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## Childhood Predictors of Anxiety Symptoms: A Longitudinal Study

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### Abstract

The present study examined the concurrent and prospective relation between a select number of potential predictors and symptoms of anxiety among a high-risk community sample of 149 predominately African American children. Parent and child reports of anxiety were assessed in the first and seventh grade. Six domains of childhood risk factors (i.e., Loss-Death, Loss-Separation, Social Adversity, Negative Family Environment, Academic Difficulties, and Peer Rejection) were assessed using multiple informants in the first grade. Results indicated that children who experienced a more negative family environment, had a greater number of losses and deaths, and experienced academic failures in the first grade exhibited higher levels of anxiety (concurrently and/or at the six year follow-up). Findings provide empirical support to etiological models that posit both parental/familial and environmental factors contribute to the development of heightened anxiety in children.

### Keywords

risk factors; child anxiety; African American

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Anxiety disorders are among the most common childhood psychiatric disorders, with prevalence rates ranging between 3% and 15%.<sup>1</sup> Children with anxiety disorders experience significant impairment in their academic, familial, and social functioning. For instance, many anxious children have difficulty attending and performing in school, struggle with making and maintaining friendships, have high levels of family conflict, and experience significant personal distress (e.g., see Refs. 2–4). In light of the high prevalence of anxiety disorders and the short- and long-term impairment they confer, attempts to identify early risk factors or predictors of anxiety are needed. Identifying predictors of psychopathology is critical for informing etiological models, facilitating early identification, and developing preventive interventions.<sup>5</sup> The focus of the present study was to address this issue by examining a broad range of theorized predictors of anxiety over a seven-year period, capitalizing on an existing community-based longitudinal data set from the Baltimore Prevention Research Center at Johns Hopkins University Bloomberg School of Public Health.

Developmental models of anxiety disorders in children served as a guide for identifying potential predictors. These models generally stress the reciprocal relation between a number of child (e.g., behavioral inhibition and avoidance, distorted thinking), parental/familial (e.g., psychopathology, family environment, parenting behaviors), and environmental

factors (e.g., poverty, traumatic experiences).<sup>6-9</sup> Utilizing primarily concurrent designs, studies attempting to empirically validate theorized risk factors have identified several familial and environmental correlates of anxiety (e.g., see Refs. 10 and 11). Although concurrent studies have been informative, longitudinal studies provide information concerning trajectories of development, suggest direction of causality, and hold greater promise for identifying risk and resilience factors.<sup>12,13</sup> Although several studies investigating child factors have utilized longitudinal designs,<sup>14-16</sup> there are few prospective studies examining familial or environmental factors.

Among the existing prospective studies, findings substantiate aspects of the three-pronged etiological model that emphasize child, parent/family and environmental factors. For instance, with respect to child variables, evidence from longitudinal studies support such biological markers as behavioral inhibition and child temperament as predictors of later anxiety. Specifically, children with early (e.g., 21 months, 31 months) and persistent behavioral inhibition (i.e., the tendency to exhibit fear and withdrawal in response to novel situations) have been found to have higher rates of anxiety disorders in childhood and adolescence than children who are not consistently classified as inhibited.<sup>14-16</sup> Other traits related to child temperament have also been linked to later anxiety. For instance, Shaw and colleagues<sup>17</sup> reported that difficult temperament measured during infancy (6–11 months) was a significant predictor of internalizing scores at age 5 on the Child Behavior Checklist (CBCL).<sup>18</sup>

Studies examining familial factors using prospective methodologies have investigated parent–child attachment,<sup>13,17</sup> specific parenting behaviors,<sup>19</sup> and family environment.<sup>20,21</sup> Most relevant to the current study are those that examined potential risk factors in the familial environment such as marital conflict or parental psychopathology. Rueter et al.<sup>20</sup> documented the relationship between parent-adolescent conflict and increases in internalizing symptomatology and new onset of a depressive or anxiety disorder over a four-year period. Over time, families that reported increasing conflict were significantly more likely than families that reported low conflict to have a teen that endorsed increasing internalizing symptoms (internalizing symptoms were presented as a global outcome measure of both anxiety and depression).

In addition to family conflict, parental psychopathology has been linked to child anxiety. In an extensive longitudinal study, Spence and colleagues followed from birth a subsample of over 4000 children that were participants in a larger longitudinal study in Australia.<sup>21</sup> Levels of maternal symptoms of anxiety and depression were assessed at 6 months and 5 years. Internalizing symptoms of the child were measured at 5 years of age by parent-report on the CBCL and at 14 years of age by both parent CBCL and Youth Self-Report (YSR).<sup>22</sup> Results indicated having a mother with high levels of anxiety and/or depression as a young child increased the risk of anxious-depressed symptoms in adolescence.

Similar to the literature examining family factors and anxiety, only a few longitudinal studies have examined environmental factors or specific life events as predictors of anxiety. Theoretically, childhood experiences with uncontrollable life events (e.g., death, separation from parent) are thought to increase a child's future expectations of uncontrollability, thus increasing the risk of onset and intensification of anxiety.<sup>23</sup> In the Spence et al.<sup>21</sup> article described above, researchers found that poverty and change in marital status (e.g., separation, divorce) significantly predicted elevations in anxious-depressed symptoms in adolescence; however, poverty was associated with internalizing symptoms only in girls. In another study, conducted with a community sample in the Netherlands, Kroes and colleagues followed five to six year old children for over one year and found that living in a single headed household, having a sibling, and experiencing a negative life event (type of

specific life event was not evaluated) each emerged as separate significant predictors for anxiety disorders.<sup>24</sup> Finally, Shaw et al. investigated the relation between negative life events assessed during infancy (15 months) and CBCL internalizing scores at five years of age among 86 low-income mother–child dyads (40% were African American).<sup>17</sup> The total number of negative events (the impact of individual events was not examined) proved to be a significant predictor of CBCL scores.

Taken together, the existing longitudinal studies generally support a complex model of etiology encompassing child, parent, and environmental factors in the development of child anxiety; however, additional questions remain and several limitations are present. For instance, many studies assessed internalizing symptoms (combining anxiety and depression) rather than specific anxiety symptoms. Therefore, we do not know whether elevations in symptoms found were due to elevations in depressive or anxious symptoms. In addition, the majority of studies have used Caucasian, middle-class samples, raising questions about the extent that previous findings generalize to minority and low-income populations. Research that has included diverse samples suggests that both minority status and poverty are significantly associated with internalizing symptoms.<sup>17,21,25</sup> Finally, few studies have examined the relative importance of various domains of predictors (e.g., is family environment more predictive of anxiety than poverty).

To address some of the gaps in the literature, the present study examined the concurrent and long-term association between a broad range of potential risk factors and symptoms of anxiety in a predominately African American community-based sample of high-risk youth. Initial measurement of risk factors and symptoms occurred in first grade, whereas follow-up assessments of anxiety symptoms were completed during seventh grade. This study capitalized on an existing database from the Baltimore Prevention Program (Baltimore Prevention Research Center, Johns Hopkins University Bloomberg School of Public Health), therefore assessment time periods and predictor variables were preselected. However, early adolescence represents a developmental period of increased risk for the onset of social anxiety concerns; therefore, an assessment of internalizing symptoms in seventh grade was expected to potentially capture emerging difficulties in these areas of functioning.<sup>26</sup> Thirty-one variables theorized to be associated with anxiety were categorized into six domains (i.e., Loss-Death, Loss-Separation, Social Adversity, Negative Family Environment, Academic Difficulties, and Peer Rejection) and examined in relation to symptoms of anxiety. It was hypothesized that a greater number of risk factors in each domain would be positively associated with concurrent and prospective levels of anxiety. As the accumulation of risk factors has been shown to be additive, such that an increase in the number of stressful life events or other risk factors is associated with an increase in risk for psychopathology,<sup>27,28</sup> we also examined the relation between the total number of risk factors and anxiety. In addition, we assessed whether specific domains of risk factors were more predictive of later anxiety symptoms at both time points. Finally, as females tend to report more internalizing symptoms in response to adverse life events than males,<sup>21,29</sup> we conducted exploratory analyses to examine the relation between each domain and anxiety symptoms by gender.

## Method

### Participants

Participants included 149 first grade children (72 females), ranging in age from 5 to 8 ( $M=5.97$ ,  $SD=.47$ ) and a parent or guardian (77% biological mother, 10% biological father, 10% female guardian, 3% male guardian). The racial makeup of the sample was 87.9% African American and 12.1% Caucasian. The 149 participants constituted a subsample of a larger study of 678 children and families, representative of the entering first graders in nine

Baltimore City public elementary schools. From the original sample, 175 children were identified using a stratified random sampling procedure based on symptoms of depression to participate in an intensive study that included additional assessments of psychological functioning. Of those identified, 149 agreed to participate in the more intensive study. Of the participating 149, all children endorsed three or more symptoms (out of 20) of depression in the last two weeks based on the Baltimore How I Feel-Young Child Version, Child Report (BHIF-YC-C).<sup>30</sup>

At the seventh grade follow-up, several families were lost to attrition. Specifically, in the seventh grade 126 parents and 130 children completed measures of child anxiety. Participants missing data at Time 2 did not differ on gender or child reports of anxiety. However, parents missing data at Time 2 were significantly more likely to rate their children as higher on anxiety in the first grade; [ $t(127) = -2.54, p < .05$ ].

## Predictor Variables

**Overview**—A total of 31 predictors were grouped into six domains (i.e., Loss-Death, Loss-Separation, Social Adversity, Negative Family Environment, Academic Difficulties, and Peer Rejection). Predictors were assessed in the first grade using several measures and multiple informants (i.e., parent, teacher, child, and peer). Below we review the instruments and then detail the item content of each domain.

**The Life Events Schedule (LES).**<sup>31</sup>—The LES, completed by parents, is one of the most widely used life events measures and assesses the occurrence of 30 stressful life events over the last six months. Reliability estimates are satisfactory with test-retest coefficients ranging from .87 to .89.<sup>31</sup> Validity for this scale has been demonstrated in several studies that support a link between life events and children's physical and mental health (see Johnson, 1986 for a review). For the present study, each adverse event was scored "1" for presence and "0" for absence for inclusion in the predictor domains.

**Parent Interview**—During a semi-structured interview, the parent or guardian was asked to respond to several questions regarding family sociodemographic characteristics (i.e., marital status, employment status) and family environment (e.g., Has mental illness/legal difficulties/etc., affected your family in the last year?). Training of lay interviewers included practice assessments observed by the supervisory staff and weekly supervision sessions that featured review of appropriate assessment administration procedures and discussions of problems encountered administering the measures. Interviewers were predominately African American young adults and about 70% were females. For the present study, predictor variables (e.g., divorce, unemployment, mental illness, and legal troubles) were scored a "1" if present. All other responses (e.g., married, employed, family not affected by mental illness or legal troubles) were scored "0."

**Composite International Diagnostic Interview (CIDI).**<sup>32</sup>—The CIDI is a structured adult psychiatric interview that specifies the exact wording and sequence of questions and provides a complete set of categories for classifying respondents' replies.<sup>33</sup> The CIDI assesses criteria for 14 DSM-III-R diagnoses including mood disorders, anxiety disorders, and addictive disorders. In the present study, two PhD-level clinical psychologists administered a computerized version of the CIDI to the parent. The psychometric properties of the CIDI are acceptable.<sup>34</sup> In the following analyses, the presence of psychopathology in the maternal figure was scored "1," whereas the absence of psychopathology was scored "0."

**Teacher Observation of Classroom Adaptation-Revised (TOCA-R).**<sup>35</sup>—The TOCA is a structured interview conducted with teachers that assesses a child’s performance on six basic tasks (e.g., accepting authority, social participation, self-regulation). In addition, the teacher reports on academic performance (“Overall, would you say the child’s grades in your class are excellent, good, fair, barely passing, likely failing, or definitely failing?”). Training of lay interviewers included practice assessments and ongoing weekly supervision sessions. Test–retest correlations over a 4-month period are .60 and greater and the coefficient alphas of the subscales range from .85 to .96.<sup>35</sup> Only the academic performance rating was utilized in this study. Responses of “likely failing,” and “definitely failing,” were scored “1,” all other responses were scored, “0.”

**Peer Nomination Inventory (PNI)**—PNI is a peer report measure of sociometric status adapted from the Pupil Evaluation Inventory (PEI).<sup>36</sup> Items were selected from the original PEI relating to peer likeability/rejection (e.g., “Which children don’t you like?”). Test–retest data for the peer rejection index used in the present study was satisfactory (ICC=.52).<sup>37</sup> Children were provided with photographs of classmates and were instructed to fill in the bubble under the picture of a classmate if that classmate fit the description included in the question/nomination item (e.g., “Which children are your best friends?”). Raw scores were converted to standard scores based on the distribution of nominations within a child’s classroom. Scores represent the average percentage of classmates that nominated the child across three descriptors within each of the assessed constructs. Peer rejection ratings that fell within the highest third were scored “1,” and the remaining ratings were scored “0.”

**Comprehensive Test of Basic Skills-4 (CTBS).**<sup>38</sup>—The CTBS is one of the most frequently used standardized achievement batteries in the US. Subtests assess both verbal (word analysis, visual recognition, vocabulary, comprehension, spelling, and language mechanics and expression) and quantitative topics (computation, concepts, applications). The CTBS was standardized on a nationally representative sample of 323,000 children from kindergarten through grade 12. In the present study, children were administered the CTBS 4 Version 10 Form A in the Fall of the first grade. Scores that fell within the lowest third of the sample were scored “1,” whereas scores that fell within the upper two-thirds were scored “0.”

### Predictor Domain Scores

Predictors were grouped into the following six domains: Loss-Death, Loss-Separation, Social Adversity, Negative Family Environment, Academic Difficulties, and Peer Rejection. In order to determine the reliability of the domain grouping, three psychologists were provided with a list of 32 possible predictors and asked to independently sort the items into the six domains. Classification of 29 of the life events achieved 100% agreement across raters. Two items achieved agreement by two out of three raters (i.e., “Parent had a jail sentence of over one year,” and, “parent away more due to job change”). One item, “Parent had minor jail sentence,” was excluded due to disagreement across the three raters.

**Loss-Death Domain (five items)**—The Loss-Death domain included the following items from the LES: death of a grandparent, death of a sibling, death of a close adult friend, and death of a child’s pet. One item from the parent interview, death of a parent, was also included in this domain.

**Loss-Separation Domain (seven items)**—Six items comprising the Loss-Separation domain were obtained from the LES and included: change in parent job that requires the parent to be away more, grandparent hospitalized, sibling hospitalized, sibling moved away from home, parent had a jail sentence of over one year, and parent moved away from home.

One item from the parent interview, parents separated or divorced, was also included in this domain.

**Social Adversity Domain (six items)**—Predictors related to the experience of poverty or severe financial difficulties were grouped within the Social Adversity domain and included: parent lost job, family evicted from home, and family had funds cut off from agency (all from the LES). In addition, this domain included parental unemployment, financial problems, and free or reduced fee lunch program status (all taken from the parent interview).

**Negative Family Environment Domain (nine items)**—This domain included predictors from the parent interview that are theorized to negatively affect the family environment: marital difficulties, serious illness, legal troubles, alcohol and/or drug problems, and mental illness. Also included in this domain was the presence of a parental diagnosis of psychopathology determined by the CIDI and two items from the LES assessing an increase in arguments between parents and sibling involvement in drugs and alcohol.

**Academic Difficulties Domain (three items)**—The Academic Difficulties domain was comprised of two items based on the CTBS and one item from the TOCA. Using the CTBS results, a child was considered to have poor academic functioning if he or she scored within the bottom third of the sample population on the broad scores of Reading or Quantitative. Teacher reported failure or near failure status from the TOCA was also included in this domain.

**Peer Rejection Domain (one item)**—The Peer Rejection domain was assessed with one item based on peer nominations conducted in first grade. Those children within the highest third of peer rejection ratings were considered to have significant peer relations difficulties.

## Measures of Anxiety

**Baltimore How I Feel-Anxiety Scale-Young Child Version, Child Report (BHIF-YC-C).**<sup>30</sup>—The BHIF-YC-C is an early elementary school, child self-report scale of internalizing symptoms (10 anxiety items). Children reported the frequency of anxious symptoms over the last two weeks on a three-point scale (0=Never, 1=Sometimes, 2=Almost Always). The BHIF questionnaires (Young Child Version, Child Report; Young Child Version, Parent Report; and Adolescent Version, Youth Report) were designed for use as first stage measures in two-stage epidemiologic investigations. In the creation of the BHIF measures, a pool of items was drawn from existing child self-report measures of anxiety (e.g., the Revised-Children's Manifest Anxiety Scale).<sup>39</sup> Internal consistency in the first grade for the BHIF-YC-C Anxiety subscale was .64. In terms of concurrent validity, for each standard deviation increase in BHIF-YC-C Anxiety subscale scores in first grade, there was a 3-fold (and statistically significant) increase in the likelihood of the child's parent reporting that the child was in need of mental health services for "... feeling sad, worried or upset."<sup>30</sup>

**Baltimore How I Feel-Anxiety Scale Young Child Version, Parent Report (BHIF-YC-P).**<sup>30</sup>—The BHIF-YC-P is the parent version of the child self-report form of the BHIF-YC-C described above. The items are the same as those included in the BHIF-YC-P; however, the person is changed from you to s/he. In the first grade, the internal consistency for the BHIF-YC-P was .72 for the Anxiety subscale. With respect to predictive validity, for each standard deviation increase on the BHIF-YC-P Anxiety subscale in the first grade, a 20-fold increase was found in predicting a child diagnosis of Generalized Anxiety Disorder

(GAD) in ninth grade based on the computerized Diagnostic Interview Schedule Interview for Children IV (DISC-IV).<sup>30,40</sup>

**Baltimore How I Feel-Anxiety Scale Adolescent Version, Youth Report (BHIF-AY).**<sup>30</sup>—The BHIF-AY is youth self-report scale of internalizing symptoms (26 anxiety items). Adolescents reported the frequency of anxious symptoms over the last two weeks on a four-point scale from “never” (0) to “most times” (3). Among middle school students, reliability of the BHIF-AY Anxiety subscale is acceptable with the internal consistency at .88 and the two-week test–retest reliability coefficient at .76.<sup>30</sup> In terms of concurrent validity, youth self-reports on the BHIF-AY Anxiety subscale scores were significantly associated with a diagnosis of GAD on the computerized DISC-IV.<sup>30,40</sup>

**Diagnostic Interview Schedule for Children-IV (DISC-IV).**<sup>40</sup>—The DISC-IV is a widely used structured interview that generates DSM-IV diagnoses as well as symptom counts for diagnostic categories. Initial investigations reveal acceptable reliability.<sup>40</sup> At the seventh grade assessment, parents indicated the presence or absence of symptoms of Generalized Anxiety Disorder (e.g., excessive worry, difficulty stop worrying, reassurance seeking) using the relevant portions of the DISC-IV. An overall symptom count was used for our analyses (range 0–6 for GAD).

## Procedure

Time 1 assessment occurred during the first grade. At this time, the LES, parent interview, CIDI, TOCA, PNI, CTBS, and both parent- and child self-report versions of the BHIF-A were administered either in the classroom (for child measures) or at the Baltimore Prevention Center. The Time 2 assessment occurred in seventh grade and included the youth self-report version of the BHIF-A and the GAD portion of the DISC-IV. Child and parent measures were completed either in the classroom or at the Baltimore Prevention Center.

## Results

### Descriptive

**Predictors**—The prevalence of predictive factors for the total sample is shown in Table 1. Children experienced an average of six predictors (range of 1–13). The most common reported predictors (experienced by more than 30% of the sample) included financial difficulties, parent working away from the home, hospitalization of a grandparent, and parental psychopathology. Infrequently reported events (less than 3%) included death of a sibling, hospitalization of a sibling, sibling involved in drugs and alcohol, drug problems affected the family, and family had funds cut off from agency.

**Predictor Domains**—Pearson product moment correlations were computed to determine the association among predictor domains. Negative Family Environment was significantly positively associated with both the Loss-Separation and Social Adversity domains ( $r = .31, p < .001$ ;  $r = .20, p < .01$ ).<sup>i</sup> No other significant relations among domains were obtained.

**Anxiety**—Means and standard deviations for the anxiety measures at each time period are presented in Table 2. Mean anxiety scores differed significantly by gender for child report at Time 2, with females obtaining higher anxiety scores [ $t(128) = -3.37, p < .01$ ]. Pearson product-moment correlations among the anxiety assessments yielded mixed results. Parent-reported anxiety at Time 1 was significantly correlated with parent-reported anxiety at Time

<sup>i</sup>As a correction for multiple correlational analyses, only those correlations significant at  $p = .01$  are reported. In the exploratory analyses on gender differences, correlations significant at  $p < .05$  are reported.

2 ( $r = .26, p < .01$ ). In addition, the self- and parent-report measures of anxiety at Time 2 were significantly correlated ( $r = .26, p = .001$ ). No other significant correlations among the anxiety measures were obtained.

### Correlations between Predictor Domains and Child Anxiety

Pearson product-moment correlations between the six predictor domains and symptoms of anxiety for the total sample at both time points appear in Table 3. Findings indicated that the Loss-Death domain was associated with higher levels of parent-report anxiety (Time 1); Negative Family Environment was positively associated with child- and parent-report anxiety (Times 2 and 1, respectively); Academic Difficulties were significantly and positively correlated with child- and parent-report anxiety (only at Time 2); and the total number of predictors were significantly and positively correlated with child-report anxiety (Time 2) and parent-report anxiety (Time 1).

Exploratory Pearson product-moment correlations were conducted separately for the sample of boys and girls.<sup>ii</sup> Among boys, the only significant correlation obtained was between Negative Family Environment and parent-reported anxiety at Time 1 ( $r = .29, p < .05$ ). For girls, the Loss-Death domain was positively correlated with parent-reported anxiety at Time 1 ( $r = .43, p < .01$ ); Peer Rejection was positively correlated with parent-reported anxiety at Time 1 ( $r = .31, p < .05$ ); and the Academic Difficulties domain was positively correlated with child-reported anxiety at Time 2 ( $r = .40, p < .01$ ). Also for girls, the total number of predictors was positively associated with child reported anxiety at Time 2 ( $r = .34, p < .01$ ) and parent-reported anxiety at Time 1 ( $r = .26, p < .05$ ).

### Regression Analyses: Predictor Domains and Anxiety

Regression analyses were conducted in order to investigate whether the relation between predictor domains and later functioning remained significant after accounting for initial levels of anxiety symptoms (see Table 4). Regressions were conducted only for those domains with significant correlations with Time 2 symptoms (i.e., Academic Difficulties, Negative Family Environment, and total number of predictors). In each regression, Time 1 parent- or child-report of anxiety was entered first followed by the predictor domain. In order to control for common informant variance, child-report at Time 1 was entered as a covariate for analyses predicting child-report at Time 2, whereas parent-report at Time 1 was entered as a covariate for analyses predicting parent-report at Time 2. Results of the regression analyses revealed that Negative Family Environment and the total number of predictors accounted for a significant amount of variance in predicting child-report anxiety at Time 2. Academic Difficulties accounted for a significant amount of variance in predicting parent-report anxiety at Time 2. However, Academic Difficulties did not account for a significant amount of variance in predicting child-report anxiety at Time 2.

### Comparison of Predictor Domains in Prediction of Later Symptoms of Anxiety

To determine the most salient domain in the prediction of concurrent and later symptoms of anxiety, all domains were entered simultaneously into four separate regressions, predicting child-reported anxiety (Times 1 and 2) and parent-reported anxiety (Times 1 and 2). The results indicated that both the Loss-Death ( $\beta = .20, p < .05$ ) and Negative Family Environment ( $\beta = .22, p < .05$ ) domains were significant predictors of parent-reported anxiety in first grade. None of the domains significantly predicted child-reported anxiety in the first grade. Regarding the prediction of later child-reported anxiety, the Academic

<sup>ii</sup>Sample sizes at Time 1 for boys  $n = 76$  for self-report,  $n = 65$  for parent-report; and for girls  $n = 71$  for self-report,  $n = 64$  for parent-report. At Time 2 for boys  $n = 63$  for self-report,  $n = 61$  for parent-report; and for girls  $n = 67$  for self-report,  $n = 65$  for parent-report.



Difficulties domain emerged as the only significant predictor ( $\beta = .18, p < .01$ ). In the prediction of later parent-reported anxiety, Academic Difficulties ( $\beta = .21, p < .05$ ) emerged as a significant predictor. Surprisingly, the Loss-Separation ( $\beta = -.19, p = .05$ ) domain emerged as a significant predictor in the opposite direction than expected.

## Discussion

The present study examined the relation between a broad range of potential risk factors and symptoms of anxiety in a high-risk community sample of predominately African American youth. Overall, findings lend partial support to etiological models that posit parental/familial and environmental factors in the development of child anxiety. As expected, predictor domains representing significant loss, negative family environment, and academic difficulty were associated with heightened anxiety either concurrently or prospectively. Predictor domains that represented separation from loved ones, peer rejection, and poverty were not associated with increased anxiety. As hypothesized, children who experienced a greater total number of risk factors in early childhood reported higher levels of anxiety seven years later. Results of exploratory gender analyses suggest that the negative impact of the measured risk factors may be more pervasive for females than males. Specific results and their implications are discussed below.

Among the six predictor domains included in this study, three were consistently related to anxious symptoms, namely Loss-Death (e.g., death of a parent, death of a grandparent), Negative Family Environment (e.g., parental psychopathology, parental arguments, drug or alcohol problems in the family), and Academic Difficulties (e.g., poor academic performance). Moreover, the total number of predictor factors experienced was also positively associated with anxiety. These results replicate previous findings that have found family discord and parental psychopathology as potential risk factors for child anxiety.<sup>20,21</sup> Poor academic performance has also been linked to anxiety in childhood.<sup>2,41</sup> Findings are also consistent with previous research on child depression that suggests that the more risk factors a child experiences early in life, the more likely the child will exhibit elevated symptoms.<sup>27</sup> Theoretically, significant uncontrollable events, such as death of a parent or living in a chaotic family environment, may increase the risk of later internalizing symptoms through both biological and cognitive mechanisms. Biologically, early stressful life events may cause a deregulation of the central nervous system leading to overreactivity of corticotropin-releasing factor (CRF) systems that result in increased arousal and vulnerability to stressors, such as academic failure.<sup>42</sup> Cognitively, uncontrollable events may increase perceptions of helplessness and expectations of negative events and thereby increase a child's vulnerability to heightened anxiety.<sup>23</sup>

The impact of childhood risk factors varied over time. For instance, death of a loved one was associated only with concurrent levels of anxiety whereas academic struggles were related to only later levels of anxiety. In contrast, negative family environment was significantly related to anxiety in both the first and seventh grades. Risk factors such as loss of a loved one may represent severe, but time limited, events that although immediately associated with an increase in symptoms, may allow a child to recover with time. In contrast, the quality of the family environment reflects a potentially chronic stressor that may continue to increase risk over time. Academic difficulties were unrelated to anxiety in the first grade; however, youth who had greater academic struggles in first grade were more likely to report higher anxiety six years later. The relation between academic difficulties and anxiety at seventh grade may be related to the transition to middle school. Research demonstrates that the transition to middle school is a difficult change for adolescents to navigate and that girls especially tend to report general psychological distress across this transition.<sup>43,44</sup>

In comparing the relative importance of the first grade predictor domains in predicting seventh grade anxiety, academic difficulties emerged as a predictor and separation experiences emerged as a potential buffer. The significant relation between the Loss-Separation domain and seventh grade anxiety when all predictor domains were entered into one regression was unexpected and is in contrast to existing research that links divorce to internalizing symptoms in childhood.<sup>28</sup> The obtained relation suggests that those children who experienced a separation in first grade had significantly lower anxiety symptoms in seventh grade. Although this may be a spurious finding as the Loss-Separation domain was unrelated to later anxiety in the correlational analyses, it is possible that separation may represent a buffer for later anxiety. In his seminal theoretical article on risk factors, Rutter stated that early success experiences with separations may be protective in that a child may form attributions about the event that aid in the negotiation of future similar circumstances.<sup>45</sup> Also, as our assessment of life events occurred only in first grade, we may have missed potential buffers to the effects of early separation (e.g., other social support, quality of relationship with parents, remarriage for those who experienced a divorce).

One domain, Social Adversity (e.g., financial problems, parent lost job) was unrelated to child anxiety symptoms, a finding in contrast to previous studies (e.g., ref. 21). The nonsignificant finding may be explained by the unusually high rate of low-income families in this sample. In the current sample, nearly 71% of children qualified for the federally subsidized school lunch program whereas 27% reported that a parent recently lost a job. It is possible that the current sample was not sufficiently heterogeneous to detect any effects of financial strain.

Exploratory analyses by gender yielded several differences in the relation of predictor domains to anxiety symptomatology. Specifically, early experiences with loss and death, peer rejection, academic difficulties, and the total number of predictors, were associated with higher levels of anxiety for girls but not boys. Our findings may represent a more pervasive vulnerability to risk factors in females. Although reasons for these gender differences are speculative, one explanation may be that girls appraise and cope with such events differently than do boys. Several researchers theorize that feelings of uncontrollability over life experiences are more common in girls and thus foster higher rates of anxiety in response to life events.<sup>29,46</sup> Alternatively, it is possible that the negative impact of life events is similar in magnitude for both males and females but is differently manifested. Specifically, although females may manifest higher rates of internalizing symptoms, as found in the present study, males may evidence higher rates of externalizing symptoms. As the current analyses were exploratory in nature, additional research is needed to further examine the potential moderating effects of gender on the relation between risk factors and anxiety.

Despite the contributions of the present study, there are several limitations that are important to recognize. First and foremost, although recruited from the community, children in the current study endorsed 3 out of 20 symptoms of depression in the first grade. Thus, it is possible that the current sample is at heightened risk for psychopathology, and for anxiety specifically, due to the high rates of comorbidity between anxiety and depression.<sup>47</sup> Moreover, although longitudinal research suggests causality of risk factors more so than correlational research, findings from this study do not establish that a risk factor in fact caused anxious symptoms.<sup>5</sup> Therefore, the direction of the link between the predictor domains and anxiety symptoms remains unclear. Future studies need to address the mechanisms by which risk factors operate on anxious symptoms. In addition, the included domains were assumed to be negative, whereas the actual appraisal (positive and negative, uncontrollable and controllable) of the individual items in each domain by the participants is unknown. For instance, it is possible that an event such as “parent away more,” could be a

protective factor in some cases rather than a risk factor. Furthermore, the obtained correlations, although significant, explained relatively little of the variance in internalizing symptoms. Thus, it is likely that other factors are associated with the onset and maintenance of anxiety symptoms (see Ref. 48 for an example of different developmental pathways for depression). Related, the correlation between first and seventh grade anxiety symptoms was low and/or nonsignificant. Although anxiety symptoms are believed to wax and wane, previous research has found that there is some stability in anxiety symptoms over time.<sup>2</sup> The reason for the absence of a relation in this study is unclear, however it is possible that this finding reflects measurement error (i.e., different symptoms were assessed in first and second grades) or problems with first graders as reporters of their own internalizing symptoms. Finally, the present study examined an often-neglected population (predominately low income inner-city African Americans) who were sampled from a community-based population and whether findings are generalizable to other ethnic/racial populations awaits future investigation.

The present study has several implications for future research on the etiology, prevention, and treatment of childhood anxiety. For instance, the present results indicated that certain events (e.g., parental psychopathology, marital discord, academic difficulties) were more likely to be associated with anxiety symptoms than others. This knowledge may help mental health providers and prevention researchers target those children most at risk. Similarly, results reinforced previous findings that suggest that girls may be at higher risk of developing anxiety symptoms in the wake of adverse experiences than are boys, thus implying that early intervention may be more critical for girls. Although this study added to the literature in many ways, the examination of predictors and their role in the etiology of anxiety remains in the beginning stages. Future research needs to address possible mediating and moderating variables (e.g., locus of control, individual's perception of the severity of the event, social support) in the relationship between anxiety and potential risk factors.

## Summary

The current study investigated the relation between several types of predictors assessed in first grade and symptoms of anxiety, both concurrently and six years later, among high-risk African-American children. In the first grade, the presence of several risk factors were assessed and grouped into six domains (i.e., Loss-Death, Loss-Separation, Social Adversity, Negative Family Environment, Academic Difficulties, and Peer Rejection). Parent and child reports of anxious symptoms were assessed in first and seventh grade. Results indicated that children who experienced a more negative family environment, had a greater number of losses and deaths, and experienced academic failures in the first grade exhibited higher levels of anxiety (concurrently and/or at the six year follow up). Findings provide empirical support to etiological models that posit both parental/familial and environmental factors are associated with anxiety symptoms in children.

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**Table 1**

## Prevalence of Risk Factors Grouped by Domain

<b>Risk Factor</b>	<b>Total(%)</b>
<i>Loss-death</i>	
Death of a parent	10.7
Grandparent died †	14.8
Sibling died †	1.3
Close adult friend died †	12.1
Child pet died †	21.5
<i>Loss-separation</i>	
Parents separated or divorced †	17.4
Change in parent job away more †	32.9
Grandparent hospitalized †	36.2
Sibling ill hospitalized †	2.0
Sibling moved away from home †	8.7
Parent jail sentence > 1 year †	6.7
Parent moved far away from home †	12.8
<i>Social adversity</i>	
Free/reduced lunch status	70.7
Parental unemployment	15.4
Financial problems affected the family	50.7
Parent lost job †	26.8
Family evicted from home †	5.4
Family had funds cut off from agency †	4.0
<i>Negative family environment</i>	
Marital difficulties affected the family	23.0
Serious illness affected the family	15.5
Trouble with the law affected the family	1.4
Alcohol problems affected the family	6.1
Drug problems affected the family	2.7
Mental/emotional illness affected the family	9.5
Parental psychopathology	37.6
Increase in parental arguments †	18.8
Sibling involved in drugs and alcohol †	1.3
<i>Academic difficulties</i>	
Low reading achievement scores	29.7
Low math achievement scores	28.9
Near failure/Failure status	28.9
<i>Peer rejection</i>	

<b>Risk Factor</b>	<b>Total(%)</b>
Peer rejection	25.0

<sup>†</sup>Items from the Life Events Scale.<sup>31</sup>



**Table 2**

## Means and Standard Deviations for Measures of Anxiety

	Total Sample	Females	Males
<i>Time 1</i>			
BHIF-YC-C	1.05 (.37)	1.12	.99
BHIF-YC-P	1.21 (.26)	1.20	1.23
<i>Time 2</i>			
BHIF-AY	.58 (.52)	.84	.59*
DISC-IV GAD	2.67 (2.36)	2.86	2.46

\*  $p < .01$

**Table 3**

Correlations Between Predictors and Measures of Anxiety at Time 1 and Time 2

	Child Report Anxiety		Parent Report Anxiety	
	T1	T2	T1	T2
Loss-death	.03	.15	.23**	.06
Loss-separation	.07	.15	.14	-.05
Social adversity	-.05	.15	.03	.08
Negative family environment	.05	.19*	.26**	.08
Academic difficulties	.06	.21**	-.08	.19*
Peer rejection	.05	.09	.09	.09
Total number	.06	.29**	.20*	.13

\*  $p = .01$ ,\*\*  $p < .01$

**Table 4**

Predictor Domains at Time 1 as Predictors of Anxiety Symptoms at Time 2 Controlling for Initial Levels of Symptoms

	$\beta$	$R^2$	$\Delta R^2$
<i>Predicting Child-Report Anxiety at T2 (BHIF-AY)</i>			
Child-report anxiety at T1 (BHIF-CY-C)	.16	.03	
Negative family environment	.18	.06	.03*
<i>Predicting Child-Report Anxiety at T2 (BHIF-AY)</i>			
Child-report anxiety at T1 (BHIF-CY-C)	.16	.03	
Academic difficulties	.22	.05	.02
<i>Predicting Child-Report Anxiety at T2 (BHIF-AY)</i>			
Child-report anxiety at T1 (BHIF-CY-C)	.16	.03	
Total number of predictors	.23	.07	.05*
<i>Predicting Parent-Report Anxiety at T2 (DISC-IV GAD)</i>			
Parent-report anxiety at T1 (BHIF-CY-P)	.26	.07	
Academic difficulties	.20	.11	.04*

\*  $p < .05$