents with anxiety disorders are unable to organize their behaviors effectively in interactions with their attachment figures.

We also found that adolescents with anxiety disorders had higher levels of dysfunction in the peer domains of friendship relationships, romantic relationships, and school relationships than those with no Axis I diagnosis. A relatively small number of studies have evaluated the peer relationships of clinically anxious youth (see Kingery et al., 2010, for a review) and our study adds to this scarce literature. In addition, our study is one of the first to differentiate the quality of functioning in three specific domains of peer relationships. Our findings converge with previous research that has demonstrated that anxious youths are more likely than controls to anticipate negative outcomes for social situations and to show more negative social cognitions during interactions with peers (Kingery et al., 2010). Given the concomitant difficulty in primary attachment relationships found in this study, adolescents with anxiety disorders might be expected to be less equipped to participate in close social relationships involving trust and confiding, thus being at a particular disadvantage in developing intimate peer friendships and romantic relationships (Booth-LaForce & Kerns, 2008).

We also examined whether adolescents in the Other Axis I diagnoses group, who predominantly exhibited substance abuse and depression, would also show lower quality of mother-adolescent and peer relationships than adolescents with no Axis I diagnosis. No significant differences between these two groups emerged on any of the attachment disorganization variables. In relation to peers, the only domain in which adolescents in the Other Axis I diagnoses group exhibited higher levels of dysfunction than those with no Axis I diagnosis was in the domain of school relationships.

Although we did not find differences in attachment disorganization between adolescents in the Other Axis I Diagnoses group and those with no Axis I diagnosis, it will be important to clarify further the complex relations between attachment in adolescence and other Axis I psychopathology, an underdeveloped area in the literature. Diagnoses in this group were

varied, so that studies focusing on individual diagnosis might yield different results. In addition, the relations found in the current study between anxiety disorders and quality of attachment and peer relationships do not rule out other influences on anxiety disorders (Brumariu & Kerns, 2010a). Future studies should evaluate the relations between anxiety disorders and relationship quality in the context of other potentially important factors, including temperament and genetic factors.

Although not the main focus of this study, the modest links between quality of functioning in parent and peer relationships deserve comment. There were a number of significant but generally small to medium associations among the indicators of functioning in parent-child and peer relationships, suggesting that these are not redundant assessments. To capture the overall quality of social functioning associated with anxiety disorders, it is important to include assessments of multiple social domains. Interestingly, we did not find gender differences in anxiety disorders in this higher-risk cohort. Although previous studies have shown that girls are more likely than boys to experience an anxiety disorder, the literature is not entirely consistent (Costello et al., 2005). In addition, our nonsignificant results may be due to our smaller sample size.

Although this study contributes to the further understanding of the relations between anxiety disorders and functioning in close relationships, limitations should also be noted. We assessed constructs of interest at a single time point, so that direction of causality cannot be determined. While Bowlby (1973) proposed that attachment relationships might play an etiological role in generating high levels of anxiety, it is also likely that higher levels of anxiety will have a negative effect on both parent-child relationships and peer relationships. Longitudinal studies and randomized intervention designs are necessary to disentangle possible bidirectional effects. While this study focused on attachment disorganization, there is some evidence that ambivalent attachment might be related to anxiety and internalizing problems (Brumariu & Kerns, 2010a, Colonnesi et al., 2011). The examination of the relation between ambivalent attachment and anxiety disorders was hampered in this study, as in other studies, by the low rate of ambivalent attachment in Western societies (Bakermans-Kranenburg, M.J. & IJzendoorn, 2009). It will be important to investigate this relation in late adolescence in future studies. In addition, although the AAI provides information regarding the current state of mind in relation to both parents, the GPACS scores reflect attachment with mothers only, and future studies should address this issue by investigating father-adolescent attachment as well. Literature suggests that quality of attachment influences the quality of peer relationships (Booth-LaForce & Kerns, 2008), and future studies should evaluate whether anxiety-disordered adolescents have poorer peer relationships due to poor quality of attachment with parents. Further, the adolescents with anxiety disorders studied here had other comorbid Axis I conditions. While this is the norm among anxiety-disordered individuals (e.g., Costello et al., 2005), the literature would also benefit from comparing the relationship quality of individuals with anxiety disorders only to the relationship quality of individuals with anxiety disorders and comorbid conditions. The number of participants in our sample meeting diagnostic criteria for an anxiety disorder only was small and precluded such analyses. In addition, studies with larger sample sizes should investigate if there are consistent differences between participants with Anxiety Disorders and comorbid conditions and those with Other Axis I disorders only. For example, it would be important to investigate whether experiencing anxiety disorders is more specifically related to dysfunctions in attachment-like peer relationships (friends, romantic partners), while quality of less intimate school-related relationships is linked to a more diverse array of disorders, including anxiety disorders as well as depression, substance abuse, and other Axis I conditions. Finally, our anxiety disorders group included a range of anxiety disorder diagnoses. Future studies should investigate whether the relations found here between anxiety disorders and attachment disorganization or peer dysfunction are different for

different types of anxiety disorders. For example, given the poor quality of interpersonal relationships found in samples of socially anxious children (Kingery et al., 2010), there is a possibility that the presence of social phobia rather than other anxiety disorders might be more relevant for attachment and peer relationships.

Our results have implications for treatment programs for adolescents with anxiety disorders. While few treatments have been designed solely for the adolescent period (Kendall et al., 2006), the literature provides empirical support for cognitive behavioral therapy (Chorpita et al., 2011; Silverman, Pina, & Viswesvaran., 2008; Rapee et al., 2009). Despite these findings, a significant proportion of adolescents do not improve following state-of-the-art treatments (Rapee et al., 2009). Our results support the importance of investigating whether targeting dysfunctions in close relationships and enhancing the quality of relationships of youth experiencing anxiety disorders improves treatment outcome, particularly when included in therapies that have received empirical support.

In summary, across three independent and well-validated measures of attachment disorganization, late adolescents with anxiety disorders showed higher levels of disorganized attachment representations and behaviors, as well as poorer functioning in peer friendships and romantic relationships than those with no Axis I diagnosis. Among adolescents with other Axis I diagnoses, consisting predominantly of depressive disorders and substance abuse, such differences did not emerge. Thus, the present results suggest that adolescents with anxiety disorders may be especially prone to impairments in attachment and peer relationships.

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Highlights

- We examined attachment and peer relationships of anxiety-disordered adolescents.
- Anxiety-disordered adolescents had higher levels of attachment disorganization.
- They had higher dysfunction in peer relationships than those with no diagnosis.
- Adolescents with other disorders did not differ much from those with no diagnoses.

Table 1

Other Axis I diagnoses among participants with and without anxiety disorders.

Diagnoses	Anxiety Disorders n = 44	Other Axis I Diagnoses n = 35
Depressive disorders	20 (45%)	15 (43%)
Bipolar disorder	3 (7%)	5 (14%)
Substance abuse disorders	23 (52%)	19 (54%)
Eating disorder	2 (5%)	2 (6%)
Somatoform disorder	1 (2%)	1 (3%)

Table 2

Associations among assessments of parent and peer relationships

Variables	2	3	4	5	6	7	8
	HH	Pun	Dis	CG	Fr	RR	School
1. Overall insecurity/disorganization (AAI)	.28**	.16	.26**	.16	.27**	.26**	.45***
2. Hostile/helpless representations (AAI)		.22*	.14	.14	.35***	.11	.39***
3. Punitive interaction (GPACS)			.26**	.30**	.03	.11	.17
4. Disoriented interaction (GPACS)				.30**	.22*	.25**	.20*
5. Caregiving/Role confused interaction (GPACS)					.20*	.33**	.17
6. Dysfunction in friendships (APFA)						.45***	.47***
7. Dysfunction in romantic relationships (APFA)							.23*
8. Dysfunction in school relationships (APFA)							

* $p < .05$,

** $p < .01$,

*** $p < .001$

Table 3
 Orthogonal contrasts between adolescents with no Axis I diagnosis and those with Anxiety Disorders or Other Axis I diagnoses.

Variables	Diagnostic category			Contrasts	Contrast estimate (SE)	Significance
	No Axis I diagnosis (A)	Other Axis I diagnoses (B)	Anxiety disorders (C)			
Overall insecurity/disorganization ^a (AAI)	1.53 (.12)	1.84 (.11)	1.95 (.10)	A v C	.42 (.16)	<i>p</i> = .009
Hostile/Helpless representations ^a (AAI)	4.07 (.28)	4.47 (.26)	5.29 (.23)	A v B	.31 (.17)	<i>p</i> = .ns
				A v C	1.22 (.36)	<i>p</i> = .001
Punitive interaction ^a (GPACS)	3.30 (.23)	3.21 (.21)	3.39 (.19)	A v B	.41 (.38)	<i>p</i> = ns
				A v C	.09 (.29)	<i>p</i> = ns
Disoriented interaction ^a (GPACS)	3.93 (.28)	4.52 (.26)	4.70 (.23)	A v B	-.09 (.31)	<i>p</i> = ns
				A v C	.77 (.36)	<i>p</i> = .036
Caregiving/role confused interaction ^a (GPACS)	2.92 (.28)	3.38 (.26)	3.37 (.23)	A v B	.59 (.37)	<i>p</i> = ns
				A v C	.50 (.36)	<i>p</i> = ns
Dysfunction in friendships ^a (APFA)	2.89 (.19)	3.39 (.18)	3.43 (.15)	A v B	.50 (.32)	<i>p</i> = ns
				A v C	.53 (.24)	<i>p</i> = .029
Dysfunction in romantic relationships (APFA)	3.83 (.22)	4.31 (.21)	4.48 (.18)	A v B	.49 (.25)	<i>p</i> = ns
				A v C	.66 (.29)	<i>p</i> = .027
Dysfunction in school relationships ^a (APFA)	3.15 (.22)	3.98 (.20)	3.93 (.18)	A v B	.48 (.30)	<i>p</i> = ns
				A v C	.78 (.28)	<i>p</i> = .007
				A v B	.82 (.29)	<i>p</i> = .006

^a adjusted means after controlling for covariate(s)