

Concurrent Validity of the Eyberg Child Behavior Inventory

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Examined the concurrent validity of the Problem and Intensity scales of the Eyberg Child Behavior Inventory (ECBI), using the Child Behavior Checklist (CBCL) as the criterion measure. Subjects were 159 children ages 4 to 16 referred for psychological evaluation between 1985 and 1988 for whom both the ECBI and CBCL had been completed. ECBI scales were correlated with both the Internalizing and Externalizing scales of the CBCL but were significantly more highly correlated with the Externalizing scale. Results supported the validity of the ECBI as a concise measure of childhood conduct-problem behaviors.

The Eyberg Child Behavior Inventory (ECBI) is a 36-item parent rating scale of conduct-problem behaviors for children between the ages of 2 and 17. Parents rate how often each behavior occurs on a 7-point frequency-of-occurrence scale ranging from *never* (1) to *always* (7), and the item ratings are summed to yield the Intensity score. Parents also indicate whether the behavior is currently a problem on a *yes-no* problem-identification scale, yielding the Problem score, which is the sum of *yes* responses. The ECBI has been used in studies describing the behavioral characteristics of aggressive children (e.g., Dumas, 1986), encopretic children (Friman, Matthews, Finney, Leibowitz, & Christophersen, 1988), children of battered wives (Hughes & Barad, 1983), children who have been abused and neglected (Aragona & Eyberg, 1981; Wolfe, Sandler, & Kaufman, 1981), and children suffering from chronic illness (Pinzon, Eyberg, & Graham-Pole, 1989).

Factor analyses of the ECBI for both children and adolescents indicate that it is a unidimensional measure of conduct-problem behaviors (Eyberg & Robinson, 1983; Robinson, Eyberg, & Ross, 1980). Evidence for discriminant validity of both ECBI scales has been demonstrated by significant differences between conduct-problem children and other clinic-referred children and between conduct-problem children and normal children (Eyberg & Robinson, 1983; Eyberg & Ross, 1978). Normative data have

shown consistency in ECBI scores across age and socioeconomic levels (Eyberg & Robinson, 1983), and ECBI scores have been found independent of social desirability factors (Robinson & Anderson, 1983). Treatment outcome studies have shown the ECBI to be a sensitive measure of change in conduct-problem behaviors of children (Eyberg & Robinson, 1982; Webster-Stratton, 1982, 1984; Wolfe et al., 1981). ECBI scores have also been found to relate significantly to direct observational measures of parent-child interactions, activity level, and temperament (Robinson & Eyberg, 1981; Webster-Stratton & Eyberg, 1982), providing evidence of convergent validity. Recent data by Webster-Stratton (1988) suggest convergence of ECBI scores with measures of maternal distress as well.

Consistent with the multiple-gating approach to assessment (Reid, Baldwin, Patterson, & Dishion, 1988), the ECBI seems to be appropriate as a brief screening instrument for children referred for treatment of conduct problems. To establish further the utility of the ECBI as a single indicator with these children, it would be useful to determine its concurrent validity with another well-established parent rating scale measuring the same construct. The Child Behavior Checklist (CBCL; Achenbach & Edelbrock, 1983), a widely used instrument in clinical research, assesses many symptom categories and provides a broadband scale of Externalizing behavior as well as a scale of Internalizing behavior problems. The two CBCL scales permit further evaluation of the precision of the ECBI in discriminating conduct-product children. The purpose of our study is to establish the concurrent validity of the ECBI using the CBCL as the criterion measure.

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Method

Subjects

The sample consisted of 159 children referred for evaluation at a university psychology clinic between 1985 and 1988. All 4- to 16-year-olds for whom an ECBI and a CBCL had been completed by the mother or maternal guardian were included. (Parents of all children seen in the clinic sign a consent allowing data from their records to be used for research purposes.) Overall, 65% of the children were male. In racial composition, 87% were White, 11% Black, and 2% Other. Two thirds of the sample came from two-parent households. Most children (85%) had two or fewer siblings. Their average age was 8.3 years ($SD = 2.9$), with 15% ($n = 24$) between 4 and 5 years, 67% ($n = 107$) between 6 and 11 years, and 18% ($n = 28$) between 12 and 16 years of age. Data on family socioeconomic status (SES) were available for 97 (61%) of the children. Their families were predominantly middle to lower class (82.5%) but included all five levels of social class as measured by Hollingshead and Redlich's (1958) Two-Factor Index of Social Position (Class I = 8.2%, Class II = 9.3%, Class III = 24.8%, Class IV = 28.8%, Class V = 28.9%).

Criterion Measure

The CBCL is a comprehensive instrument designed to assess a wide variety of specific behaviors in children. It consists of 118 behavior-problem items rated by the parent on a 3-point scale with points labeled *not true* (0), *somewhat or sometimes true* (1), and *very true or often true* (2). Normative data, stratified for three age groups (4 to 5, 6 to 11, and 12 to 16 years) and for sex, have been provided for 1,300 community, nonclinic-referred children and 2,300 mental-health-clinic-referred children. The behavior problem items have been factor-analyzed into subscales that are given descriptive labels such as Schizoid, Depressed, Somatic Complaints, Hyperactive, and Aggressive. The checklist also yields two second-order factor scores of the child's problems: The Externalizing factor represents undercontrolled or conduct-problem behaviors, and the Internalizing factor represents overcontrolled or more anxious-withdrawn behaviors. The authors have reported 1-week retest stability of .95 and have provided evidence that this instrument can discriminate effectively between clinic-referred and normal children (Achenbach & Edelbrock, 1983).

Analyses

Scores used for all analyses were the raw scores of the ECBI Problem and Intensity scales and the T scores of the CBCL Internalizing and Externalizing scales. Tests for normality indicated that the data were not normally distributed for any of these four scales in our sample. Therefore, nonparametric statistics were used to compute correlations (Spearman correlation coefficients) and to test the equality of sample means (Wilcoxon two-sample test). William's modification of Hotelling's T statistic was used to test the equality of two correlations with one index in common (Steiger, 1980). For some of the analyses, the sample was divided into preschool (ages 4 to 5), elementary (ages 6 to 11), and adolescent (ages 12 to 16) groups based on the CBCL age categories.

Results

Neither age nor number of siblings was found to correlate significantly with scores on the ECBI or with T scores on the CBCL. However, Problem scores on the ECBI were significantly higher for children in single-parent homes than for children in two-parent homes ($z = 3.08, p < .002$). No other significant differences between scores for children in single-parent versus two-parent households were found. For the subsample of subjects ($n = 97$) for whom SES data were available, SES was not significantly correlated with either the Problem or Intensity scores on the ECBI. However, SES was significantly correlated with Internalizing T scores ($r = .26, p < .01$) and Externalizing T scores ($r = .21, p < .04$), such that lower SES was correlated with higher behavior-problem scores.

Table 1 provides correlations between ECBI scores and CBCL scores for the overall sample and within each age group. All correlations were statistically significant. The high correlations between the ECBI scores and the Externalizing T scores support the concurrent validity of the Intensity and Problem scores of the ECBI. The ECBI scores were also significantly correlated with the Internalizing scale of the CBCL. To investigate this finding further, differences in the magnitude of the correlations between measures were examined (see Table 1). Correlations between ECBI scores and Externalizing T scores were significantly higher than correlations between ECBI scores and Internalizing T scores for the overall sample. Within age groups, Table 1 shows that, for elementary school age children, discriminability between CBCL factors was maintained for

Table 1. *Correlations Between ECBI and CBCL Scores and Tests for Differences in Correlation Magnitudes (Internalizing vs. Externalizing)*

Age Group	n	CBCL Score		T ^a
		Internalizing	Externalizing	
ECBI Problem Score				
Preschool	24	.81***	.85***	-0.63
Elementary	107	.41***	.65***	-3.49*
Adolescent	28	.51*	.68***	-1.42
Total	159	.48***	.67***	-3.74*
ECBI Intensity Score				
Preschool	24	.72***	.86***	-1.70
Elementary	107	.34**	.73***	-6.44*
Adolescent	28	.48*	.72***	-2.19
Total	159	.41***	.75***	-6.86*

Note: For all analyses, alpha was set at $p < .01$ to reduce Type I errors.

^aWilliam's modification of Hotelling's *T* statistic (see Steiger, 1980).

* $p < .01$. ** $p < .001$. *** $p < .0001$.

both ECBI scales. Within the preschool and adolescent groups, however, there were no significant differences between the correlations of ECBI scores with CBCL scores.

Discussion

The concurrent validity of the ECBI scales with another well-established parent-report scale was demonstrated by their high correlations with the CBCL Externalizing scale for children between the ages of 4 and 16 years. Within the overall child sample, significant differences between the correlations with the Internalizing and Externalizing scales of the CBCL provide a preliminary suggestion of discriminability for the ECBI scales as well. When examined by age group, similar findings were obtained for elementary school age children, but correlations within the preschool and adolescent age groups were not significantly different. In view of the magnitude of the correlations obtained, it is possible that the small sample sizes of the preschool and adolescent groups restricted the power of the statistical tests, accounting for the absence of significant differences. Alternatively, the ECBI may discriminate less well between Internalizing and Externalizing behaviors at the extremes of the age distribution, at least in relation to another parent-report scale. Further study of the discriminability of the ECBI, partic-

ularly within these two age groups, is needed to clarify these findings.

The correlations between the ECBI scales and both CBCL scales are consistent with the significant correlations between the *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed.; American Psychiatric Association, 1980) diagnosis of oppositional disorder and the two CBCL scales (Edelbrock & Costello, 1988). It has also been found that parents of depressed children rate them high in both Internalizing and Externalizing behaviors on the CBCL (Romano & Nelson, 1988). Taken together, these findings suggest that ECBI scores may be reflecting the co-occurrence of Internalizing and conduct-problem behaviors in some children.

Neither Problem nor Intensity scores of the ECBI were related to age, sex, or family SES. However, the ECBI Problem score was higher for children in single-parent homes in this study. This scale differs from the Intensity scale and the two CBCL scales, which essentially address frequency of behavior problems, in that the Problem scale asks if parents view the behaviors as problematic for them and thus it may be measuring parental distress. Higher maternal distress in single-parent homes has been discussed by Hetherington, Stanley-Hagan, and Anderson (1989).

Overall, the results of this study further support the validity of the ECBI as a measure of conduct-problem behaviors. Its format permits rapid administration and hand scoring, making it practical for clinical purposes, and its provision of a single set of items across the full age-range enables longitudinal assessment using a single measure. The Problem scale permits parent report of the personal impact of the behaviors, and the wide response range of problem frequency on the Intensity scale provides a sensitive measure of treatment change.

The ECBI appears to be a parent-report instrument well suited for the initial, low-cost level of multiple-gating assessment, and its concurrent validity with the CBCL supports this use. As noted by Anastasi (1988), "Such tests provide a simpler, quicker, or less expensive substitute for the criterion data" (p. 146). Additionally, the psychometric characteristics of the ECBI support its use in research with conduct-problem children.

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