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# Can attachment and peer relation constructs predict anxiety in ethnic minority youths? A longitudinal exploratory study

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**ABSTRACT**

Anxiety is the most prevalent psychiatric disturbance in childhood effecting typically 15–20% of all youth. It has been associated with attachment insecurity and reduced competence in peer relations. Prior work has been limited by including mainly White samples, relying on questionnaires, and applying a cross-sectional design. The present study addressed these limitations by considering how at-risk non-White youth ($n = 34$) responded to the Friends and Family Interview (FFI) in middle childhood and how this linked up with anxiety symptoms and an anxiety diagnosis three years later in early adolescence. Five dimensions of secure attachment, namely, (i) to mother, (ii) to father, (iii) coherence, (iv) developmental understanding, and (v) social competence and quality of contact with best friend in middle childhood, were found to correlate significantly (and negatively) with self-reported anxiety symptoms. Linear regression results showed independent influences of female gender, and (low) quality of best friend contact as the most efficient model predicting anxiety symptoms. Logistic regression results suggested a model that included female gender, low social competence, and immature developmental understanding as efficient predictors of an anxiety diagnosis, evident in only 18% of the sample. These results point to the usefulness of after-school programs for at-risk minority youth in promoting peer competence, developmental awareness, and minimizing anxiety difficulties.

While estimates of anxiety disorders among children and adolescents vary as a result of method variance, there is agreement as to their high prevalence (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003; Curry, March, & Hervey, 2004) with a recent systematic review suggesting lifetime prevalence rates for children and adolescents to be 15–20% (Beesdo, Knappe, & Pine, 2009). Although anxiety levels are only moderately stable across childhood (Bosquet & Egeland, 2006; Kerns, Siener, & Brumariu, 2011), a significant minority of anxiety disorders persist into adulthood (Costello, Copeland, & Angold, 2011; Gregory et al., 2007). Research on risk factors for the development of clinical levels of anxiety often focuses on the role of the family and most theoretical models include

parent–child interactions as either ameliorating or maintaining anxiety in the child (e.g. McLeod, Wood, & Avny, 2011; Murray, Creswell, & Cooper, 2009). Some of these models also include the attachment relationship between parent and child (e.g. Esbjørn, Bender, Reinholdt-Dunne, Munck, & Ollendick, 2012; Ginsburg, Siqueland, Masia-Warner, & Hedtke, 2004; Nolte, Guiney, Fonagy, Mayes, & Luyten, 2011). The present study empirically explored links between responses to an attachment interview at 10 years of age and anxiety levels three years later, within a vulnerable urban sample participating in an after-school program.

## Attachment classification as a predictor of anxiety

Although differences between studies exist, attachment insecurity is generally reported to be associated with anxiety in children and adolescents (Bögels & Brechman-Toussaint, 2006). Some studies applying the tripartite categorical model (Secure, Ambivalent, and Avoidant; Ainsworth, Blehar, Waters, & Wall, 1978) highlight the unique influence of ambivalent attachment in infancy on the later development of anxiety (Warren, Huston, Egeland, & Sroufe, 1997). A meta-analysis examining the association between ambivalent attachment and anxiety reported an overall moderate association ($r = .37$; Colonnesi et al., 2011). Other papers included disorganized attachment in their analyses but question this association and suggest that the disorganized attachment pattern is the most salient risk-factor for the development of anxiety (Brumariu & Kerns, 2010). The above-mentioned findings are based on attachment data from different sources, not only observational studies of infants, but also self-report or parent-reported measures, which may have implications for the validity of the conclusions reached (Groh, Roisman, van IJzendoorn, Bakermans-Kranenburg, & Fearon, 2012). A recent meta-analysis, including data from more than 4000 children, which assessed the influence of observational-based attachment security in infancy on the development of internalizing disorders, found support for the association between insecurity and internalizing symptoms, but the association was weak (Cohen's $d = .15$). However, in contrast to existing beliefs, it was the avoidant pattern ($d = .17$), not the resistant or disorganized attachment patterns, that uniquely predicted internalizing symptomatology (Groh et al., 2012). Although compelling, the meta-analysis still has limitations. First, only 6.4% of the included children suffered from clinical levels of internalizing symptoms. Secondly, almost no studies included data obtained on clinical youths' self-report on symptomatology; rather, the majority of the studies were based on parental report on a broad range of measures of behavior. These limitations may compromise the conclusions drawn in regard to children suffering from clinical levels of anxiety.

Most of the existing studies examining the association between attachment and clinical levels of anxiety in childhood apply cross-sectional designs and questionnaire-based measures of attachment. There are, however, a few exceptions. One of these examining behaviorally inhibited children did not find attachment at four years of age to predict anxiety at nine years of age, when controlling for baseline anxiety (Hudson & Dodd, 2012). Although this study applied the Strange Situation Procedure (SSP; Ainsworth et al., 1978), the first contact with the children was at four years of age. In contrast, the two most prominent of the longitudinal studies in the field, namely the Minnesota Longitudinal Study of Parents and Children (e.g. Bosquet & Egeland, 2006; Sroufe, 2005; Warren et al.,

1997) and the NICHD Study of Early Child Care (e.g. Brumariu & Kerns, 2013; Kerns et al., 2011), followed children from infancy. Both studies measured attachment in infancy using the SSP, and continued to follow the children through middle childhood or adolescence.

The Minnesota study reported that being ambivalently attached to the mother in infancy doubled the risk of developing an anxiety disorder in adolescence, although this was only the case for 28% of the adolescents, who had been ambivalently attached as infants ($n = 9$; Warren et al., 1997). Later mediation analyses of this Minnesota sample revealed that insecure attachment in infancy uniquely predicted negative peer relationship representations in pre-adolescence which in turn predicted anxiety symptoms in adolescence (Bosquet & Egeland, 2006).

The NICHD Study of Early Child Care, on the other hand, found that ambivalent attachment at 15 and 36 months of age was *not* related to anxiety symptoms in middle childhood, however, disorganized attachment (Brumariu & Kerns, 2013) and child-perceived attachment insecurity at 54 months of age were related to anxiety symptoms (Kerns et al., 2011). Furthermore, mediational analyses revealed that both avoidant and disorganized attachment in infancy were associated with lower levels of peer competence which, in turn, was associated with elevated levels of anxiety. Disorganized attachment was also associated with lower levels of emotion regulation abilities, which also mediated the relation between attachment and anxiety (Brumariu & Kerns, 2013).

Despite the thoroughness of the studies, unanswered questions remain. First, the assessment of anxiety symptoms was based on a selection of items from a wide-ranging assessment tool measuring internalizing disorders, externalizing disorders, and a number of other emotional and behavioral problems. It is unclear if similar results would have been found had they used a DSM-based anxiety measure. Second, the studies do not report whether the findings also hold true for minority samples, for whom little is known about the influence of attachment on the development of anxiety. We do know, however, that racial and ethnic minorities are often at greater risk of not receiving mental health services, or of receiving less adequate treatment than other mental health patients (Snowden, Masland, Ma, & Ciemens, 2006). This raises the question, and the need for a fuller understanding, of whether similar developmental routes to anxiety exist in minority groups. Third, past studies have typically assessed attachment in infancy or early childhood. As attachment is only moderately stable across childhood and adolescence (Fraley, 2002), there may be a greater, and certainly more proximal, impact of attachment in middle childhood upon the development of anxiety in adolescence. However, with respect to attachment in middle childhood, questions arise as to the multiple social and emotional dimensions of attachment at this developmental stage. For example, attachment classifications per se (binary, tripartite, and even four-way) may not sufficiently capture the variety of influences operating within the domain of attachment in middle childhood. It may be that interview-based ratings of constructs underlying diverse aspects of attachment (e.g. to mother, to father) and peer relations reveal a fuller understanding of how attachment in middle childhood is linked with anxiety in adolescence, especially in a sample burdened by considerable adversity. This is the central question informing the work reported in this paper.

## Attachment constructs in middle childhood and anxiety

Within the attachment literature, studies have shown that attachment security is related to the establishment of a *secure base/safe haven* to mother and/or father, i.e. a belief within the child that the parent will function as a secure base from which the child may confidently venture off and explore the world, and to which the child should feel free to return if unduly distressed (Bowlby, 1973). In middle childhood, secure attachment may be displayed in the related concept of coherence (Steele & Steele, 2005). A distinct but related construct is reflective functioning (RF; Steele, Steele, & Kriss, 2009). RF comprises the capacity to understand oneself and others as motivated by internal mental states such as feelings, beliefs, intentions, and desires (Fonagy, Target, Steele, & Steele, 1998), and is associated with a reduced risk of developing psychopathology, e.g. anxiety. High RF includes being able to hold a *developmental perspective*, which is a discrete cognitive and emotional skill demonstrated by many children in middle childhood. A developmental perspective is characterized by a clear focus on the present, an appreciation for how the present is influenced by the past, and an appreciation for how the future may bring unavoidable (or welcome) developmental changes.

## Peer relations in middle childhood, attachment, and anxiety

As children reach middle childhood and adolescence, influences stemming from friends and peers increase (Lieberman, Doyle, & Markiewicz, 1999). Research has shown that secure attachment to parents is related to social and peer competences such as overall friendship quality, popularity, and social acceptance (Kerns, Klepac, & Cole, 1996; Lieberman et al., 1999). A meta-analysis including 63 studies reported this effect to be small to moderate (Schneider, Tardif, & Atkinson, 2001). Some studies suggest that concurrent peer relations may overall be more important for psychological adjustment in adolescence than early parental attachment relationships (Laible, Carlo, & Raffaelli, 2000). It has also been suggested that peer relations may provide compensatory relationships in youths, who do not receive emotional support within the family (Wilkinson, 2004). This latter suggestion has, however, been questioned by Rosenthal and Kobak (2010). They reported that youths who place higher importance on peer relations compared to relations to parents were at higher risk of experiencing elevated levels of externalizing and internalizing problems (Rosenthal & Kobak, 2010). These findings merit further study of the association between attachment and peer relations.

Peer relations have also been shown to be related to internalizing disorders. One longitudinal study reported internalizing disorders in middle childhood to be significantly related to social difficulties, including poor peer acceptance, social isolation, and perceptions of social incompetence (Hymel, Rubin, Rowden, & LeMare, 1990). Furthermore, La Greca and Harrison (2005) found that positive qualities in best friendships protected against social anxiety in adolescents. However, studies examining the influence of peers in youths suffering from anxiety disorders are warranted before firm conclusions can be drawn (Kingery, Erdley, Marshall, Whitaker, & Reuter, 2010).

## Purpose of the present study

The aim of the present exploratory study was therefore to address how attachment and peer related constructs in middle childhood (Time 1), may contribute to anxiety in early adolescence, three years after an initial interview assessment (Time 2). We assessed a high-risk ethnic minority sample of youths in a longitudinal design at two time points from middle childhood to adolescence. We interviewed youths to assess constructs underlying attachment (Secure base/safe haven to mother and Secure base/safe haven to father, Developmental perspective and Coherence) and peer relations (Quality of best friend contact and Social competence) at Time 1, and self-reported levels of DSM-based anxiety symptoms using a questionnaire and a clinical interview at Time 2.

We tested three hypotheses: (i) Secure base/safe haven to mother and Secure base/safe haven to father at Time 1 would be associated with less anxiety at Time 2; (ii) High levels of Developmental perspective and Coherence at Time 1 would be associated with less anxiety at Time 2; and (iii) High levels of Social competence and high Quality of best friend contact at Time 1 would be associated with less anxiety at Time 2. Due to the exploratory nature of the study, we did not have a hypothesis regarding unique contributions from both or one specific construct. As female gender has been associated with elevated levels of anxiety in adolescence (Rapee, Schniering, & Hudson, 2009), we included gender to control for this influence. In line with previous research, all three hypotheses were tested with regard to (a) anxiety symptoms and (b) the presence of an anxiety diagnosis. This latter approach was chosen as youths with anxiety disorders may be categorically different from youths with non-clinical levels of anxiety, and therefore may be influenced by different risk and protective factors (Bosquet & Egeland, 2006). As this study, to our knowledge, is the first of its kind to assess these attachment and peer relation constructs during middle childhood in an ethnic minority sample, it is exploratory in nature, despite our hypotheses concerning the possible influence of these constructs on non-clinical symptom level and pathological anxiety.

## Methods

### Procedures and participants

The study was approved by the University's ethical review board, and was performed in accordance with existing ethical standards. Participating youths all attended the "I Have A Dream" Foundation-New York (IHDF-NY) after-school program (www.ihaveadreamny.org). The program aims to motivate and empower children living in low-income communities to reach their educational and career potential by providing a long-term program of academic support, mentoring, enrichment, and tuition assistance for higher education. The program builds on attachment theory and provides an after-school "shelter" where adults provide a sensitive and caring environment resembling the secure base between parent and child. "Dreamers" had been included in the program during their first four years of school. The majority of the children were living in public housing at the time of enrollment. Parents had given written informed consent for their child to be part of the ongoing research activities at this particular IHDF-NY site, and information on the specific activities was provided to the parents. As the young persons reached adolescence at Time

2, they gave oral informed consent to participating in the assessment. At both times, data was collected by staff or students who had been trained in the applied instruments. Care was taken to ensure that the youths felt comfortable during assessment and, in case of distress, data collection was terminated.

A total of 42 youths participated at Time 1, and 46 youths participated at Time 2. The study sample consists of those youths who participated in the attachment interview at Time 1 and the clinical interview at Time 2 (N = 34). Of these, four did not fill out the questionnaire. The youths in the sample were between 10 and 12 year of age at Time 1 (mean ± SD: 10.45 ± .60 years) and between 12 and 15 years of age at Time 2 (mean ± SD: 13.35 ± .85 years). A total of 19 (55.9%) were male. The ethnicity of the youths was Hispanic (n = 14, 41.2%) African American (n = 13, 38.2%), and Asian (n = 7, 20.6%). The majority came from a single parent home (n = 22, 64.7%). Nine of the youths (26.5%) had no siblings living with them in the home, 17 (50%) had one or two siblings, and eight (23.5%) had between three and seven siblings living with them in the home. Income of the family was not available, but inclusion in the after-school program was primarily directed at children from low-income families who lived in public housing in a large urban community.

## Measures

*Time 1: Friends and Family Interview* (FFI; Kriss, Steele, & Steele, 2012; Steele & Steele, 2005; Steele et al., 2009). The FFI is a narrative interview protocol which provides knowledge within the attachment and peer relations domain. It draws from the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1985) in asking for evaluations of attachment relationships to parents and probing for specific memories to support the evaluations provided. All FFI constructs, scores, and category considerations (secure, dismissing, pre-occupied, and disorganized attachment) are rated on a 4-point scale, with a low score indicating lack of, or low levels of, the construct in question. Classifications are made in relation to secure, dismissing, pre-occupied, and disorganized attachment based on the highest 4-point rating assigned to these categories. For the FFI classifications, robust inter-rater reliability and construct validity has been demonstrated (Steele & Steele, 2005). The FFI has been validated in longitudinal work including SSP assessments in infancy (Steele & Steele, 2005), a script-based attachment task in middle childhood (Psouni & Apetroaia, 2013), and a range of independent studies of attachment in adopted children (reviewed recently by Pace, 2014). Most existing studies using the FFI have relied exclusively on reports of attachment category (e.g. Pace, 2014). It is more informative to apply multiple dimensions of attachment, as it is the focus of the current report.

For the current study, six FFI variables were selected to represent different attachment and peer-relation constructs. We included the four attachment constructs of coherence, developmental perspective, secure base/safe haven to mother, and secure base/safe haven to father, and the peer relation constructs of social competence and quality of contact with best friend. These constructs were carefully chosen to best represent each of the broad-band FFI categories: Coherence, Reflective Functioning, Evidence of Safe Haven/Secure Base, Evidence of Self Esteem, and Peer Relations. *Coherence* is judged in the attachment tradition (Main, Hesse, & Goldwyn, 2008) in

terms of Grice's maxims of effective conversation, i.e. truth, relation, economy, and manner. Coherence ratings are applied to the whole interview like the overall classification of security. An evaluation of the child's ability to take on a *developmental perspective* is based on questions asking the children to think into the past and future and consider themselves and their relationship with their caregivers overall. They are asked how things have changed in the last five years, and how they believe things might change in the following five years. *Secure base/safe haven* for mothers and fathers are derived from questions about the child's relationship with his/her parents, e.g. "What do you do when you are upset?" Finally, peer-relations are captured both in terms of the *social competence* of the child and the *quality of best friend contact*. Social competence is part of the broad-band category Self Esteem, and is based on the reported ease with which the child engages in social situations, as well as the importance put on these. The highest levels of quality of best friend contact are seen in children who report a reciprocal engagement with their best friend, where emotional states can be shared. The lowest quality is found in reports that describe a non-reciprocal, instrumental friendship. Collected interviews were recorded, transcribed, and rated according to a standardized coding manual (Steele et al., 2009). For the present study, interview transcripts were coded by three independent raters, who demonstrated excellent inter-rater reliability on all constructs including the ones selected for the present study. Single-measure Intra-Class Correlations (ICCs) were computed for each scale, mean = .88 (range = .72–.91).

For the current study, with respect to the four well-known classifications, the highest mean rating was found for evidence of dismissing attachment (mean ± *SD* = 3.21 ± .96). The means for the other patterns of attachment were of similar size (mean ± *SD* for secure = 1.97 ± .97; preoccupied = 1.62 ± .92; disorganized = 1.68 ± .94). The final attachment classification, which is based on the relative distribution of these scores (assigning the interview to the classification with the highest rating), revealed that 25 children (73.5%) were insecurely attached. The frequency distribution of classifications was: nine (26.5%) Secure; 17 (50%) Insecure-Dismissing; two (5.9%) Insecure-Preoccupied; and six (17.6%) Disorganized.

*Time 2: Revised Child Anxiety and Depression Scale* (RCADS; Chorpita, Yim, Moffitt, Umemoto, & Francis, 2000) consists of 47 items and has been shown to measure DSM-IV symptoms of anxiety disorders (generalized and separation anxiety disorder, social phobia, panic disorder, and obsessive-compulsive disorder) and depression in children. It is scored on a 4-point scale (0 = *never*, 1 = *sometimes*, 2 = *often* and 3 = *always*). It has satisfactory psychometric properties with good internal consistency and adequate reliability and validity (Chorpita et al., 2000). In the present study the Total Anxiety subscale consisting of all but 10 items on depression was collected from the youths. Cronbach's alpha for the RCADS Total Anxiety subscale was .94.

*Time 2: Anxiety Disorders Interview Schedule for DSM-IV, Child Version* (ADIS-IV-C; Silverman & Albano, 1996) measures psychopathology in children. The semi-structured interview inquires about information on the DSM-IV symptoms of anxiety and other disorders. Symptoms are rated on a clinical severity rating (CSR) scale ranging from 0 to 8 by the child. A score of ≥ 4 indicates a clinical level of difficulties for the disorder in question. All interviews were administered by staff or students who had received training in administering and scoring of the ADIS-IV-C according to standard procedures

(Silverman & Albano, 1996), which included differential diagnostic codings of videos of anxious children, observing trained clinicians, and being observed in vivo by trained clinicians, before conducting interviews on their own. To ensure reliability, supervision was provided throughout the project period following each interview. Furthermore, for difficult and/or ambiguous interviews, the videotapes were viewed together and a consensus-score reached. Studies of the reliability of the ADIS-IV-C have overall shown a good-to-excellent reliability (Silverman, Saavedra, & Pina, 2001).

## Results

The results will be described in two sections. First, descriptive data from the sample and measures will be analyzed. Second, correlation and regression analyses will be provided showing the links between attachment and peer relations at 10–11 years, and anxiety at 13–14 years of age. Missing subscale cases were replaced by the mean of the subscale for the individual in question. Such missing cases appeared randomly distributed and amounted to approximately 5% of all cases. No significant differences in relation to gender and ethnicity were found between youth who participated at the first time point but not the second, and youth who participated at both time points.

### *Descriptive statistics for the anxiety, attachment, and peer relation constructs*

Six youths (17.6%; two male) met the criteria for an anxiety disorder as the primary disorder. Three had generalized anxiety disorder (GAD), one had separation anxiety disorder (SAD), one had social phobia (SoP), and one had specific phobia (SP) as the primary disorder. Three youths met criteria for a secondary diagnosis (one GAD, one SoP, and one Dysthymia) of these two also met criteria for a tertiary diagnosis (one SAD, one SoP).

In order to observe how the selected six FFI scales were linked up to one another, intra-correlations among the six scales were computed relying on Pearson's $r$ (see Table 1).

Table 1 shows that while all six FFI scales correlated with one another, quality of best friend contact stands and social competence stand out for their high (expected) level of overlap ($r = .70$, $p < .01$) with safe haven mother and safe haven father also correlating highly and significantly with these peer constructs. Table 1 also shows that coherence and developmental perspective overlapped considerably ($r = .61$, $p < .01$). Furthermore, Table 1 shows that all six FFI scales were internally consistent (alpha = .84), a summary

Table 1. FFI intra-correlations (Pearson's $r$, tested two-tailed) between attachment and peer relation constructs measured at Time 1 ($N = 34$).

|  |  | 1. | 2. | 3. | 4. | 5. | 6. |
|---|---|---|---|---|---|---|---|
| 1. | Secure base/safe haven mother | – |  |  |  |  |  |
| 2. | Secure base/safe haven father | .39* | – |  |  |  |  |
| 3. | Overall coherence | .61** | .34[a] | – |  |  |  |
| 4. | Developmental perspective | .32[a] | .29 | .61** | – |  |  |
| 5. | Social competence | .44* | .37* | .53** | .36* | – |  |
| 6. | Quality of best friend contact | .50** | .35* | .56** | .31[a] | .70** | – |

Note: ** = $p < .01$; * = $p < .05$; [a] = $p < .10$; Internal consistency of six FFI scales: Alpha = .84

scale was not computed given the small sample size, and study interest in considering attachment influences as possibly distinct from peer influences.

## Attachment and peer relation constructs in relation to anxiety symptoms and diagnoses

To consider links between the FFI responses at age 10–11 years with anxiety symptoms three years later, we first correlated the four preliminary ratings for attachment classifications of the FFI with anxiety symptoms. Data revealed that the correlations were non-significant (Pearson $r$ for secure, dismissing, pre-occupied, and disorganized attachment were −.35, −.05, −.02, and .15, respectively). Similarly, there were non-significant associations between insecure versus secure classifications of the FFIs and whether or not the youth met criteria for an anxiety disorder three years later. This was the case, despite five of the six youths who met criteria had been insecure in response to the FFI, a non-significant number given that 25/34 (74%) of the FFIs provided were classified insecure. However, there was a trend towards significance for the negative correlation observed between secure attachment and anxiety symptoms ($r = −.35$, $p < .05$, one-tailed). Analyses of the correlations between the selected attachment and peer relation scores assigned to the FFIs and anxiety symptoms are displayed in Table 2.

Table 2 reveals that all of the six FFI dimensions, indexing different positive features of attachment and peer relations, correlated significantly and negatively with anxiety (RCADS) symptoms. Further, Table 2 includes gender, scored as males = 1 and females = 2, with being a female correlating positively, though not significantly, with anxiety symptoms. Given this latter observation, gender was included in the first step of each of the regression equations reported on below, aimed at identifying the unique contributions of the different FFI scores at age 10/11 years made to self-reported anxiety symptoms at age 13/14 years.

We conducted a series of linear regression analyses to assess the predictive power of the two attachment sets of scores (for coherence/developmental understanding and secure base/safe haven mother/father) and one set of scores for peer relations (social competence and quality of best friend contact) with anxiety symptoms (RCADS) as the outcome. Three summary regression tables are shown in Tables 3 and 4.

First, in Table 3, we assessed Secure base/safe haven to mother and Secure base/safe haven to father on anxiety symptoms measured by the RCADS. The summary model fit was significant and explained 33% of the variance in the adolescent's self-reported level of anxiety symptoms. The summary model included poorer Secure base/safe haven to

Table 2. Correlations between attachment and peer relation constructs, anxiety symptoms and diagnoses ($N = 30$).

| | Anxiety symptoms: RCADS |
| --- | --- |
| Gender (male vs. female) | .23 |
| Secure base/safe haven mother | −.43* |
| Secure base/safe haven father | −.44* |
| Coherence | −.41* |
| Developmental perspective | −.44* |
| Social competence | −.40* |
| Quality of best friend contact | −.42 |

**Table 3.** Two linear regression summary models of gender (1 = male; 2 = female) and attachment measures at 10 years as predictors of self-reported anxiety symptoms (RCADs) at 13 years.

| Variable | B coef | SE B | Beta | p |
|---|---|---|---|---|
| Summary of gender and safe haven/secure base predictors of anxiety (RCADS) | | | | |
| Constant | 29.61 | 5.93 | | <.001 |
| Gender | 8.50 | 4.63 | 0.33 | .078 |
| Secure base/safe haven to mother | −6.42 | 3.17 | −.44 | .053 |
| Secure base/safe haven to father | −3.30 | 4.60 | −.15 | .480 |
| Summary of gender and Coherence predictors of anxiety (RCADS) | | | | |
| Constant | 35.63 | 6.55 | | <.001 |
| Gender | 11.16 | 4.24 | .43 | .014 |
| Developmental perspective | −4.84 | 3.16 | −.29 | .138 |
| Coherence | −7.73 | 3.93 | −.39 | .060 |

**Table 4.** Linear regression analysis of gender (1 = male; 2 = female) and peer relationship measures at 10 years as predictors of self-reported anxiety symptoms (RCADS) at 13 years.

| Variable | B coef | SE B | Beta | p |
|---|---|---|---|---|
| Gender and peer relation predictors of anxiety (RCADS) | | | | |
| Constant | 36.73 | 7.10 | | <.001 |
| Gender | 12.12 | 4.31 | .47 | .009 |
| Social competence | −4.02 | 3.80 | −.22 | .30 |
| Quality of best friend contact | −7.03 | 3.35 | −.46 | .046 |

mother (beta = -.44, $p$ = .053) and female gender (beta = .33, $p$ = .078) as trending significantly in predicting an elevated level of anxiety symptoms. As there was marked and significant collinearity between Secure base/safe haven with mother and Secure base/safe haven with father, in their shared overlap with anxiety, the power of the effect of each is suppressed in the summary model.

Second, in Table 3, we assessed Developmental perspective and Coherence on anxiety symptoms measured by the RCADS. There was significant collinearity for the attachment scores of Coherence and Developmental perspective such that the magnitude of the influence of each on anxiety is suppressed in the summary model. Still, the summary model shown in Table 3 was significant and explained 39% of the variance in anxiety scores, with female gender making an independent and significant contribution (beta = .43, $p$ = .014) and Coherence being the stronger attachment predictor (beta = −.39, $p$ = .06).

Lastly, Quality of contact with best friend, and Social competence, were assessed in Table 4. The summary model explained 32% of the variance with gender playing a significant role (beta = .47, $p$ = .009) and Quality of best friend contact also playing a significant role (beta = −. 46, $p$ = .046) in predicting an elevated level of anxiety symptoms. As in Table 3, there is marked and significant collinearity between the two peer relation scores that each relates to anxiety symptoms, diminishing the weight of each in the summary model. When all six FFI scores, with gender, are in a regression model predicting anxiety symptoms, the explained variance of the significant model rises to 48%.

Spearman correlations and logistic regressions were then run to assess which of the attachment- and peer-relation constructs may explain the variance when criteria for an anxiety disorder were met; 34 youth were available for consideration, six of whom (18%) met criteria. The correlations revealed two FFI scores to be linked up with meeting

criteria for an anxiety disorder. These were Social competence (rho = −.36, $p < .05$, two-tailed) and Developmental perspective (rho = −.31, $p < .05$, one-tailed). Gender (being female) correlated positively but not significantly with the binary variable identifying those youth who met criteria for an anxiety disorder (rho = .21, $p = .12$, one-tailed). The most efficient logistic regression model observed relied on an omnibus test with model coefficients gender, social competence, and developmental perspective. This model had overall accuracy of 82% with 50% sensitivity (identifying those with an anxiety disorder) and 89% specificity (identifying those without an anxiety disorder), Chi-square = 5.241, $df = 1$, $p < .05$.

## Discussion

### *Attachment constructs and their prediction of anxiety*

Although insecure attachment has generally been associated with anxiety in childhood (Bögels & Brechman-Toussaint, 2006), a recent meta-analysis suggests that this association is small (Groh et al., 2012). Furthermore the meta-analysis points to the need for studies of clinically anxious samples, as most of the existing literature has examined the influence of attachment on the development of anxiety symptoms rather than on diagnoses. As mentioned, several studies have failed to find attachment in infancy or early childhood to be significant predictors of the presence of an anxiety diagnosis in middle childhood or adolescence (e.g. Bosquet & Egeland, 2006; Hudson & Dodd, 2012). We did not find significant correlations between attachment classifications and anxiety symptoms.

Our regression models including attachment constructs in a non-White sample were found to provide significant explanations for the variation of anxiety symptoms three years after the attachment interview was administered, but less efficiently for the presence of an anxiety diagnosis, better for the absence of an anxiety disorder. Overall, this is in line with previous findings. As we did not apply attachment categories in our models, but rather examined the relative influence of attachment dimensions, we must caution against drawing firm conclusions before our results have been replicated. We found Secure base/safe haven to mother, as well as Secure base/safe haven to father, to be correlated with anxiety symptoms three years after the attachment interview, as was observed for the dimensions of coherence and developmental understanding. Correlations among these dimensions suggested a high degree of overlap consistent with other studies of FFI responses from children in middle childhood (e.g. Kerns, Mathews, Koehn, Williams, & Siener-Ciesla, 2015). The regression results reflected a high degree of collinearity among the FFI scales, with quality of best friend contact reaching significance as an independent predictor above and beyond female gender. Given our small sample size, and considering the magnitude of the correlations and beta coefficients reported, we expect all of these findings to be significant had the sample been larger. This is not surprising as children have long been assumed to benefit from a secure attachment in terms of confidence to learn to explore their surroundings whilst knowing that support will be available should they need it, thereby reducing the level of anxiety in the child, and both Secure base/safe haven and Coherence constructs may be viewed as indicators of attachment security (Bowlby, 1973; Steele & Steele, 2005).

Our overall regression models lend support to the suggestion that attachment may be seen as an underlying risk or protective factor for the development of psychopathology, as suggested by original theoretical models (Bowlby, 1973) as well as in contemporary approaches (e.g. Esbjørn et al., 2012). Current results point to the value of children acquiring by 10/11 years of age an emerging developmental understanding, together with social competence, and these may jointly protect the child against developing an anxiety diagnosis in the ensuing years. This suggestion is supported by the Minnesota study, which reported that the best predictor of a life-time anxiety diagnosis in adolescence was previously reported anxiety symptoms, and lack of socio-emotional competence rather than attachment to parents measured in infancy or early childhood (Bosquet & Egeland, 2006).

Interestingly, given the at-risk status of the non-White youth in the current study, the typical or normative level of anxiety diagnoses observed among 13-year-olds, less than 20% is notable. This may be a reflection of the after-school program these youths were participating in, where academic achievement and social skills are central foci of the program (I Have a Dream Foundation). The achievements of the after school program are all the more remarkable given the high level attachment insecurity observed at the level of attachment classifications when the youths were interviewed at 10 years of age.

## Peer constructs and their prediction of anxiety

We found that Quality of contact with best friend in middle childhood significantly predicted anxiety symptoms in adolescence. This is in line with previous studies (e.g. Bosquet & Egeland, 2006; Brumariu & Kerns, 2010). The relative importance of peer relations may thus provide important information when screening to identify youths at risk for the development of anxiety disorders.

Direct comparisons between studies are, however, compromised by the differences in conceptualization of social competence and peer representations. The definition of social competence applied by the FFI includes an evaluation of the spontaneity, ease, and confidence with which the child engages in peer relations and social activities. In the definition by Brumariu and Kerns (2013), peer competence refers to the child's effectiveness in the peer group. This is in line with the definition of social competence by Bosquet and Egeland (2006). Their concept of peer relationship representations is highly related to autobiographical interviews of attachment such as the Adult Attachment Interview, and consists of expectations, perceptions, feelings, and attitudes regarding peer relationships and close friendships. The peer relationship representation construct is broader than the Social competence construct, as it also consists of aspects of the Quality of friendships. In our study, the definition of quality of best friend contact included emotional reciprocity in the relationship with best friend. The two constructs in our study were moderately associated suggesting that the constructs overlap.

## Study limitations and strengths

Our study is not without limitations. As the study is exploratory in nature, we must caution the reader against drawing firm conclusions before our results have been

replicated. Furthermore, information was only gathered from the youth. A multi-informant approach, including information from parents and teachers as done in previous research (Bosquet & Egeland, 2006), would likely have strengthened our findings. However, due to the high-risk nature of this sample, it was not possible to engage a sufficient number of parents for the information to be representative. Furthermore, our sample size is small, which precludes testing all the potential predictors in a single regression model. We must therefore caution against drawing firm conclusions before our results have been replicated in a larger and representative sample. Our sample differs from most other longitudinal studies of attachment, as only a minority of these have been conducted using a non-White sample (Schneider et al., 2001), e.g. the Minnesota and NICHD studies include 70% and 80% White families, respectively (Brumariu & Kerns, 2013; Kerns et al., 2011; Sroufe, 2005).

The application of similar samples limits our understanding of developmental pathways to White children. Our study, by contrast, provides data on a non-White sample, thus expanding previous knowledge. However, we cannot rule out the possibility that the young persons' stable participation in the after-school program may have provided them with a continuous and safe base affecting the findings. It is thus possible that our findings of the role of peers may not be replicated to the same degree in other high-risk samples that have not had this type of adult-guided opportunity for being together with same-aged peers. This, of course, warrants further caution in generalizing from the present results. Notwithstanding the limitations of the study, certain strengths of the current report can be underlined. It is a prospective longitudinal design, over two time points that are three years apart. Our study is also, to our knowledge, the first of its kind to apply a comprehensive autobiographical assessment tool (the FFI) to assess the role of attachment and peer constructs in middle childhood for the development of anxiety in adolescence.

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## Disclosure statement

No potential conflict of interest was reported by the authors.

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