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DISCRIMINANT VALIDITY OF SELF-REPORTED ANXIETY AND DEPRESSION IN CHILDREN: GENERALIZABILITY TO CLINIC-REFERRED AND ETHNICALLY DIVERSE POPULATIONS

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In the present study, we investigated the relation of childhood anxiety and depression with 240 children (56% clinical referrals, 44% nonclinical referrals) ages 8 to 14 years. Participants were administered the State-Trait Anxiety Inventory for Children (STAIC) and the Children's Depression Inventory (CDI), two commonly used self-report measures of childhood anxiety and depression. The principal focus of this study was to examine the discriminant validity of these measures at the level of individual items through factor analysis. Although high correlations were found between overall scores on the CDI and STAIC, factor analysis yielded distinct factors of anxiety and depression. Thus, with the inclusion of clinic-referred and ethnically diverse groups, the present study provided support for the generalizability of findings of similar research with non-clinic-referred, primarily-Caucasian samples.

Keywords: anxiety, depression, validity, generalizability, school-age children

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Theoretically, anxiety is associated with "fear," and is characterized by "worry," "dread," and "apprehension"; depression is associated with "sadness" and includes features of "hopelessness," "gloom," and "sorrow" (Watson, Weber, et al., 1995). Despite the distinctness of their defining characteristics, anxiety and depression often have not been statistically differentiable through the use of

of clinic-referred and ethnically diverse samples in the present study, we examined the generalizability of findings from these earlier studies.

Method

Participants

Participants included 240 children (37% male, 63% female; 66% African American, 30% Caucasian; mean Hollingshead [1975] socioeconomic status [SES] = 3.6) between the ages of 8 and 14 years (M = 10.8 years, SD = 1.8 years). Archival data were drawn from four groups: one community group (School; n = 60, recruited from the Philadelphia school district), one non-clinic-referred group of sexually abused children (Abuse; n = 46, recruited from the Philadelphia Department of Human Services), and two clinic-referred groups (Phobic; n = 78, recruited from the Medical University of South Carolina; and Outpatient; n = 56, obtained from the Outpatient Department in the Division of Child and Adolescent Psychiatry at the Medical College of Pennsylvania). There were no between-group differences found for age, gender, and SES. The four groups differed only on the variable of ethnicity, χ^2 = 71.6, $p < .001$, reflecting the different geographic locations from which they were recruited. Specifically, the Outpatient, Abuse, and School groups were primarily African American (83%), and the Phobic group consisted mainly of Caucasian participants (64%).

Measures

CDI (Kovacs, 1992)

The CDI consists of 27 items designed to measure a variety of depressive symptoms (e.g., loss of appetite, sleep disturbance). Three statements comprise each item, ranging from symptoms endorsed mainly in non-clinic-referred populations to statements reflecting severe and clinically significant symptom descriptions. The CDI has good psychometric properties that have been extensively evaluated in the literature (see Kovacs, 1992; Saylor, Finch, Spirito, & Bennett, 1984).

STAIC (Spielberger, 1973)

Two scales–"State" and "Trait" anxiety–comprised of 20 face-valid items apiece, make up the STAIC. "State" anxiety addresses the *current* feelings of the child, and "trait" anxiety assesses *typical* anxiety-related feelings. Because the CDI is linked more closely with "trait" anxiety in that scores on these scales reflect typical (rather than current) feelings, the "state" scale was excluded from analyses. Good test-retest reliability and internal consistency have been reported for the STAIC (James, Reynolds, & Dunbar, 1994).

Procedure

Analyses for this study were performed with archival data derived from two recently conducted investigations. Children in the Abuse, Outpatient, and School groups participated in a 2-year longitudinal investigation of childhood sexual abuse, with Outpatient and School children serving as non-abused comparisons (principal investigator for this study was S. V. M.). For participants in these groups, structured diagnostic interviews were administered, and a series of self- and parent-report measures were completed in addition to the CDI and STAIC (for additional information, refer to McLeer et al., 1998). Each of the children in the Phobic group (principal investigator for this study was D. C. B.) received a diagnosis of social phobia. Children in this group completed a structured diagnostic interview in addition to several rating-scale instruments that included the CDI and STAIC.

Results

Diagnostic data are presented in Table 1. Overall, 60.4% of the sample received a psychiatric diagnosis according to criteria delineated in the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 1987, 1994). This included 50% (n = 120) with anxiety-depression spectrum diagnoses: 8 with depression-related diagnoses (e.g., dysthymia), 106 with anxiety-related disorders (e.g., social phobia), and 6 with comorbid anxiety-depression diagnoses; 17% were diagnosed with a disruptive behavior disorder (e.g., conduct disorder), including 10% who did not have a comorbid anxiety-depression spectrum diagnosis.

Factor Analysis

A varimax-rotated principal-components factor analysis was performed with CDI and STAIC-Trait items. Although the initial solution revealed 13 eigenvalues of 1.0 or greater, an examination of factor scree plots indicated that a four-factor solution would be most appropriate for the analysis, as indicated by a change in slope for plotted eigenvalues (see Tabachnick & Fidell, 1996, p. 672). Eigenvalues of 10.6, 2.7, 2.3, and 1.6 were identified for Factors I, II, III, and IV, respectively. This solution accounted for 37% of the variance, slightly higher than the 31% reported by Boyd and Gullone (1997).

Factor analysis results are presented in Table 3 (item numbers listed in the table correspond with item numbers on the CDI and STAIC). Eighteen of the 20 STAIC-Trait anxiety items loaded onto Factor I, which did not include any CDI items. The remaining three factors were comprised of the 27 CDI items in addition to the two remaining Trait items. Items loading on Factor II tend to reflect self-hate and interpersonal concerns. Factor III consisted exclusively of CDI items that appear to reflect oppositional behavior, self-blame, and sadness. Factor IV included several CDI items and one Trait anxiety item indicative of sleep difficulties, fatigue, and academic concerns. When examined separately by gender and across groups, highly similar factor structures emerged; however, these findings should be interpreted with caution due to the small sample size and resulting lack of statistical power.

Table 3
Four-Factor Varimax-Rotated Factor Loadings for the CDI and STAIC-Trait Items

	Factor Loadings				
Item	I	II	III	IV	h^2
Factor I					
T17. Events	**.69**	.00	.18	.04	.50
T14. Afraid	**.64**	.23	.18	.09	.51
T01. Mistakes	**.62**	.04	.15	−.03	.41
T10. Thoughts	**.60**	.19	.06	.03	.40
T12. Decisions	**.59**	.07	.03	.33	.47
T20. Self-conscious	**.57**	.21	.07	−.02	.38
T09. Feelings	**.56**	.27	.20	.14	.44
T02. Tearful	**.55**	.11	.19	.14	.37
T06. Worry	**.54**	.09	.31	−.01	.40
T05. Problems	**.54**	.32	.10	.03	.40
T04. Indecision	**.51**	.09	.08	.26	.35
T03. Unhappiness	**.50**	.28	.13	.03	.35
T07. Upset at home	**.50**	.15	.29	.12	.37
T19. Funny feelings	**.47**	.12	−.11	.38	.39
T11. School	**.47**	.08	.17	.17	.29
T13. Rapid heartbeat	**.47**	−.01	−.03	.32	.32
T16. Sweaty hands	**.44**	.05	−.14	.17	.25
T08. Shyness	**.41**	.24	−.32	−.08	.34

continued

Discussion

In the present investigation, we examined the relation between childhood trait anxiety and depression as measured by the STAIC and CDI. Factor analysis findings were consistent with results reported by Boyd and Gullone (1997) and Crowley and Emerson (1996), as symptoms associated with anxiety and depression loaded on distinct factors. Several similarities also may be identified between the present findings and results of other studies. Specifically, the correlation between CDI and STAIC scores (.63) clearly was within the range (.45 to .75) of correlations between scores of self-reported anxiety and depression presented elsewhere (Clark & Watson, 1991; Watson, Weber, et al., 1995). Additionally, the structure of the three factors upon which CDI items predominantly loaded (II, III, and IV) was consistent with the structures of the three CDI factors reported by Carey, Faulstich, Gresham, Ruggiero, and Enyart (1987) with a sample of 306 children and adolescents (153 clinical, 153 nonclinical).

Despite high correlations between overall scores of anxiety and depression, items from the two measures administered in this study tended to load onto distinct factors. There exist a number of potential explanations for these findings that we were unable to assess with the present methodology. For instance, depression and anxiety may represent two fairly distinct, but related, components of a single construct of "negative affectivity." Additionally, among the many symptoms that comprise the constructs of anxiety and depression, significant similarities occur on several levels (Brady & Kendall, 1992), including overt-motor (e.g., inattention to tasks), cognitive (e.g., fear of future outcomes), and physiological (e.g., headaches). However, it remains unclear why similar factor loadings were not identified for CDI and STAIC Trait anxiety symptoms with similar content (e.g., Trait Item 4, "Indecision" and CDI Item 13, "Indecisiveness" which assess difficulties with decision making).

The present findings appear to have important implications for research and clinical practice. For instance, high correlation coefficients found with CDI and STAIC scores imply that these measures should not be used to facilitate differential diagnosis. Similarly, these correlations imply that scores derived with these measures are limited in the extent to which they may be interpreted. To heighten interpretability of information collected with these and similar measures, mental health professionals may wish to employ more commonly a level of analysis that utilizes individual symptom endorsements and subscale scores.

It should be noted that our sample size of 240 for factor analysis was marginal (approximately five participants for each assessment item), and that analyses with a larger sample size would have been more desirable. An additional limitation of this study was the low number of children with diagnoses related to depression (n = 14) relative to the number of participants with anxiety-related diagnoses (n = 112). Importantly, however, relatively few participants reported an absence of depressive symptomatology, and considerable variability in the number of depressive symptoms endorsed on the CDI was evident, particularly among participants in the abuse and clinical groups. The primary strength of this study involved the populations from which these groups were derived. Previous research involving factor-analyzed self-reported anxiety and depression with children included participants recruited from nonclinical, primarily Caucasian populations; thus, the generalizability of findings was uncertain (Boyd & Gullone, 1997). With the inclusion of clinic-referred and ethnically diverse samples, the present study provides support for the generalizability of findings from previous studies examining the discriminant validity of anxiety and depression in children.

The CDI and STAIC-Trait measures are restricted to negatively worded items, and the STAIC includes very few items that assess anxiety-related physiological arousal, thus precluding an examination of the

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