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External Validation of Comorbid Patterns of Anxiety Disorders in Children and Adolescents

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Abstract

To evaluate the external validity of comorbid patterns of anxiety disorders among youth who presented to an anxiety disorders clinic, comorbid cases were compared to “pure” anxiety disorder cases. Children and adolescents ($N = 329$; mean age = 10.04 years) and parents were administered structured interviews and four groups were formed, Pure Anxiety, Anxiety + Anxiety, Anxiety + Externalizing, and Anxiety + Depressive, and compared along 4 external validation criteria: sociodemographics, clinical phenomenology, psychosocial, and family factors. All comorbid groups were more severe than the pure anxiety group on clinical phenomenology and psychosocial factors. The Anxiety + Depressive Disorders group was most severe on all criteria except sociodemographics. Results provide evidence for the external validity of comorbid diagnostic presentations among anxiety disorders, as there was differential meaningfulness in the diagnostic presentation of a pure anxiety disorder versus anxiety disorder comorbid with other disorders. Assessment and future research implications are discussed.

High rates of comorbidity across child and adolescent psychiatric disorders, in general, and anxiety disorders, in particular, have been documented in clinical and community studies with higher rates in the former than latter (Costello et al., 1988; Feehan, McGee, Raja, & Williams, 1994; Kashani & Orvaschel, 1988; Strauss & Last, 1993). Early review articles on comorbidity questioned whether the observed high rates of comorbidity were artifactual, citing methodological problems in early studies and a failure to identify covariation between syndromes (Caron & Rutter, 1991). Angold, Costello, and Erkanli (1999), however, provided results from a meta-analysis of 21 community-based studies that substantiated high rates of comorbidity even in studies in which methodological factors were controlled. It appears therefore that the ubiquitous presence of comorbidity is “factual,” highlighting a need to further validate comorbid disorder subtypes in efforts to improve the current nosology. Validation of comorbid disorder subtypes would be a step beyond most of the existing research, which has

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primarily focused on describing comorbid patterns. Calls have been made in the literature (Jensen, Martin, & Cantwell, 1997) to move beyond the description of comorbid patterns, and to examine whether comorbid patterns represent unique syndromes.

As Jensen et al. (1997, 2001) noted, examining interaction of two or more disorders may determine whether specific comorbid patterns convey unique information. According to Cantwell (1995), once the clinical phenomenology of a disorder has been clearly defined and subtyped, meaningful investigations can be undertaken in other stages or domains to provide evidence of external validity of comorbid disorders. That is, if comorbid disorders could be distinguished from “pure” disorders along specified validation criteria, it would provide evidence for the external validity of the comorbid disorder indicating unique information not evident in the pure disorder. Cantwell delineated seven domains for evaluating external validity: a) sociodemographics, b) clinical phenomenology, c) family factors, d) psychosocial factors, e) biological factors, f) response to treatment, and g) clinical outcomes. According to Cantwell (1995), if comorbid disorders can be distinguished from “pure” disorders along these criteria, it would provide evidence for the external validity of the comorbid disorder, indicating unique information not evident in the pure disorder.

This type of external validation strategy for comorbid disorders has been rarely done. Jensen et al. (1997, 2001) investigated whether there was differential meaningfulness in disorders comorbid with attention deficit hyperactivity disorder (ADHD) in 579 children (ages 7 to 10 years) referred to the MTA study (MTA cooperative group, 2001). Four groups were formed, pure ADHD (n = 184), ADHD comorbid with an anxiety disorder (n = 81), ADHD comorbid with conduct disorder (CD)/oppositional defiant disorder (ODD) (n = 171), and ADHD comorbid with conduct disorder/oppositional defiant disorder *and* anxiety disorder (n = 143). Results indicated that the four diagnostic presentations could be differentiated by age, clinical phenomenology, and family factors such as parenting, and treatment response. This study thereby represents an important first study in the external validation of comorbid patterns of ADHD in children.

Lewinsohn and colleagues (Lewinsohn, Rohde, & Seeley, 1995; Rohde, Lewinsohn, & Seeley, 1991) investigated whether there was differential meaningfulness in presentations of comorbid versus pure disorders, including anxiety disorders in adolescent community samples. Adolescents with comorbid anxiety + depressive disorders were significantly older than adolescents with a pure anxiety disorder (Rhode et al., 1991). Significantly more adolescents with anxiety disorders comorbid with other disorders (i.e., anxiety, depressive, substance use, CD, ADHD, and ODD) received psychiatric treatment and had reported significantly higher suicide attempts than youth with pure anxiety.

A small number of studies has described comorbidity patterns in youth referred to anxiety disorders specialty clinics (Kendall, Brady, & Verduin, 2001; Last, Strauss, & Francis, 1987; Strauss, Last, Hersen, & Kazdin, 1988; see Saavedra & Silverman, 2002 for review). In Last et al.'s (1987) investigation (N = 73; ages 5 to 18 years), for example, the majority of youth received one or more diagnosis, with the most common diagnosis being another anxiety disorder, followed by depression and ADHD. Strauss et al. (1988) compared 5- to 17-year-old youth with anxiety disorders comorbid with depressive disorders (n = 30) to youth with pure anxiety disorder (n = 76) along sociodemographics and clinical phenomenology. Youth referred to a general outpatient clinic for CD, ADHD, ODD, and adjustment disorder comprised a comparison control group (n = 34). Youth with anxiety disorders + depressive disorders were significantly older than youth with pure anxiety disorder. In addition, the anxiety disorders + depressive disorders group had higher self ratings than the pure anxiety disorder and the comparison control groups on all variables examined: state anxiety, trait anxiety, manifest anxiety, and fear levels.

The purpose of the present study was to further evaluate the external validity of comorbid anxiety patterns in a clinic sample of youth by examining whether children and adolescents who present with comorbid anxiety disorders differ in meaningful ways from youth who present with a pure anxiety disorder. Similar to Strauss et al. (1988), youth with anxiety disorders comorbid with depressive disorders were compared to youth with a pure anxiety disorder. The study included two additional comorbid groups that have frequent co-occurrence: (1) anxiety disorder + other anxiety disorders and (2) anxiety disorder + externalizing disorders. These groups were compared not only along sociodemographic factors and clinical phenomenology (Strauss et al., 1988), but along additional criteria suggested by Cantwell (1995): psychosocial (i.e., extracurricular activities, quality of peer relationships, and academic performance) and family factors (i.e., parent psychopathology). By so doing, the present study includes more extensive external validation criteria as Cantwell (1995) and Jensen et al. (1997) recommended. Given the paucity of research it was premature to formulate specific hypotheses; however, evidence suggests that the pure anxiety disorder group may differ from the comorbid anxiety disorder groups in terms of clinical phenomenology and psychosocial factors. The anxiety disorders + depressive disorder comorbid group also is expected to show greater severity than the pure anxiety disorder group in terms of clinical phenomenology (Strauss et al., 1988).

Method

Participants

The sample consisted of 329 children and adolescents and their parents (89.4% mothers) who presented to a child anxiety specialty research clinic. Table 1 presents additional sociodemographic information. Inclusion criteria were a primary DSM-IV anxiety disorders diagnoses. Exclusionary criteria were developmental (e.g., mental retardation) and psychotic disorders (e.g., childhood schizophrenia).

Diagnosticians

All interviews were conducted by graduate students in psychology. Diagnosticians were extensively trained in the administration of the Anxiety Disorders Interview Schedule for DSM-IV: Child and Parent Versions (ADIS for DSM-IV: C/P; Silverman & Albano, 1996). Training consisted of having several meetings on how to conduct the interview and diagnose DSM-IV anxiety disorders, depression, externalizing disorders, and other related childhood disorders. The diagnosticians were required to observe five separate child-parent interviews and match on five consecutive diagnoses. The diagnosticians also were required to conduct an interview under observation by Dr. Silverman and match diagnoses with her. This required agreement on all diagnoses assigned to the particular youth based on the composite (combined) diagnoses (see Procedures below). In addition, diagnosticians were required to agree on the order of diagnoses (primary, secondary, tertiary).

Diagnosis

Anxiety Disorders Interview Schedule for DSM-IV—Child and Parent Versions (ADIS for DSM-IV: C/P; Silverman & Albano, 1996) was administered to all referred youth and one of their parents (89.4% mothers). The interview contains modules for prevalent psychiatric disorders including anxiety, mood (i.e., major depression, dysthymia) and externalizing disorders (ADHD, ODD, and CD). A subsample (20%) served as participants in a diagnostic retest reliability study (Silverman et al., 2001), which found good to excellent retest reliability for combined diagnoses of anxiety disorders ($\kappa = 0.80$ to 0.92), depression ($\kappa = 0.67$ to 0.88) and ADHD ($\kappa = 0.61$ to 1.00).

Classification of Comorbid Groups—Participants who met diagnostic criteria for only one anxiety disorder were classified as (1) Pure Anxiety Disorders (ANX; $n = 77$). Participants who met criteria for a primary anxiety disorder diagnosis plus an additional anxiety disorder (s) were classified as (2) Anxiety + Anxiety Disorders (ANX + ANX; $n = 136$). Participants who met for a primary anxiety disorder diagnosis plus an externalizing disorder [e.g., ADHD, ODD, or CD] were classified as (3) Anxiety + Externalizing Disorders (ANX + EXT; $n = 93$). Participants who met for a primary anxiety disorder diagnosis plus major depression or dysthymia were classified as (4) Anxiety + Depressive Disorders (ANX + DEP; $n = 23$) (See Procedures for further details.)

Measures

All the study's measures assess specific factors within Cantwell's (1995) criteria of sociodemographic factors, clinical phenomenology, psychosocial factors, and family factors. They were administered to determine whether the comorbid groups can be distinguished from the “pure” anxiety disorder group along these criteria. Unless otherwise indicated, raw scores were used in subsequent analyses.

Sociodemographic Characteristics

Sociodemographic data were collected via an information sheet completed by the parent. The groups were compared for child age, sex, race/ethnic identification and socioeconomic status (SES).

Clinical Phenomenology

Revised Children's Manifest Anxiety Scale—(RCMAS; Reynolds & Richmond, 1978). The RCMAS contains 37 items designed to assess anxiety symptoms. Twenty-eight items are summed yielding a Total Anxiety score. The other nine items yield a Lie score. Respondents indicate either *Yes* or *No* to each item. Pela and Reynolds (1982) reported retest reliability of $r = 0.98$ for the Total Anxiety scale using a 3-week interval. In this sample, the Total Anxiety scale's internal consistency (Cronbach's alpha) was 0.84. Estimates of concurrent validity for the RCMAS have been found to range from (r s) 0.76 to 0.65 (Lee et al., 1988).

Revised Fear Survey Schedule for Children—(FSSC-R; Ollendick, 1983). The FSSC-R contains 80 items designed to assess the intensity of youths' fears. Youth rate how afraid they are of each object or situation listed by the item using a 3-point scale: *None* (1), *Some* (2), or *A Lot* (3). The FSSC-R has acceptable test-retest reliability (r s ranging from 0.46 to 0.51) and internal consistency (e.g., coefficient alpha of 0.95; Ollendick, 1983). In this sample, the Total Fear scale's internal consistency (Cronbach's alpha) was 0.79. Significant correlations have been found between the FSSC-R and widely used anxiety self-report measures (r s ranging from 0.32 to 0.56; Ollendick, 1983).

Children's Depression Inventory—(CDI; Kovacs, 1981). The CDI contains 27 items designed to assess cognitive, affective, and behavioral symptoms of youth depression. For each item, respondents select one of three choices that best describe themselves over the past 2 weeks. The CDI has acceptable test-retest reliability (r s = 0.72) and internal consistency (e.g., coefficient alpha of 0.83; Smucker et al., 1986). In this sample, the Total Depression scale's internal consistency (Cronbach's alpha) was 0.87. The CDI has been found to discriminate between psychiatric and non-clinic samples; the CDI also has been found to correlate with clinicians' independent global depression ratings ($r = 0.55$; Kovacs, 1992).

Child Behavior Checklist—(CBCL; Achenbach, 1991). The CBCL contains 118 items to which parents to rate as *Not True* (0), *Somewhat or Sometimes True* (1), or *Very True or Often*

True (2) of their child. The CBCL yields broadband internalizing and externalizing factors and eight specific narrow-band factors. The CBCL has a mean retest reliability of 0.89 over 1 week and 0.75 over 1 year. Significant correlations have been found between the CBCL and other behavior rating scales (e.g., $r = 0.91$; Achenbach & Edelbrock, 1983). The Internalizing and Externalizing T scores were used in this study with Cronbach's alphas of 0.82 and 0.76, respectively. Concurrent validity has been found between the CBCL and Connors Parent Questionnaire (r s ranging from 0.56 to 0.86; Achenbach & Edelbrock, 1983).

Psychosocial Factors

Child Behavior Checklist—(CBCL; Achenbach, 1991). Information about extracurricular activities, quality of peer relationships, and academic performance was gathered using the CBCL (Achenbach, 1991). Regarding extracurricular activities, parents indicate the athletic and nonathletic activities in which their child participates and the numbers of activities are summed to provide a total extracurricular involvement score. The extracurricular item has a mean retest reliability of 0.70 over 1 week (Achenbach, 1991).

Regarding peer relationships, parents rate how well their child gets along with peers relative to other children his/her age [i.e., worse (0), about average (1), or better (2)]. This CBCL item has a mean retest reliability of 0.92 over 1 week (Achenbach, 1991). Regarding academic performance, parents rate their child's performance [i.e., failing (0), below average (1), average (2), or above average (3)] in four academic subjects (reading, history, math, and science). Parents' ratings across the four subjects were averaged to provide a mean score for academic performance; mean scores could range from 0 to 4. This item has a mean retest reliability of 0.92 over 1 week (Achenbach, 1991).

Family Factors: Parent Psychopathology

Symptom Checklist- 90—(SCL-90; Derogatis, 1983). The SCL-90 contains 90 items designed to assess adult psychological symptom status. Items are rated on a 5-point scale of distress ranging from not at all (0) to extremely (4). The SCL-90 Total Score was used in the present study. In this sample, the Total Score's internal consistency (Cronbach's alpha) was 0.98. Convergent validity for the SCL-90 is well established (Derogatis, 1983). Convergent validity between the SCL-90 and MMPI has been found (r s ranging from 0.50 to 0.84; Derogatis, 1983).

Procedure

Assessment and Diagnosis—Administration of the measures was conducted in two sessions within a 2-week period. During the first session, parents and youth signed informed consent/assent forms and the interview schedules and questionnaires were administered. Remaining questionnaires were completed in the second session.

For comorbid cases, the procedure for determining which disorder was primary involves consideration of the clinician severity ratings. For each diagnosis the interviewer consults separately with the youth and parent using a 9-point "Feelings Thermometer" scale to prioritize the multiple diagnoses. To warrant a final diagnosis on the child and/or parent interview, the severity rating for each diagnosis must be 4 or greater. The interviewer takes the diagnosis that both sources agree is most interfering as primary. In instances of discordance, the clinician adjusts the severity ratings by considering both sources' views about interference, as delineated in the ADIS-C/P guide (Albano & Silverman, 1996). For example, if a parent views a problem as extremely/severely interfering but the child views it as moderately interfering, then the combined diagnosis severity rating will reflect "between" the two views. Flexibility is permitted in determining severity ratings and priority ranking of diagnoses as circumstances may arise that necessitate greater reliance on one source over another (e.g., with the non-

compliant child more reliance would be placed on the parent interview). In all cases, severity ratings and the priority ranking of the diagnoses are carefully reviewed and discussed at weekly staff meetings and confirmed with the program director.

Results

Sociodemographic Characteristics

Table 1 presents the sociodemographic characteristics of the four groups (i.e., ANX only, ANX + ANX, ANX + EXT, and ANX + DEP). Initial chi-square and ANOVAs revealed no significant proportion or mean differences in participants' sociodemographic characteristics (i.e., age, sex, race, SES), though differences among the four groups approached significance for age and sex ($p < .063$ for age and $p < .07$ for sex). Participants in the ANX+DEP group were older than those in the other diagnostic groups, and there were more boys than girls in the ANX + EXT than in the other groups.

Clinical Phenomenology

Because the five dependent variables of clinical phenomenology (i.e., RCMAS Total Anxiety, FSSC-R Total, CDI Total, CBCL Internalizing, and CBCL Externalizing problem scores) are not orthogonal, clinical phenomenology was first examined using a one-way multivariate analysis of covariance (MANCOVA) to examine the four groups on these variables, controlling for number of diagnoses (range 0 to 5 disorders). Number of diagnoses was controlled to ensure that any significant differences observed among the comorbid groups were not due to youth in any one of these groups having more disorders. Means and standard deviations are presented in Table 2. Statistically significant differences were found for the clinical phenomenology variables, Wilks's $\Lambda = .902$, $F(5, 323) = 3.12$, $p > .001$. The multivariate η^2 based on Wilks's Λ was .34.

Next, the mean scores of the four groups (i.e., ANX only, ANX + ANX, ANX + EXT, and ANX + DEP) were compared in a series of one-way analyses of variance (ANOVAs), with planned follow-up analyses controlling for number of diagnoses. Effect sizes (expressed as d statistics) were calculated with the conventional pooled standard deviations (Cohen, 1988; Rosnow & Rosenthal, 1996). In terms of *anxiety*, statistically significant differences were found across the four groups for the RCMAS total anxiety score, $F(3, 326) = 6.29$, $p < .001$; $\eta^2 = .27$, controlling for number of diagnoses. Holm's modified Bonferroni pairwise comparisons¹ (corrected alpha set at .01) indicated that each of the three comorbid groups (i.e., ANX + ANX, ANX + EXT, and ANX + DEP) had significantly higher mean RCMAS scores than the ANX only group ($p < .001$); ANX + EXT ($d = .5$), ANX + DEP ($d = .2$). The ANX + DEP group had statistically significantly higher mean RCMAS scores than the ANX + ANX group ($p < .001$) ($d = .5$). There were no statistically significant differences in RCMAS total scores between the ANX + EXT group and the ANX + ANX group.

In terms of *fear*, statistically significant differences were found across the four groups for the FSSC-R Total Fear score, $F(3, 326) = 4.09$, $p < .001$; $\eta^2 = .024$, controlling for number of diagnoses. Holm modified Bonferroni pairwise comparisons (corrected alpha set at .01) indicated that the three comorbid groups (i.e., ANX + ANX, ANX + EXT, and ANX + DEP) had significantly higher mean FSSC-R total fear scores than the ANX only group ($p < .01$): ANX + ANX ($d = .4$); ANX + EXT ($d = .3$); ANX + DEP ($d = .4$). When the four diagnostic groups were compared to each other, no significant differences emerged.

¹The Holm's modified Bonferroni correction was applied as it is appropriate for attending to Type I errors when multiple comparisons are conducted. We would like to note that our results do not change with or without the correction (most p values that reached significance were .01 or lower and p values that did not reach significance were above .05). However to be conservative, we wanted to use the correction because of the number of comparisons we conducted.

In terms of *depression*, statistically significant differences were found across the four groups for the CDI total score, $F(3, 326) = 6.72, p < .001; \eta^2 = .068$, controlling for number of diagnoses. Holm modified Bonferroni pairwise comparisons (corrected alpha set at $=.01$) indicated that the ANX + DEP group had statistically significantly higher mean CDI total scores than the ANX only group ($d = .8$), ANX + ANX group ($d = .1$), and ANX + EXT group ($d = .3$) ($p < .01$).

In terms of *internalizing behavior problems*, statistically significant differences were found across the four groups for the CBCL Internalizing T-score, $F(3, 309) = 12.44, p < .001$, controlling for number of diagnoses. Holm modified Bonferroni pairwise comparisons (corrected alpha set at $=.01$) indicated that all three comorbid groups (i.e., ANX + ANX, ANX + EXT, and ANX + DEP) had statistically significantly higher mean CBCL Internalizing Scores than the ANX only group ($p < .01$): ANX + ANX ($d = .7$); ANX + EXT ($d = .8$); ANX + DEP ($d = .1$).

In terms of *externalizing behavior problems*, statistically significant differences were found across the four groups for the CBCL Externalizing T-score, $F(3, 309) = 14.23, p < .05$ controlling for number of diagnoses. Holm modified Bonferroni pairwise comparisons (corrected alpha set at $=.01$) indicated that the ANX + EXT group had significantly higher mean CBCL externalizing scores than the ANX only ($d = .9$ and ANX + ANX ($d = 3.1$ groups ($p < .001$). No significant differences were found when compared with ANX + DEP groups.

Psychosocial Factors

A one-way MANCOVA was conducted to examine mean differences across the four groups on the three dependent variables of psychosocial factors (i.e., CBCL ratings of extracurricular involvement, CBCL ratings of quality of peer relationships, and CBCL ratings of academic performance) controlling for number of diagnoses. Means and standard deviations are presented in Table 3. Statistically significant differences were found for all the psychosocial variables, Wilks's $\Lambda = .902, F(3, 324) = 2.02, p > .01$. The multivariate η^2 based on Wilks's Λ was $.18$.

The four groups were compared along the three measures of psychosocial factors (i.e., involvement in extracurricular activities, quality of peer relationships, and academic performance) using followup one-way ANOVAs. In terms of *involvement in extracurricular activities*, statistically significant differences were found across the four groups, $F(3, 326) = 12.27, p < .001, \eta^2 = .018$. Holm modified Bonferroni pairwise comparisons (corrected alpha set at $=.01$) indicated that participants in the ANX only group were involved in significantly more extracurricular activities than participants in each of the three comorbid groups (i.e., ANX + ANX ($d = .8$); ANX + EXT ($d = 2.8$), and ANX + DEP ($d = 3.2$). Further, the ANX + ANX group was involved in significantly more extracurricular activities than the ANX + EXT ($d = 1.9$) and ANX + DEP groups ($d = 2.3$), $p < .01$.

To examine differences in *peer relationships*, the four groups were compared along parent ratings on the CBCL item VI-b that asks parents to indicate how well their child gets along with peers relative to other children his/her age. Results indicated that the ANX only group were rated significantly higher (as having better peer relationships) than the ANX + EXT ($d = .3$) and ANX + DEP ($d = .4$) groups $F(3, 326) = 3.75, p < .05$. No significant differences were found between the ANX only and ANX + ANX groups.

In terms of *academic performance*, the four groups were compared along the average parent ratings of academic performance on the CBCL. Results indicated that the ANX only group had significantly higher levels of academic performance than the ANX + EXT and ANX + DEP

groups $F(3, 305) = 3.24, p < .01; \eta^2 = .18$ (d s were 1.1 and .9, respectively). There were no significant differences between the ANX only and ANX + ANX groups.

Family Factors: Parent Psychopathology

To examine group differences in terms of *parental psychopathology*, ANOVAs were conducted. As shown in Table 3, statistically significant differences were found for the SCL-90 Total score, $F(3, 326) = 4.74, p < .01$. Holm modified Bonferroni pairwise comparisons indicated that parents with children in the ANX + EXT groups endorsed significantly more symptoms in themselves than parents with children in the ANX only group $p < .01$ ($d = .5$).

Discussion

Of the Cantwell (1995) external validation criteria examined in this study, clinical phenomenology did particularly well in differentiating comorbid anxiety disorders from pure anxiety disorders: *All* comorbid groups were significantly different from the pure anxiety disorder group when it came to *all* the indices of clinical phenomenology. That is, youth with a primary anxiety disorder comorbid with other anxiety disorder, a depressive disorder, or an externalizing disorder, rated themselves as having significantly higher levels of anxiety, fear, and depression than youth with pure anxiety disorder. Moreover, these differences showed medium to large effect sizes. This also was found for parents' ratings of their child's behavior problems: youth with diagnostic presentations of ANX + ANX, ANX + DEP, or ANX + EXT were rated by their parents as having significantly higher internalizing and externalizing behavior problems (using the CBCL subscales) than youth with pure anxiety disorder. These findings suggest that clinical phenomenology is a robust external validation criterion, and the distinct comorbid patterns are meaningful with respect to this criterion. Additionally, although it might appear to be a truism that anxiety disorders when comorbid with other conditions lead to greater clinical severity among cases, it is important to emphasize that this "truism," to our knowledge, has *not* undergone empirical scrutiny. Establishing empirically many so-called "truisms" is an important part of the psychology research enterprise, especially because many truisms frequently fail to hold up empirically. Moreover, our goal in this study was to mainly show that when some of Cantwell's external validation criteria are applied to anxiety disorders, differing patterns are observed between single anxiety disorder cases and cases with comorbid conditions, highlighting the possibility of the distinctiveness among anxiety comorbid conditions.

Results also indicated that all three psychosocial factors (i.e., extracurricular activities, quality of peer relationships, and academic performance) differentiated the ANX + DEP and ANX + EXT groups from the pure anxiety disorder group. This finding speaks to the importance of assessing beyond clinical phenomenology, as anxious youth with comorbid conditions of depressive or externalizing disorders show impairment in psychosocial areas that was not observed in youth with either a pure anxiety disorder or with multiple anxiety disorders. Interestingly, only one psychosocial factor, extracurricular activities, differentiated the ANX + ANX group from the pure anxiety disorder group suggesting that the presence of multiple anxiety disorders particularly serves to limit youths' resources for extracurricular participation.

When it came to the parent psychopathology variables, the ANX + EXT group had parents who rated themselves as having more psychopathology symptoms than parents of children in the pure anxiety disorder group. Future research should be conducted to explore whether parental distress is a response to the child's comorbid presentation of an externalizing behavior problem, perhaps because having a child with an externalizing disorder along with an anxiety disorder taxes parents' resources more than having an anxious child.

Of all the external validation criteria of Cantwell (1995), only sociodemographics (i.e., age, sex, race, SES), did not significantly differentiate among the groups. On one hand, this was surprising because significant age and sex differences are commonly observed in comparisons of youth with pure anxiety disorders, pure externalizing disorders, and pure depressive disorders (Kovacs & Devlin, 1998). On the other hand, Strauss et al. (1988) reported that when children ages 5 and 6 were removed from the statistical analyses, the significant age differences were no longer present among all the groups examined (pure anxiety compared to anxiety comorbid with depression).

The study's findings suggest that there might be meaningful distinctiveness with regard to the specific comorbid groups suggesting that comorbidity in the present sample is factual rather than artifactual (Angold et al., 1999; Caron & Rutter, 1991). Significant differences appeared mainly in terms of the ANX + DEP comorbid group relative to the other comorbid groups. Specifically, the ANX + DEP group had higher levels of self rated anxiety than the ANX + ANX group, higher self rated depression than the ANX + ANX and ANX + EXT groups, and less involvement in extracurricular activities than the ANX + ANX group. Strauss et al. (1988) also found that youth with an anxiety disorder comorbid with depression rated themselves as having greater anxiety than youth with a pure anxiety disorder diagnosis. Future research is needed to shed light on potential reasons for the unique pattern of impairment presentation among different criteria (i.e., clinical phenomenology, psychosocial factors, and parental psychopathology) found in the ANX + DEP group.

If the present study's findings are found to be robust in future research, they suggest interesting possibilities about the handling of comorbid conditions in the DSM. Some incorporation of comorbid disorders already appears in the latest version of the International Classification of Diseases (ICD-10) (World Health Organization, 1992), which contains the unitary categories of anxiety disorders (pure disorders) and the comorbid categories of mixed anxiety and depression and other mixed anxiety disorders (which allow for "disorders of conduct"). Given the greater severity observed among comorbid conditions of anxiety disorders, the findings further highlight the importance of conducting thorough and careful diagnostic evaluation in practice.

Limitations and Future Directions

Because the study's sample consisted of a clinic-referred sample of anxious youth, results may not readily generalize to non-referred samples. A clinic-referred sample proved useful, however, because higher base rates of comorbid conditions (Angold et al., 1999) allowed for comparisons among diagnostic presentations. The current clinic-referred sample allowed for an examination of youth with pure *and* comorbid disorders, all from a help-seeking sample, which serves as a control for severity due to referral status.

In addition, although the present study employed a relatively large sample compared to previous studies (Lewinsohn et al., 1995; Strauss et al., 1988), comparisons among specific anxiety disorders were not possible due to sample size restrictions. Future research is needed to examine potential differences among specific anxiety disorders (e.g., separation anxiety disorder comorbid with depression vs. pure separation anxiety disorder). Also, given sample size constraints, the present study combined externalizing disorders (ADHD, CD, and ODD). Future research should examine separate diagnostic presentations of ANX + ADHD and ANX + CD/ODD. Future studies also might examine for differences along Cantwell's (1995) criteria using a dimensional approach to comorbidity via examination of symptoms while controlling for symptoms (if present) that overlap among multiple disorders.

Although our findings indicate statistically significant differences in terms of psychosocial factors, results were based on single parent-report items from the CBCL. Although these items

have been reported as having satisfactory retest reliability (Achenbach, 1991), future research should examine multiple psychosocial factors using a broader range of items. Finally, examination of the other diagnostic validation criteria discussed by Cantwell requires additional empirical attention including biological factors and treatment response.

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Table 1
Frequencies and Percentages of Sociodemographic Characteristics by Comorbid Group

	<u>ANX only n=77</u>	<u>ANX + ANX n=136</u>	<u>ANX + EXT n=93</u>	<u>ANX + DEP n=23</u>
Age Mean years	10.33 (3.02)	9.65 (3.03)	10.12 (3.01)	11.13 (2.54)
Mean number of Comorbid disorders	-----	2.32	2.12	2.83
Ethnicity/Race	n %	n %	n %	n %
Euro-American	30 (38.96)	37 (27.2)	47 (50.53)	13 (56.53)
Hispanic/Latino	37 (48.05)	43 (31.6)	40 (43.01)	10 (43.47)
African American	1 (1.29)	49 (36.0)	4 (4.31)	-----
Other	9 (11.7)	7 (5.2)	2 (2.15)	-----
Gender				
Male	37 (48.05)	60 (44.11)	59 (63.44)	11 (47.83)
Female	40 (51.95)	76 (55.89)	34 (36.56)	12 (52.17)
Annual Income				
\$ <0-11,999	4 (5.19)	14 (10.29)	18 (19.35)	2 (8.69)
12,000-20,000	10 (12.98)	18 (13.24)	12 (12.90)	4 (17.39)
21,000-30,999	13 (16.89)	20 (14.70)	12 (12.90)	7 (30.44)
31,000-40,999	6 (7.79)	14 (10.29)	12 (12.90)	1 (4.35)
41,000-50,000	16 (20.78)	23 (16.92)	18 (19.35)	2 (8.69)
over 51,000	21 (27.28)	38 (27.94)	19 (20.44)	6 (26.09)
Not Reported	7 (9.09)	9 (6.62)	2 (2.16)	1 (4.35)

Note. ANX only= Child met diagnostic criteria for one anxiety disorder only; ANX +ANX= Child met diagnostic criteria for multiple anxiety disorders; ANX + EXT= Child met diagnostic criteria for an anxiety disorder and an externalizing disorder; ANX + DEP= Child met diagnostic criteria for an anxiety disorder and depression or dysthymia.

Table 2
Mean and Standard Deviations for Indices of Clinical Phenomenology Among Comorbid Groups

	ANX only (n=77)	ANX + ANX (n=136)	ANX + EXT (n=93)	ANX + DEP (n=23)
	M (SD)	M (SD)	M (SD)	M (SD)
Clinical Phenomenology				
RCMAS	10.43 (6.42) ¹	12.49 (6.5) ^{1,2}	13.45 (6.86) ¹	15.87 (6.68) ^{1,2}
FSSC-R	128.66 (29.11) ¹	140.92 (31.29) ¹	137.92 (31.99) ¹	141.84 (28.63) ^{1,2}
CDI	8.65 (6.64) ¹	9.40 (7.07) ¹	11.10 (7.43) ¹	14.48 (8.92) ¹
CBCL				
Internalizing	55.10 (13.25) ¹	64.33 (12.28) ¹	66.63 (15.27) ¹	69.37 (14.00) ¹
Externalizing	49.04 (14.35) ^{1,2}	53.01 (12.17) ²	61.17 (10.68) ^{1,2}	57.68 (7.88)

Note. ANX only= Child met diagnostic criteria for one anxiety disorder only; ANX +ANX= Child met diagnostic criteria for multiple anxiety disorders; ANX + EXT= Child met diagnostic criteria for an anxiety disorder and an externalizing disorder; ANX + DEP= Child met diagnostic criteria for an anxiety disorder and depression or dysthymia. RCMAS= Revised Children's Manifest Anxiety Scale; FSSC-R= Revised Fear Survey Schedule for Children; CDI= Children's Depression Inventory; CBCL=Child Behavior Checklist. Values sharing superscripts are significantly different from each other at p<.01 level (after Holm modified Bonferroni correction).

Table 3

Mean and Standard Deviations for Indices of Psychosocial Factors and Parent Psychopathology Among Comorbid Groups

	ANX only (n=77)	ANX + ANX (n=136)	ANX + EXT (n=93)	ANX + DEP (n=23)
	M (SD)	M (SD)	M (SD)	M (SD)
Psychosocial Factors				
CBCL				
Extra-curricular involvement	4.45 (1.15) ¹	3.52 (1.47) ^{1,2}	1.51 (1.22) ^{1,2}	1.03 (1.27) ^{1,2}
Peer relationships				
Gets along with close friends	1.21 (.53) ¹	1.01 (.67)	.57 (.68) ¹	.96 (.76) ¹
Academic performance	2.31 (.89) ¹	2.08 (.93)	1.08 (.87) ¹	1.25 (.83) ¹
Parental Psychopathology				
SCL-90				
Total symptoms	34.85 (40.17) ¹	36.98 (42.35)	56.94 (44.74) ¹	40.47 (48.45)

Note. ANX only= Child met diagnostic criteria for one anxiety disorder only; ANX + ANX= Child met diagnostic criteria for multiple anxiety disorders; ANX + EXT= Child met diagnostic criteria for an anxiety disorder and an externalizing disorder; ANX + DEP= Child met diagnostic criteria for an anxiety disorder and depression or dysthymia. CBCL=Child Behavior Checklist. SCL-90= Symptom Checklist-90. Values sharing superscripts are significantly different from each other at the $p < .01$ level (after Holm modified Bonferroni correction).