Childhood Anxiety Disorders: Etiology, Assessment, and Treatment in the New Millennium

Tracy L. Morris, PhD

Address
Department of Psychology, West Virginia University,
114 Oglebay Hall, Morgantown, WV 26506-6040, USA.
E-mail: tracy.morris@mail.wvu.edu

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The following article reviews the literature on childhood anxiety disorders published during the past year. Publication trajectories suggest ever-increasing empirical focus on the nature, developmental influences, assessment and treatment of anxiety in children. The past year saw the most significant events on a national level with respect to public policy development. Despite such forward progress, research on childhood anxiety remains disproportionally behind that of the disruptive behavior disorders. With respect to treatment, cognitive-behavioral approaches have demonstrated strong empirical support. Although there is limited data yet available, selective serotonin reuptake inhibitors appear to be efficacious in treating anxiety in children.

Introduction

Media reports often indicate that we, as a society, are living in an "age of anxiety." Much discussion has surrounded the question of whether or not we are experiencing greater levels of anxiety now than in earlier times. A recent report casts light on this widely debated question. Twenge [1•] analyzed data from 99 samples of children (mean age of 11 years old) who completed the Children's Manifest Anxiety Scale between 1956 and 1988. Anxiety increased in a linear fashion over time. Changes in the divorce rate, birth rate, and crime rate correlated with children's anxiety, and the author concluded that lower connectedness and higher threat led to higher anxiety. Meta-analysis revealed self-reported anxiety among children increased about one standard deviation from the 1950s to the 1980s, lending support to the notion that anxiety is indeed on the rise.

Anxiety disorders are the most prevalent forms of psychiatric problems presenting in children [2]. Unfortunately, there has been a paucity of controlled studies of behavioral or pharmacologic treatment for childhood anxiety disorders relative to that for the disruptive behavior disorders (*eg*, attention deficit hyperactivity disorder [ADHD]). Cursory examination of the publication trajectory for child psychiatric disorders suggests that this disparity may be remedied within the next decade. Accordingly, the lives of untold numbers of children and adults may be improved by the implementation of ongoing research findings. This article reviews the literature published in the past year regarding the etiology, assessment, and treatment of anxiety disorders in children.

Etiology

The sharp increase in the frequency of publications related to the development of anxiety disorders in recent years may be due in part to the influence of the rapidly expanding field of developmental psychopathology [3]. Developmental psychopathology is an integrative framework through which data from diverse areas of focus (*eg*, behavior genetics, learning theory, developmental psychology, and so forth) may be brought together to provide a more complete conceptualization of the origin and course of disorders across the life span. During the past year, the first book to tackle the developmental psychopathology of anxiety was published [4••]. This edited text includes contributions from the major research groups working in child anxiety and provides excellent coverage of known etiologic factors. For a more succinct description of the developmental psychopathology perspective on internalizing disorders see the article by Zahn-Waxler *et al.* [5].

With respect to specific etiologic factors, several studies related to the influence of temperament, attachment, and parenting were published during the past year. Prior *et al.* [6] reported results of their longitudinal investigation of temperament in 2243 infants who were evaluated at approximately 18-month intervals through early adolescence. Impressively, 70% of the original cohort remained in the study through the last assessment interval. Infants and children were classified as temperamentally shy at each assessment point if their scores on the relevant temperament measure for their age group (*ie*, Short Temperament Scale for Infants, Toddler Temperament Scale, Childhood Temperament Questionnaire, EAS

Temperament Questionnaire, School Age Temperament Inventory) placed them one standard deviation or more above the cohort mean. Parent and child reports of anxiety were obtained when the children were ages 13 to 14 years using the Anxiety-Withdrawal scale of the Revised Behavior Problem Checklist. Results demonstrated that temperamental shyness was associated with the later development of anxiety. Persistence of shyness over time was significantly related to the likelihood that a child would experience substantive anxiety problems in adolescence. Persistence was coded as the number of times the child was classified as temperamentally shy across the eight assessment intervals. Of the children who were never classified as temperamentally shy or classified on only one assessment occasion, 11.7% had anxiety problems in early adolescence. In contrast, of those classified as shy on more than six assessment occasions, 42% reported significant anxiety problems in early adolescence. However, it is important to note that temperamental shyness was not found to be a necessary condition for the development of anxiety, as most of the adolescents determined to have anxiety problems (based on diagnostic interview) did not have a history of shyness in early childhood. Goldsmith and Lemery [7] provide a good summary of the literature on temperament and anxiety.

Muris *et al.* [8] investigated attachment style, anxiety, and depression in a sample of 91 12-year-old children (46 girls) recruited from a secondary school in The Netherlands. Children completed self-report measures of attachment, the Screen for Child Anxiety Related Emotional Disorders (SCARED), and the Depression Questionnaire for Children. The majority of children (79.1%) described themselves as securely attached, with the remainder as insecurely attached (7.7% as avoidant; 13.2% as ambivalent). Consistent with expectations, insecurely attached children reported higher levels of anxiety and depression than securely attached children did.

In an investigation of the influence of parental psychopathology and parenting style on social phobia, Lieb *et al.* [9] evaluated 1047 German adolescents at two intervals separated by 20 months (baseline at ages 14 to 17 years old). Interviews also were conducted with 1053 parents of the adolescent participants (1026 mothers, 27 fathers). The prevalence of social phobia among the adolescents was 5.6% (6.9% for girls; 4.2% for boys). Prevalence of probable or definite social phobia among mothers was 13% and 11% among fathers. Adolescent offspring of parents with social phobia had higher rates of social phobia compared with those without parental social phobia (9.6% vs 2.1%). Rates of social phobia also were found to be elevated among adolescents whose parents met criteria for other anxiety, depressive, or alcohol use disorders. The adolescent participants completed the Questionnaire of Recalled Parental Rearing Behavior, and results revealed that higher levels of parental overprotection and parental rejection were associated with increased rates of social phobia in offspring.

Although the specific role cognitive functioning plays in the development and expression of anxiety has not been clearly delineated, numerous studies have implicated cognitive distortions as an associated feature. Muris *et al.* published results of two investigations of threat perception in anxious children. In the first study [10], 105 children (69 girls) ages 8 to 13 years (mean of 10.5 years) recruited from a school in The Netherlands were exposed to stories reflecting three types of anxiety (social, separation, generalized). Children also completed the SCARED and the State-Trait Anxiety Inventory for Children (STAIC), which were correlated with the frequency of threat interpretations in response to the stories, even after controlling for age and gender. In the second study [11], 252 school children (8 to 13 years old) were exposed to ambiguous stories of various social situations. Socially anxious children (based on the Social Anxiety Scale for Children-Revised) displayed lower thresholds for threat perception compared with control children (*ie*, they needed to hear fewer sentences before deciding a story was scary). Socially anxious children also more frequently perceived threats when listening to the stories and displayed higher levels of negative feelings and cognitions in relation to the stories compared with control children.

Toren *et al.* [12] conducted neuropsychologic assessment of 19 children with anxiety disorders (ages 6 to 18 years) and 14 age-matched healthy control patients. Tests administered included the California Verbal Learning Test (CVLT; for verbal processing), Rey Osterneth Complex Figure Test (ROCF; for nonverbal processing), and the Wisconsin Card Sorting Test (WCST; for executive functions). The anxiety group scored lower than the control patients on all measures of the CVLT, and had a significantly greater number of errors, perseverations, and incorrect answers after negative feedback on the WCST. No differences were noted on the ROCF. The authors conclude that child anxiety disorders may be associated with lowered linguistic abilities and cognitive flexibility. Southam-Gerow and Kendall [13] conducted a preliminary examination of the emotion understanding of 17 children for treatment of anxiety disorders and 21 nonreferred children (7 to 15 years, mean of 12 years). The two groups of children did not differ in their ability to understand general emotion cues. However, children in the anxiety disorders group had a less developed understanding of hiding and changing their emotions in comparison with nonreferred children. Emotional understanding was found not related to general intelligence.

Biological factors

Debellis *et al.* [14] used MRI to measure amygdala volumes in 12 children (8 to 16 years old) with generalized anxiety disorder (GAD) and 24 healthy comparison children. Total amygdala volumes were significantly larger in the GAD group. Comparison brain regions (*eg*, intracranial, temporal lobe, hippocampal, and basal ganglia) did not differ

among groups. The authors concluded that dysmorphometry of the amygdala may represent a vulnerability to childhood GAD. Sallee *et al.* [15] administered a Yohimbine challenge to 17 children with anxiety disorders (mean age of 11 years) and 15 age- and sex-matched normal comparison children. Children in the anxiety disorder group reported significant increases in self-reported anxiety. Effects were strongest in the subset of children diagnosed with separation anxiety disorder (SAD). Results suggest that presynaptic norepinephrine sensitivity is associated with anxiety disorders in children. Pine *et al.* [16] administered a 5% CO^2 inhalation to 104 children aged 9 to 17 years (57 with anxiety disorders; 47 healthy comparison). Children in the anxiety disorders group exhibited greater changes in somatic symptoms during inhalation than did healthy comparison children. Effects were most pronounced in children with SAD, although CO^2 hypersensitivity was absent in those with social phobia.

Assessment

Comprehensive assessment incorporates multiple methods across multiple informants and contexts. Behavior may vary across situations. Information should be solicited from parties privy to the situations in which the problem behaviors occur (*eg*, school). Parents should not be considered the gold standard for all information about their children. Mesman *et al.* [17] examined agreement among child-, parent-, and teacher-reports of anxiety and depression (using the STAIC, Dimensions of Depression Profile for Children, Child Behavior Checklist, and the Teacher's Report Form) among 274 Dutch children aged 10 to 11 years. Correlations among informants were generally small or medium. However, correlations were generally higher on child- and teacher-reports compared with child- and parent-reports. The authors suggest that insensitivity of parents to their child's symptoms of anxiety and depression may have been one of the causes of the problems in the first place. The authors also note that unlike most parents, teachers have experience with large numbers of children to make developmental comparisons. Along these lines, in a study of 239 children (aged 7 to 15 years; mean of 11 years) diagnosed with an anxiety disorder, Krain and Kendall [18] found that parents (193 fathers; 238 mothers) reported higher levels of anxiety in their children than the children self-reported. Parent reports of child anxiety were more correlated with the self-reports of younger children compared with older children. Mothers and fathers reports were more highly correlated with sons' self-reports than with daughters' self-reports. When information is found to differ across informants, potential reasons for disagreement should be examined. Mash and Dozois [19] noted several potential reasons why multiple informants may present discrepant information: 1) bias or error on the part of one of the informants; 2) variability in child behavior across situations observed by the informants; 3) lack of access to specific behavior (*ie*, thoughts, feelings); 4) denial of the problem; or 5) active distortion of information in service of some goal. Schniering *et al.* [20] provides a thorough review of diagnostic issues and assessment methods for childhood anxiety disorders.

Clearly, one of the most common means to obtain information on anxiety symptoms in children is through the use of self-report questionnaires. During the past year, several reports of the psychometric properties of specific self-report measures were published. Muris *et al.* [21] examined associations among the SCARED and the Spence Children's Anxiety Scale (SCAS) in 1011 Dutch school children (487 girls) aged 7 to 19 years (mean of 12.77). In general, good correlations were found between the SCARED and the SCAS. However, the correlation between the social phobia subscales of the two measures was relatively low (0.49). By way of explanation, the authors note that the SCARED addresses issues of fear of unfamiliar people, whereas the SCAS focuses on social performance fears. The authors conclude that the SCAS may have stronger psychometric properties and should be used for research purposes, but that the SCARED adds additional and more detailed information that may be useful for treatment planing and assessment of outcome.

Extending previous work, two investigations of self-report measures of social anxiety in children and adolescents were published during the past year. Inderbitzen and Walters [22] provided normative data and construct validation of the Social Anxiety Scale for Adolescents (SAS-A) for a sample of 2937 junior high and senior high school students (1506 girls). This report provides the most comprehensive normative data yet for the SAS-A. Consistent with expectations, girls reported higher levels of social anxiety than boys. Additionally, junior high school students reported higher levels of social anxiety than senior high school students, providing support for the notion that the early adolescent age period is particularly challenging from a social interaction perspective. Beidel *et al.* [23] provide data on the external and discriminative validity of the Social Phobia and Anxiety Inventory for Children (SPAI-C) among 254 children aged 8 to 14 years (mean of 10.9 years; 123 girls) who had participated in one of two research projects examining psychopathology and treatment of anxiety disorders in children (63 diagnosed with social phobia; 32 diagnosed with other anxiety disorders; and 159 normal control participants who did not meet criteria for any diagnosis). Behavioral validation was examined through read-aloud and role-play tasks. SPAI-C scores were significantly correlated with independent observer's ratings of the children's anxiety and effectiveness in the behavioral tasks and the children's ratings of their own distress. The SPAI-C successfully discriminated not only between children with social phobia and normal controls, but also between children with social phobia and children with other anxiety disorders. This is quite notable given that other anxiety assessment instruments generally

have failed to differentiate among children of varying diagnostic groups.

Treatment

The past year brought several noteworthy contributions to the growing literature on cognitive-behavioral interventions for anxiety disorders in children. Flannery-Schroeder and Kendall [24•] published results of a clinical trial in which children were randomized to individual cognitive behavioral therapy (CBT), group CBT, or wait-list. Following treatment, 73% of children who received individual CBT and 50% of those who received group CBT no longer met criteria for their primary anxiety disorder—in contrast to 8% of children assigned to the wait-list condition. Berman *et al.* [25] examined predictors of outcome in 106 children aged 6 to 17 years (50 girls) who had participated in one of two randomized clinical trials of cognitive-behavioral treatment for childhood anxiety disorders. Children were classified as treatment successes (n=80; defined as no longer meeting diagnostic criteria or a four-point reduction on the eight-point clinician's severity rating scale) or treatment failures (n=26). No significant differences were found among groups with respect to age, gender, ethnicity, family income, primary diagnosis, or severity. However, children in the failure group were more likely to have comorbid depression. Global severity ratings on the Symptom Checklist-90 and Beck Depression Inventory were significantly higher for parents of children in the treatment failure group. Notably, parental psychopathology was a significant predictor of outcome only for younger children.

Beidel *et al.* [26•] provided the first published study to report the results of a controlled trial of behavioral treatment for social phobia in preadolescent children. Fifty children (8 to 12 years old) were randomized to Social Effectiveness Therapy for Children (SET-C) or an active treatment for improving study and test taking skills. The duration of each program was 12 weeks, and the programs were equivalent in terms of therapist-participant contact. Components of the SET-C program included parent education, social skills training, peer generalization, and graduated in vivo exposure. One group social skills training session and one individual graduated in vivo exposure were held each week. Strategies used to teach and reinforce appropriate social behavior included instruction, modeling, behavior rehearsal, feedback, and social reinforcement. Topic areas included nonverbal social skills, initiating and maintaining conversations, joining groups of children, friendship establishment and maintenance, positive assertion, and negative assertion. A unique and essential component of SET-C is the use of formalized peer interaction experiences to assist in the generalization of social skills to situations outside the clinic. "Normal" child volunteers were recruited from the community to serve as peer facilitators in the peer generalization experiences (developmentally appropriate group recreational activities, *eg*, roller skating). Following treatment, 67% of the SET-C group no longer met criteria for social phobia compared with 5% for the active comparison treatment. Statistically significant improvements were noted in self-reported anxiety, observed social skill and performance, and functioning in daily encounters. Treatment gains were maintained over a 6-month follow-up period.

The family context

An evaluation of the family context is essential for effective assessment and treatment. Patterns of familial aggregation of anxiety disorders have been identified through epidemiologic studies. Recognizing the impact of anxiety on the family system, and the potential for family members to inadvertently participate in the maintenance of an anxiety disorder, efforts toward incorporating family members in treatment are becoming more common. Toren *et al.* [27] reported the results of brief parent-child group CBT for childhood anxiety disorders. Twenty-four children (10 girls) aged 6 to 13 years (mean of 9.6 years old) and their parents (27 mothers, 13 fathers) attended ten sessions through a community mental health center in Tel-Aviv, Israel. Diagnostic status of the child participants was as follows: 52% with SAD, 4% with overanxious disorder, 44% with both SAD and GAD. The children had received no prior pharmacotherapy. Group sessions were conducted by two therapists each and were 80 minutes in duration. Session content included such topics as relaxation techniques, automatic self-talk, cognitive pitfalls, avoidant strategies, graded exposure, coping skills, and problem-solving techniques. Although parents participated in the treatment, parental symptoms of anxiety were not directly addressed. Significant reductions were obtained following treatment on the Revised Children's Manifest Anxiety Scale, and 70% of the children no longer met criteria for any current anxiety disorder. A 36-month follow-up was conducted with 22 children and 91% were found to be diagnosis-free.

Pharmacotherapy

Velosa and Riddle [28••] critically reviewed the literature on pharmacotherapy for anxiety disorders in children, and concluded that selective serotonin reuptake inhibitors (SSRIs) are the most safe and efficacious medications. Murphy *et al.* [29] provided an excellent review of the use of SSRIs in the treatment of anxiety in children. The authors conclude that there is robust evidence supporting the use of SSRIs with obsessive compulsive disorder, some support for GAD, social phobia, selective mutism, and panic disorder, although there is insufficient data regarding the efficacy of SSRI treatment for posttraumatic stress disorder in children.

Developmental Issues

A common clinical assumption is that intervention tends to be more effective when implemented earlier, opposed to

later in the individual's life-span. It is generally believed that behavior patterns are less well established in young children, and are thus more responsive to change. No doubt, certain approaches will be demonstrated to be more effective within specific age periods compared with other treatment approaches. Too often, efforts toward intervention with children have reflected mere downward extensions of work with adults. Developmental considerations must be given due attention in the delivery of pharmacologic and cognitive-behavioral intervention. Barrett [30] provided an excellent discussion of developmental issues in the treatment of childhood anxiety disorders.

Call to Action

The year 2000 was exceptional in terms of national focus on mental health issues—particularly as relevant to children. February 2000 hailed the release of the monograph from the Conference on Treating Anxiety Disorders in Youth co-sponsored by the Anxiety Disorders Association of America and the National Institute of Mental Health [31]. The conference (held in October 1998) was a significant event bringing together the major researchers, treatment professionals, and policy makers in the area of childhood anxiety disorders. An important outcome was the generation of a consensus statement (available online at www.adaa.org) outlining the current knowledge and future research needs with respect to the diagnosis, treatment, and prevention of anxiety disorders in children and adolescents. In September 2000, the US Surgeon General held a Conference on Children's Mental Health (the report of which was released January 2001 and is available at www.surgeongeneral.goc/cmh). This was a monumental event in public health policy development and promises to spur an increase in funded research related to the etiology, assessment, and treatment of psychiatric disorders in children. The national focus on children's mental health continued in October 2000 when the National Institute of Mental Health and the Food and Drug Administration held a conference on Psychopharmacology for Young Children.

Conclusion

Significant advances have been made with respect to our understanding of anxiety disorders in children, yet the vast prevalence of anxiety in children and adults warrants increased empirical focus. The more we learn about etiological factors, the better able we will be to form and implement prevention and early intervention programs. Such programs are needed to reduce the vast human suffering and financial cost to society generated as a consequence of anxiety disorders. At present there is strong evidence to support cognitive-behavioral approaches and modest evidence to support SSRI treatment of anxiety in children. Future research is needed to identify which children will benefit most from which forms of treatment, and the utility of combined pharmacological and behavioral treatment.

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