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Do Childhood Anxiety Measures Measure Anxiety?

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The Fear Survey Schedule for Children-Revised (FSSC-R), Revised-Children's Manifest Anxiety Scale (RCMAS), and the Modified State-Trait Anxiety Inventory for Children (STAIC-M) are three widely used self-report measures of childhood anxiety. While previous studies have established the reliability of these measures, their validity in discriminating anxious from non-anxious youngsters remains to be established. The present study examines the discriminant validity of the three measures by comparing clinic referred samples of boys with an anxiety disorder (n = 105) or ADHD (n = 59) with a community sample of never-psychiatrically-ill boys (n = 49). Results indicated that the two patient groups differed significantly from the never-psychiatrically-ill group on the RCMAS and STAIC-M, but the anxious and ADHD groups did not differ from each other. None of the three groups differed on the FSSC-R. The implications of these findings for the assessment of childhood anxiety disorders are discussed.

Three widely used self-report measures of childhood anxiety include the Fear Survey Schedule for Children-Revised (FSSC-R) (Ollendick, 1983), the Revised-Children's Manifest Anxiety Scale (RCMAS) (Reynolds & Richmond, 1978), and the Modified State-Trait Anxiety Inventory for Children (STAIC-M) (Fox & Houston, 1983). All three measures have been found to possess moderate to high internal consistency, moderate test–retest reliability, and to correlate well with other measures of anxiety (Fox & Houston, 1983; Ollendick, 1983; Papay & Spielberger, 1986; Reynolds & Paget, 1983; Reynolds & Richmond, 1978; Wisniewski, Mulick, Genshaft, & Coury, 1987). However, their discriminant validity, i.e., ability

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to discriminate anxiety disordered children from children with other types of psychopathology and/or no psychopathology, has yet to be clearly established. This is problematic since many clinicians rely solely on these measures to identify anxious children, since they are easier and less time consuming to administer than structured interviews.

   Previous studies comparing anxious and non-anxious children on the FSSC-R have not yielded a consistent pattern of differences. Higher FSSC-R total fear scores have been found for school phobics vs. normal controls (Ollendick, 1983) and for subclinically anxious subjects vs. normal controls (trend only) (Bell-Dolan, Last, & Strauss, 1990). However, in a recent study, total fear and factor scores on the FSSC-R did not differentiate non-depressed anxiety disordered children from a psychiatric control group (Strauss, Last, Hersen, & Kazdin, 1988).

   Research comparing groups of children on the RCMAS have produced a pattern of findings similar to those observed for the FSSC-R. Mattison, Bagnato, and Brubaker (1988) found anxiety disordered children to have significantly higher scores on the worry/oversensitivity subscale of the RCMAS than psychiatric controls. They also successfully classified 68% of the total sample using a cutoff score of $T > 60$ on this subscale (Mattison et al., 1988). Significant differences also were found on the RCMAS between normals and anxiety disordered subjects with/without somatic complaints on the physiological scale (Last, 1991), and between subclinically anxious and non-anxious controls for total RCMAS scores (Bell-Dolan et al., 1990). Alternatively, others have found no differences on the RCMAS between children with overanxious disorder and those with dysthymia and ADHD (Mattison & Bagnato, 1987), or between anxiety disordered children and psychiatric controls (Hoehn-Saric, Maisami, & Wiegand, 1987; Hodges, 1990; Strauss et al., 1988).

   Although there are fewer studies comparing anxious and non-anxious children on the STAIC-M, a more consistent pattern of differences has emerged. Last (1991) found higher scores on the somatic-trait-anxiety subscale of the STAIC-M for anxiety disordered children with somatic complaints when compared to anxiety disordered children without somatic complaints and normal controls. Bell-Dolan et al. (1990) found higher trait-anxiety scores for subclinically anxious children vs. non-anxious controls. Hodges (1990) also found the trait-anxiety scale to differentiate anxiety-disordered children from depressed and conduct-disordered children. Strauss et al. (1988) found state-anxiety scores to differentiate anxiety disordered children from psychiatric controls, while trait-anxiety scores did not.

   Studies comparing anxiety disordered children with non-anxious controls on the FSSC-R and RCMAS have not established the discriminant

validity of these two measures. While the evidence for the discriminant power of the STAIC-M is stronger, additional research is needed to determine if any of these measures can discriminate anxiety-disordered children from non-anxiety-disordered controls and thus be clinically useful. Investigation of these issues should begin with studies employing sufficient sample size and *both* psychiatric and normal controls.

In light of the above, the purpose of the present study was to examine the discriminant validity of the FSSC-R, RCMAS, and STAIC-M. DSM-IIIR anxiety disordered boys are compared to boys with ADHD and never-psychiatrically-ill controls on the three measures of anxiety in a multivariate fashion. If the three measures under investigation possess adequate discriminate validity, anxious boys should have significantly higher scores on the measures than both ADHD and never-psychiatrically-ill controls.

METHOD

Subjects

Subjects included a total of 213 boys ranging in age from 5 to 17 years: 105 with an anxiety disorder (Anxiety), 59 with attention-deficit hyperactivity disorder (ADHD), and 49 who were never-psychiatrically-ill (Normal). Boys in the anxiety group were recruited from the Child and Adolescent Anxiety Disorder Clinic at Western Psychiatric Institute and Clinic (WPIC). ADHD boys were recruited from the general outpatient facility at WPIC. Boys in the normal group were recruited from the Pittsburgh community via mailings using the Cole's directory.

Inclusion criteria for the anxiety group were a current DSM-IIIR anxiety disorder with no co-morbid ADHD or depression. For the ADHD group, inclusion criteria were a current DSM-IIIR diagnosis of ADHD with no co-morbid anxiety or depressive disorders. For the never-psychiatrically-ill group, a child had to have no history of any psychiatric disorder or treatment contact to be eligible for inclusion.

At the time of intake, the child and at least one parent were interviewed separately by a clinical psychologist with a modified version of the *Schedule for Affective Disorders and Schizophrenia for School-Age Children* (Present Episode) (K-SADS) (Last, 1986). This version of the K-SADS was modified by Last to include comprehensive sections on all DSM-IIIR anxiety disorders, using rating scales based on DSM-IIIR criteria. In addition, this modified interview schedule covers past as well as current psychopathology.

Interrater diagnostic agreement was obtained by having a second clinician independently review audiotapes of the interviews. Reliability coefficients were computed for 62 of the 213 intake interviews conducted (29%). Kappa coefficients of agreement were .86, 1.0, and .95 for any anxiety disorder, ADHD, and no psychiatric disorder, respectively. The reliabilities for the entire measure are available elsewhere (Last, 1992). In the event of a diagnostic disagreement, the diagnosis given by the live interviewer was used.

With regard to the diagnostic characteristics of the sample, of the 105 boys in the anxiety group, primary anxiety disorders assigned included: separation anxiety disorder=22, social phobia=22, simple phobia=22, overanxious disorder=17, obsessive-compulsive disorder=8, panic disorder with/without agoraphobia=7, avoidant disorder=4, anxiety disorder NOS=2, and post-traumatic stress disorder=1. Forty-one percent of the anxiety group ($n = 43$) had more than one anxiety disorder at intake. All 59 ADHD subjects had a primary diagnosis of ADHD; five had a co-morbid conduct disorder and 12 had a co-morbid oppositional-defiant disorder at intake.

Procedure

Prior to being interviewed with the K-SADS, subjects were asked to complete several questionnaires designed to assess anxiety. These measures included: the Fear Survey Schedule-Revised (Ollendick, 1983), the Children's Manifest Anxiety Scale-Revised (Reynolds & Richmond, 1978), and the Modified State-Trait Anxiety Inventory for Children (STAIC-M) (Fox & Houston, 1983).

The *FSSC-R* is an 80-item questionnaire designed to assess the intensity of fear associated with stimuli that are commonly reported by children to cause anxiety. Ollendick (1983) changed the original 80-item version's 5-point response format to a 3-point response format to "accommodate the developmental and cognitive limitations of young children" (p. 685). Each item is a potentially fearful situation or stimulus to which the respondent rates their level of fearfulness: 1=none, 2=some, and 3=a lot. A total fear score is obtained by summing scores for all items. The total number of intense fears is obtained by totaling the number of items endorsed with a 3. In addition, scores for five factors are obtained: (1) fear of failure and criticism, (2) fear of the unknown, (3) fear of injury and small animals, (4) fear of danger and death, and (5) medical fears.

The *RCMAS* is a 37-item questionnaire designed to assess the presence or absence of various symptoms of chronic, trait anxiety. The respondent indicates "yes" or "no" to such statements as "I am secretly afraid" and "I worry about school." Nine lie-scale items are included to assess the validity of the subject's responses. All "yes" responses, except lie-scale items, are scored in the positive direction for anxiety and are summed to produce a total anxiety score. Three factor scales are obtained: physiological, worry/oversensitivity, and concentration anxiety. Lie scale scores are not presented here.

The original version of the *STAIC* (Spielberger, 1973) included two, 20-item, state-anxiety, and trait-anxiety scales. The state-anxiety scale measures current symptoms of anxiety by asking the respondent to indicate on a 3-point scale the degree to which they are currently experiencing a particular symptom (e.g., I feel 1-not scared, 2-scared, and 3-very scared). The trait-anxiety scale measures chronic symptoms of anxiety by asking the respondent to indicate the frequency with which they experience anxiety symptoms (e.g., I feel troubled: 1-hardly ever, 2-sometimes, and 3-often). Total anxiety scores for the state-anxiety and trait-anxiety scales are obtained by summing scores for the 20 items on each scale.

Fox and Houston (1983) analyzed the original STAIC and found that most items assessed cognitive symptoms of anxiety. So that the scale might equally reflect somatic symptoms, they added seven somatic items to the state-anxiety scale and six somatic items to the trait-anxiety scale. In addition to the "original" state and trait-anxiety scores, the 13 additional somatic items on the STAIC-M allow for the computation of cognitive-state-anxiety, somatic-state-anxiety, cognitive-trait-anxiety, and somatic-trait-anxiety scores. These are obtained by summing the respective cognitive and somatic items on the state and trait-anxiety scales.

Data Analysis

Raw scores on the measures were used in all of the following analyses. While raw scores do vary for age and sex, this sample was made up entirely of boys and age differences were handled with appropriate statistical controls. As the three measures under study all were self-report inventories of childhood anxiety, Pearson correlation coefficients between the FSSC-R, RCMAS, and STAIC-M were computed to determine if the measures were correlated and a multivariate approach to group comparison appropriate. All three measures were significantly correlated with each other at or beyond the $p < .01$ level of significance. The correlations between the FSSC-R

and the RCMAS, State-Anxiety Scale, and Trait-Anxiety Scale (total scores) were $r = .48$, $r = .46$, and $r = .16$, respectively. The correlation between the RCMAS and the State and Trait-Anxiety Scales were $r = .62$ and $r = .36$, respectively. The correlation between the Trait and State-Anxiety Scales was $r = .48$.

A series of 2×2 chi-square analyses with Yate's correction for continuity were performed to test for differences among the groups for race and socioeconomic status (SES), while an analysis of variance with *post hoc* comparisons was performed to test for age-at-intake differences among the three groups. The three groups differed for age-at-intake, race, and socioeconomic status. The anxiety group was significantly older than both the ADHD (12.6 vs. 9.9 years, $p < .0001$) and normal groups (12.6 vs. 10.8 years, $p < .002$). There were more non-Whites in the ADHD group as compared to the anxiety group (40.7% vs. 14.7%, $p < .0001$); the normal group (28.6% non-White) did not differ from the other two groups in racial composition. ADHD subjects were more likely to come from low-SES families (Hollingshead Score of IV or IV) than were either anxiety (59.3% vs. 38.1%, $p < .0001$) or normal subjects (59.3% vs. 28.6%, $p < .003$); the Anxiety and Normal groups did not differ for SES.

To determine if there was a relationship between race and/or SES and scores on the anxiety measures, a two-way multivariate analysis of covariance (MANCOVA) was performed with race and SES as the independent variables, age-at-intake as the covariate, and total anxiety scores on the FSSC-R, RCMAS, STAIC-Trait, and STAIC-State scales as dependent variables. There were no significant effects for race, SES, or for the interaction of race and SES.

To control for the significant intercorrelations among the measures of anxiety and age-at-intake differences among the groups, a series of MANCOVAs were performed. Specifically, three, one-way MANCOVAs were performed with diagnostic grouping (Anxiety vs. ADHD vs. Normal) as the independent variable, ate-at-intake as the covariate, and scores on the FSSC-R, RCMAS, and STAIC-M scales as the dependent variables. The first MANCOVA compared the three groups' total anxiety scores on the FSSC-R, RCMAS, and State and Trait-Anxiety scales. The second compared the groups for the total number of intense fears and the five subscales of the FSSC-R. The third MANCOVA compared the groups on the three subscales of the RCMAS and the two subscales each of the state and trait-anxiety scales. Significant multivariate effects were followed by one-way univariate analyses of variance, or covariance where necessary. Significant univariate analyses were followed with pairwise t-tests using Bonnferoni's correction to control for the inflation of Type-1 error.

RESULTS

Multivariate comparison of the three groups' total anxiety scores on the FSSC-R, RCMAS, and STAIC-M yielded a significant multivariate effect $(F(8,412) = 7.2, p < .0001)$. Total anxiety scores on the RCMAS $(F(2,209) = 21.7, p < .0001)$, trait-anxiety $(F(2,209) = 9.8, p < .001)$, and state-anxiety $(F(2,209) = 6.4, p < .001)$ scales only were significant at the univariate level. Total fear scores on the FSSC-R were not different for the three groups. Pairwise t-test comparisons revealed higher total anxiety scores on the RCMAS, state, and trait-anxiety scales for the anxiety vs. normal group. The ADHD group had higher total anxiety scores than the normal group on the RCMAS and trait-anxiety scales only.

No multivariate effect was observed for the five subscales of the FSSC-R. Alternatively, a significant multivariate effect for the RCMAS and STAIC-M subscales was obtained $(F(14,408) = 8.2, p < .0001)$. All the RCMAS subscales were significant at the univariate level (physiological: $F(2,209) = 29.3, p < .0001$, worry/oversensitivity: $F(2,209) = 11.8, p < .0001$, and concentration anxiety: $F(2,209) = 16.3, p < .0001$), with the anxiety and ADHD groups scoring higher than the normal group. All the STAIC-M subscales, except cognitive-state-anxiety, were significant at the univariate level (somatic-state-anxiety: $F(2,209) = 8.6, p < .0001$, cognitive-trait-anxiety: $F(2,209) = 4.9, p < .008$, and somatic-trait-anxiety: $F(2,209) = 4.7, p < .01$), with the anxiety group scoring higher than the normal group.

DISCUSSION

Our original hypothesis, that anxiety-disordered boys would have significantly higher scores on the three self-report measures of childhood anxiety when compared to ADHD and normal boys, only was partially supported. Boys in the anxiety group did not score significantly higher than the ADHD group on any of the three measures, but did score higher than the normal group on the RCMAS and STAIC-M. The three groups did not differ on any of the scales of the FSSC-R.

The similarity between our three groups on the FSSC-R does not support the discriminative validity of this measure with boys. Consonant with previous research by Last et al. (1989) and Strauss (1988), the FSSC-R did not discriminate the anxious and non-anxious children in our study. However, previous research by Ollendick (1983) found the FSSC-R to discriminate children with school phobia from normals (Ollendick, 1983). To determine if our results for the FSSC-R would hold up for school phobic

Table I. Mean Scores for the FSSC-R, RCMAS, and STAIC-M

	Group					
	Anxiety (n = 105)		ADHD (n = 59)		Normal (n = 49)	
Measure	$\bar{X}$	(SD)	$\bar{X}$	(SD)	$\bar{X}$	(SD)
FSSC-R						
Total fear score[a]	124.3	(23.9)	124.7	(24.1)	120.5	(20.7)
No. of intense fears[a]	11.3	(9.9)	12.3	(11.1)	8.3	(8.1)
Failure/criticism	28.9	(6.7)	29.6	(6.3)	28.5	(5.4)
Fear of the unknown[a]	27.4	(6.4)	26.2	(6.4)	24.9	(4.6)
Injury/small animals[a]	31.8	(6.8)	31.6	(6.9)	31.8	(5.8)
Fear of danger/death[a]	26.1	(6.8)	26.7	(6.5)	25.4	(6.6)
Medical fears[a]	10.2	(2.6)	9.9	(2.5)	9.8	(2.6)
RCMAS						
Total score	11.5[b]	(4.9)	11.3[b]	(5.8)	6.0	(4.0)
Physiological[a]	3.7[b]	(1.6)	4.1[b]	(2.2)	1.8	(1.5)
Worry/oversensitivity	4.9[b]	(2.4)	3.9[c]	(2.7)	2.8	(2.1)
Concentration anxiety	2.9[b]	(1.8)	3.2[b]	(2.0)	1.4	(2.1)
STAIC-state						
Total state anxiety[a]	33.1[b]	(6.3)	30.8	(5.7)	28.6	(5.2)
State-cognitive	12.1	(1.9)	12.4	(2.6)	11.6	(2.2)
State-somatic[a]	29.6[b]	(5.7)	27.5	(4.9)	25.6	(4.7)
STAIC-trait						
Total trait anxiety	35.8[b]	(8.1)	34.1[c]	(7.4)	30.7	(6.3)
Trait-cognitive	15.1[d]	(3.4)	14.3	(3.8)	13.2	(2.7)
Trait-somatic[a]	27.5[e]	(6.5)	26.7	(5.7)	24.3	(4.9)

[a]Indicates age corrected mean.
[b]Vs. normal, $p < .0001$.
[c]Vs. normal, $p < .015$.
[d]Vs. normal, $p < .0003$.
[e]Vs. normal, $p < .003$.

children only, we compared the 33 boys in our anxiety group with simple or social phobias of school with the ADHD and normal controls. There were no significant differences between these three groups.

The observed differences between anxious and normal boys on the RCMAS and STAIC-M (except cognitive-state-anxiety) support their usefulness in discriminating these two groups. These findings are consistent with previous literature that found differences between anxious and normal children on the RCMAS (Bell-Dolan et al., 1990; Last, 1991) and STAIC-M (Bell-Dolan et al. 1990; Strauss et al., 1988).

The absence of differences between the anxiety and ADHD groups on the RCMAS and STAIC-M suggests that these two measures are in-

sufficient for differentiating anxiety disordered boys from boys with other types of psychiatric disorders. The failure of the RCMAS to discriminate anxiety disordered boys from psychiatric controls is consistent with the findings of Hoehn-Saric et al. (1987), Hodges (1990), Mattison and Bagnato (1987), and Strauss et al. (1988). Our findings contrast with previous studies that found anxiety disordered children to score higher than psychiatric controls on the RCMAS-worry/oversensitivity scale (Mattison, Bagnato, & Brubaker, 1988), and the state (Strauss et al., 1988) and trait-anxiety (Hodges, 1990) scales. However, Mattison et al. (1988) included children with co-morbid depression and ADHD in their anxiety group. Hodges' (1990) comparison groups were both in-patient samples. The samples in Strauss et al.'s (1988) study, as well as Hodges' (1990) and Mattison et al.'s (1988), included girls and boys. Co-morbid depression or ADHD, in-patient status, and being female may be related to increased reporting of anxiety, as compared to the anxiety disordered only boys in our sample, and thus account for the differences found between anxiety-disordered children and psychiatric controls in those studies.

An alternate hypothesis for the lack of differences between our anxiety and ADHD groups is that there is a greater similarly between anxiety- and ADHD-disordered children than has been previously described in the literature. Recently, children with ADHD were found to develop new anxiety disorders at a comparable rate to a sample of DSM-IIIR anxiety-disordered children (Last, Perrin, Hersen, & Kazdin, 1992), and to have high rates of co-morbid anxiety (Anderson, Williams, McGee, & Silva, 1987; McClellan, Rubert, Reichler, & Sylvester, 1990) and anxiety in their first-degree relatives (Biederman, Faraone, Keenan, Knee, & Tsuang, 1990; Last, Hersen, Kazdin, Orvaschel, & Perrin, 1991). McClellan et al. (1990) found an increased rate of ADHD in the offspring of panic disordered adults vs. depressed and normal adults. Also, Reeves, Werry, Elkind, and Zametkin (1987) found anxious and ADHD children to be similar with regard to neurodevelopment, family background, and parental factors.

It is possible that ADHD and anxious boys generally are too similar for differences to be detected by the RCMAS, FSSC-R, and STAIC-M. Boys with ADHD experience high rates of aversive experiences from their parents and peers that may result in symptoms of anxiety. Further, parents and teachers who have difficulty controlling a child with ADHD may model anxious behavior and reinforce anxious behaviors in the child. While it is highly unlikely that anxious boys will develop symptoms of ADHD over time, the self-report of boys with ADHD on measures of anxiety may increasingly come to resemble those of anxiety-disordered children due their repeated negative experiences with parents, teachers, and peers.

Given the possible relationship between anxiety and ADHD, the lack of observed differences found between anxious and ADHD children may not hold true for other types of psychiatric control groups that may be less related diagnostically, However, the most parsimonious explanation of four findings is that the measures have poor discriminative validity for clinically anxious boys.

We wish to point out the limitations of our investigation. First, all the subjects in our sample were males and thus our findings are not generalizable to females. It has been well documented in the literature that girls tend to report more symptoms of anxiety than boys on self-report measures of anxiety. It is possible that the lack of differences between the anxiety and ADHD groups reflects the tendency of boys to under-report internalized symptoms of anxiety as compared to externalized symptoms that are readily observable by parents, teachers, and peers. This would appear to be particularly true with regard to self-reported fears, as anxiety disordered boys were similar to normals on the FSSC-R.

Second, it is arguable that we may erroneously reject the validity of these measures by holding diagnostic interviews as the yardstick by which we measure anxiety. We could as easily have used cut-off scores on the three measures to identify anxious and non-anxious groups and evaluated the validity of the structured diagnostic interview. However, we have attempted to show that these measures have limited usefulness in discriminating clinically anxious children from non-anxious children defined by DSM-IIIR criteria, a purpose for which they have often been used.

Despite these limitations, the results of this study point out the need for additional research into the clinical utility of these measures and the importance of multi-method assessment in the identification of anxiety-disordered children. Future research should address the clinical utility of these measures using female as well as male children and incorporating non-ADHD psychiatric controls.

ACKNOWLEDGMENTS

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