# Restandardization of the Eyberg Child Behavior Inventory

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## Abstract

Restandardized the ECBI using a current, demographically representative sample of 798 children and adolescents balanced for gender and age within groups from 2 to 16 years. Strong internal consistency coefficients were replicated in the total sample and demonstrated within gender, age, and race subgroups. No significant differences in scores were found between mother and father raters, but among the rated children, significant age by gender effects were obtained for scores on both the Intensity and Problems Scales of the ECBI. We were not able to replicate a recent report of multiple, interpretable factors on the Intensity Scale using four methods of factor analysis; we suggest that the total scale scores are the most appropriate indices of conduct disordered behavior. Significant differences between parent-identified behavior problem and non-behavior problem subgroups provided further support for the discriminant validity and treatment sensitivity of the ECBI. The normative data indicate the need to modify slightly the previously established cutoff scores for treatment selection to avoid over-inclusion errors. Recommended cutoff scores of 132 for the Intensity Scale and 15 for the Problem Scale require validation in additional known groups of clinical and non-clinical children and adolescents.

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Disruptive behaviors in childhood and adolescence are divided into three major diagnostic categories in the Diagnostic and Statistical Manual IV (DSM-IV; American Psychiatric Association, 1994): Attention Deficit Hyperactivity Disorder (ADHD); Oppositional Defiant Disorder (ODD); and Conduct Disorder (CD). The behaviors that comprise these disorders are highly intercorrelated (Arnold, Barneby, & Smeltzer, 1981; Reeves, Werry, Elkind, & Zametkin, 1987) and occur commonly in the general population.

The prevalence rate for these disorders together is estimated at 12% of children in the general population (Dumas, 1992), and they constitute the most common reason for referral of young children to mental health services (Schuhmann, Durning, Eyberg, & Boggs, 1996). Increasing evidence suggests that untreated, disruptive behavior persists and is associated with impaired functioning later in life (Campbell & Ewing, 1990; Lahey et al., 1995). It is also well established that "normal" children typically display a number of disruptive behaviors (LaPouse & Monk, 1964; Schuhmann et al., 1996). The variety and intensity of disruptive behaviors, rather than merely their presence, are the best predictors of later outcome (Richman, Stevenson, & Graham, 1982).

Parents are an undeniably important source of information in the assessment of disruptive behaviors in children and adolescents (Tarullo, Richardson, Radke-Yarrow, & Martinez, 1995). They see the child in diverse situations and engage the child in a myriad of interactions. They also typically determine the child's referral for treatment. Parent reports of a child's behavior are most conveniently quantified by using rating scale measures. Rating scales have inherent limitations in that they are based on subjective perceptions and may be biased by such factors as halo effects, recency effects, or idiosyncratic interpretations of scale items or anchor points. Careful analysis of the psychometric properties of a rating scale is necessary to determine the confidence that can be placed in a given use of the scale.

Yet, parent rating scale measures have become indispensable in the evaluation of child and adolescent disruptive behavior as they offer several advantages to the assessment process. First, parent rating scales provide a description of a wide range of common behavior problems which collectively may suggest diagnosis and signify whether psychological treatment is indicated. To assess efficiently the changes in behaviors that determine the course and effectiveness of treatment, rating scales are convenient for repeated administration (Eyberg, 1992). Finally, parent rating scales provide data that are readily quantifiable for determining developmental deviance of problem behavior by comparison with normative data.

The Eyberg Child Behavior Inventory (ECBI; Eyberg & Pincus, 1999) is a widely used parent rating scale designed to measure conduct-problem behavior in children between the ages of 2 and 16 years. The ECBI was originally standardized in 1980 (children) and 1983 (adolescents) using youngsters drawn from the pediatric outpatient clinic of a large urban medical school in the Northwest U.S. (Eyberg & Robinson, 1983; Robinson, Eyberg, & Ross, 1980). The youngsters were from primarily lower and lower-middle income Caucasian families. The reliability and stability, convergent, discriminant and discriminative validity, and sensitivity to changes in behavior following treatment were established in these and subsequent studies from several laboratories (see Eyberg, 1992, for a review).

Subsequently, Burns and colleagues reported additional standardization data from two samples, one of 2- through 17-year-old children from primarily middle- to upper-middle income Caucasian families seen in pediatric clinics in

four Northwestern states (Burns, Patterson, Nussbaum, & Parker, 1991) and one of 6- through 18-year-old children from a metropolitan city school district (Burns & Patterson, 1990). In both studies, high coefficients of reliability and validity were replicated. For normative purposes, however, the studies had certain limitations.

First, in the pediatric clinic sample (Burns et al., 1991), nearly half of the children were in the 2 to 5 year age range, resulting in an unbalanced sample from which the normative data were drawn (mean age = 6.9 years). Yet, Burns et al. (1991) also included 17-year-olds, which is outside the age range for which the ECBI was originally designed. Similarly, children ranged from 6 to 18 years of age in the school sample (Burns & Patterson, 1990). Further, mean scores were not reported for individual age levels but instead for age groupings that were not consistent across studies.

Second, in both samples, the means for the total sample and age groupings had limited utility due to exclusions associated with behavior problem base rates. In the pediatric sample (Burns et al., 1991), for example, children who had been referred for evaluation of behavior problems and children currently in treatment at the clinic or elsewhere for either learning disabilities or behavior problems were excluded. Children with any history of treatment for learning disabilities or behavior problems were also excluded from the school sample (Burns & Patterson, 1990). These excluded children are most apt to fall in the top half of the normal curve of behavior problems. Therefore, comparing any particular sample of children to such a standardization sample could tend to exaggerate differences and result in identifying spuriously higher frequencies of disruptive behaviors in the sample of interest (Drotar, Perrin, & Stein, 1985).

The purpose of the current study was to update the original ECBI normative data with a new standardization sample representative of the general child and adolescent population in the southeastern United States, and to evaluate the psychometric characteristics of the ECBI in this population.

# Method

### *Participants*

Participants were drawn from six pediatric settings in Florida. The total sample consisted of 798 children between the ages of 2 and 16 years, with all 15 age groups equally and adequately represented. The sample was 52% male and 48% female; 74% Caucasian, 19% African American, 3% Hispanic, 1% Asian, 1% Native American, and 2% of other or mixed ethnicity. The distribution of ethnicity corresponds closely to recent U.S. Census data (U.S. Bureau of the Census, 1990). Children resided with both natural parents (53%), with mother and stepfather (14%), with father and stepmother (1%), in single-parent homes headed by mother (26%), in single-parent homes headed by father (1%), and with foster parents or relatives (5%). Although the original standardization sample had no difference in ECBI scores between youngsters with and without chronic illnesses (Robinson et al., 1980), children with chronic illnesses were not included in this study to avoid overrepresentation due to recruitment from pediatric clinics and were excluded for a separate study.

The socioeconomic status of the families according to the Hollingshead (1975) Four-Factor Index of Social Status was evenly distributed, with 21% in the lowest group, 25% in Group II, 22% in Group III, 22% in Group IV, and 10% in the highest group. Of the families that reported their county of residence ($\underline{n}$ = 780), 61% lived in an urban county and 39% lived in a rural county.

According to background information provided by parents on the demographic data sheet, the following five subgroups were identified for validity analyses: (a) Three percent ($\underline{n}$ = 22) of the children had been referred at some time in the past for treatment of learning disabilities but had never obtained such treatment (LDR-NT). (b) Nine percent ($\underline{n}$ = 70) of the children had received treatment in the past or were currently receiving treatment for learning disabilities (LDR-T). (c) Four percent ($\underline{n}$ = 27) of the children had been referred for treatment of behavior problems at some time in the past but had never received

receiving such treatment (BPR-T). (e) The remaining 665 children formed the non-behavior problem group for purposes of the validity analyses. Note that the two learning disabilities groups were not mutually exclusive from the two behavior problem groups. That is, a child could be included in a learning disability group and a behavior problem group.

***Procedure***

A research assistant or receptionist gave a packet containing a cover letter explaining the study, an informed consent form, a demographic sheet, an ECBI, and an envelope in which to place the completed ECBI, to parents of children visiting the target clinics. The parents were asked to complete these materials in the waiting room and to return them to the research assistant or receptionist, who also recorded the unaccepted packets to track participation rates. Approximately 7% of parents declined participation in the study, and approximately 6% of those parents who did participate did not complete either the demographic questionnaire or the ECBI itself. Packets were completed by either the child's mother (84%), father (11%), or other adult caretaker (5%). Data collection was structured to ensure anonymity, and no identifying information was requested on the materials.

The *Eyberg Child Behavior Inventory* (ECBI; Eyberg & Pincus, 1999) is a 36-item parent-report measure of conduct-problem behavior in children between the ages of 2 and 16 years. The 36 items are rated on two scales: (a) The Intensity Scale asks for a frequency of occurrence rating for each behavior (item), ranging from “Never” (1) to “Always” (7), and these frequency ratings are summed to yield a total intensity score that can range from 36 to 252. (b) The Problem Scale asks the parent to identify the problematic behaviors by circling “Yes” or “No” in response to the question, “Is this a problem for you?” The sum of the circled yeses, which can range from 0 to 36, yields the problem score. High coefficients of reliability and construct validity have been previously established for children and adolescents.

Each week the collected forms were sorted by an undergraduate assistant, who was instructed to exclude forms on which a chronic illness was indicated and to further sort the forms by child age. Once an age category had 60 forms, the assistant placed further forms from that age group into a discard file. Data collection continued until each age level contained at least 50 forms.

# Results

***Item Analyses***

Parents' frequency ratings for each behavior were positively skewed for all but one item (#10, *gets angry when doesn’t get own way*), which was normally distributed. Across all 36 items, skewness ranged from -.16 to 4.02 and kurtosis ranged from -.03 to 18.3. These item distributions were expected given that the sample is a normative one and positively skewed distributions are reflective of lower frequency ratings for problem behaviors.

Mean frequency ratings for each item are shown in Table 1. These ratings indicate that, on average, the behaviors rated by the ECBI occur "seldom" or "sometimes." Each item was endorsed as a problem by 6% to 37% of parents. The behavior most frequently labeled as a problem was "gets angry when doesn't get own way," (37%) and the item least frequently endorsed as a problem was "steals" (6%).

***Scale Analyses***

The Intensity Scale scores ranged from a minimum score of 36 to a high of 232, with a mean of 96.6, a standard deviation of 35.2, and a standard error of the mean of 1.2. The Problem Scale scores ranged from 0 to 36, with a mean of 7.1, a standard deviation of 7.7, and a standard error of the mean of 0.27. The distribution for the Intensity score was positively skewed (skewness = 0.74, kurtosis = 0.52). Table 2 presents the normative data for ECBI scores at each age level. As shown in the table, gender distribution was generally equivalent across ages.

Welch tests were conducted to compare the ECBI restandardization scores to those from the original standardization samples. A *z* critical value was used because the sample sizes are large and the asymptotic distribution of the Welch statistic is normal. Results indicated a significant difference for the intensity scores only. The mean intensity score from the present sample of children and adolescents was significantly higher than that obtained with adolescents (Eyberg & Robinson, 1983; $z = 2.5$, $p < .05$) and significantly lower than that found with children (Robinson et al., 1980; $z = 3.6$, $p < .05$). When compared to the Burns and Patterson (1990) sample, the current Intensity Scale scores were significantly higher, $z = 3.41$, $p < .05$, and compared to the Burns et al. (1991) sample, the current intensity scores were significantly lower, $z = 2.01$, $p < .05$. There were no significant differences obtained for the Problem scale score.

The Intensity and Problem Scales were strongly correlated with each other, $r(796) = .75$, $p < .001$, in this diverse normative sample. This finding is consistent with the correlation coefficients obtained in the original standardization data for children ($r = .75$; Robinson et al., 1980). Correlations vary in clinical samples, as expected (see Eyberg, 1992).

***Internal Consistency***

Corrected item-to-total correlations between the item intensity ratings and the Intensity Scale score ranged from .26 for "wets the bed" to .75 for "acts defiant when told to do something" and "refuses to obey until threatened with punishment." Only one item had a correlation coefficient below .30. Item-to-total correlations for the problem ratings ranged from .30 for "wets the bed" to .67 for "acts defiant when told to do something." The mean item-to-total correlation was $r = .55$ ($SD = 0.12$) on the Intensity Scale and $r = .51$ ($SD = 0.10$) on the Problem Scale.

For the entire sample, Cronbach's alpha was .95 for the Intensity Scale and .93 for the Problem Scale. Internal consistency coefficients for demographic subgroups are reported in Table 3. Together, these results replicate earlier findings (Robinson et al., 1980) and indicate that the ECBI is an internally consistent and homogeneous measure.

***Factor Analyses***

Even though internal consistency of the total scales is high and factor analyses in the original standardization samples indicated that a one factor solution best represented the data (Eyberg & Robinson, 1983; Robinson et al., 1980), Burns and Patterson (1991) suggested the presence of three factors, corresponding to the DSM Disruptive Behavior Disorders. Therefore, in the present sample, we explored the underlying factor structure of the ECBI item scores, using the intensity ratings for each item were utilized in the following factor analyses: principal components with varimax rotation, principal components with oblimin rotation, principal factors with varimax rotation, and principal factors with oblimin rotation.

None of the four analyses produced results that were suggestive of multiple, interpretable ECBI factors[1]. Using a principal components analysis with varimax rotation, however, produced a strong first factor on which 33 of the 36 items loaded positively. The three items with negative loadings were "dawdles when dressing" (Item 1; loading = -.045); "lies" (Item 12; loading = -.045); and "hits parent" (Item 16; loading = -.105).

***Demographic Differences in Scores***

The relationship between ECBI scores and demographic variables was examined using Pearson correlation and point-biserial coefficients for continuous and dichotomous variables, respectively. As shown in Table 4, the magnitude of all correlations was low to negligible, although correlations between the Problem Scale and both SES category and child gender were statistically significant. To examine the SES variable further, analysis of variance was conducted using the problem score as a dependent variable and SES category as the independent variable. This analysis was significant, $F(1, 797) = 6.4$, $p < .0001$. Tukey's HSD procedure showed that

the lowest SES category obtained significantly higher problem scores than each of the two highest SES categories. These results are consistent with previous findings (e.g., Burns et al., 1991) reporting lower income and parent education levels associated with an increase in problem ratings.

The effect of child gender was evaluated along with age group (preschool, 2-6 years; elementary, 7-11 years; adolescent, 12-16 years) and race (Caucasian; African-American) in two separate three-way ANOVAs, using each ECBI score as a dependent variable. Because there were relatively few minority children in groups other than African-American, these participants were not included in the analyses. There were no significant main or interaction effects involving child race. A significant gender X age group interaction was obtained for the Problem Score, $F$ (2, 738) = 4.35, $p < .05$. Tests of simple effects revealed a significant ($p < .01$) age group effect within males for the Problem Score (elementary and adolescent males having higher scores than the preschool group). For the elementary age group, a significant gender effect was obtained for the Problem scores, with males having higher mean scores than females. Table 5 displays the mean ECBI scores for age group and gender samples.

***Differences in Scores Based on Respondent Gender***

To evaluate the effect of respondent gender on scale scores, 76 mothers were randomly selected from the original sample of 685. Using t-tests, their ratings were compared to the scores of the 76 fathers who completed the ECBI. The fathers did not differ from the mothers in their scores on either the Intensity Scale, $t$ (150) = 1.28, *ns,* or the Problem Scale, $t$ (150) = .62, *ns*. The mean intensity score for fathers was 91.2 ($SD$ = 29.1) and their mean problem score was 6.3 ($SD$ = 7.2). For the randomly selected mothers, the mean intensity score was 98.1 ($SD$ = 36.3), and their mean problem score was 7.0 ($SD$ = 7.9).

***Discriminative Validity***

Subgroups of children expected to have a higher than average number of behavior problems were identified for validity analyses from background information and compared to the remaining subgroup of "non-problem" children. Because the problem groups were not all mutually exclusive, each problem group was compared individually to the non-problem group using $t$ tests. Because the comparisons involved greatly unequal sample sizes, the degrees of freedom were the separate variance estimates. Mean scores for each of the subgroups are displayed in Table 6.

Children who had ever been referred for treatment of behavior problems but did not receive it (BPR-NT) obtained a significantly higher mean intensity score than non-problem group, $t(27.3) = 7.2$, $p < .001$. These children also had a higher mean problem score, $t(27.0) = 6.2$, $p < .001$. The group of children identified as having received treatment for behavior problems (BPR-T) obtained a significantly higher mean intensity score, $t$ (51.3) = 7.3, $p < .001$, and mean problem score, $t$ (50.2) = 5.6, $p < .001$, than did non-problem children. When compared to the non-problem children, the group for whom treatment for learning disabilities had been recommended but not obtained (LDR-NT) had a significantly higher mean intensity score, $t(22.5) = 4.5$, $p < .001$, and mean problem score, $t$ (21.8) = 4.4, $p < .001$. Finally, the children who had received treatment for learning disabilities (LDR-T) also had significantly higher scores than non-problem children on both the Intensity, $t(84.9) = 4.8$, $p < .001$, and Problem, $t(82.1) = 4.4$, $p < .001$, Scales.

To evaluate sensitivity to treatment, two separate t-tests were conducted for each ECBI score comparing BPR-NT to BPR-T and LDR-NT to LDR-T. For the groups referred for treatment of behavior problems, those children who received treatment obtained a significantly lower score on the Problem Scale, $t$ (72) = 2.2, $p < .05$, and their lower scores on the Intensity Scale were almost significant as well, $t$ (72) = 2.0, $p = .052$. A similar pattern was found for the children with learning disabilities, in that there was a significantly lower score for the LDR-T group compared to the LDR-NT group on the Problem Scale, $t$ (90) = 2.3, $p < .05$, but not on the Intensity Scale, $t(90) = 1.5$, $p > .05$.

# Discussion

This study used parents of children and adolescents from six outpatient pediatric settings in Florida to restandardize the ECBI with a sample demographically representative of the southeastern United States. In contrast to the earlier normative data (Burns et al., 1991; Burns & Patterson, 1990; Eyberg & Robinson, 1983; Robinson et al., 1980), this restandardization sample comprised an adequate and balanced number of children and adolescents at each age level for which the ECBI is designed. The importance of this balance should be emphasized. There are small but statistically significant differences between boys and girls at different ages, but there is no consistent pattern to the differences. Although the differences have little clinical meaning individually, the scores at each gender and age contribute importantly to the total distribution of scores from which the clinical cutoff is derived. Additionally, the present sample resembled recent U.S. Census data in racial distribution, and included adequate representation of rural and urban populations, and children identified as having learning and/or behavior problems.

Compared to the original standardization of the ECBI for children ages 2 to 16 (Eyberg & Robinson, 1983; Robinson et al., 1980), Problem Scale scores show no significant differences, suggesting that parents' reports of the difficulty in managing common behavior problems of childhood and adolescence have remained relatively constant during the past 15 years. In contrast, comparisons between the original and current scores on the ECBI Intensity Scale, which measures the frequency with which the behavior problems occur, showed somewhat higher mean scores than from the original adolescent sample (Eyberg & Robinson, 1983) and somewhat lower scores than from the original child sample (Robinson et al., 1980). Although these differences are statistically significant, it should be noted that they may not be clinically meaningful: they are small in magnitude and may be significant due to the large sample sizes that contribute to power to the statistical tests. The differences may reflect a difference in age composition between studies; however, the present study, which included equal numbers of children at each age, found no significant correlation between ECBI intensity scores and age.

The established cutoff scores (Eyberg & Ross, 1978) of 127 for the Intensity Scale and 11 for the Problem Scale have been validated in clinical studies for both young children (e.g., Webster-Stratton, 1984) and adolescents (e.g., Baden & Howe, 1992). These cutoff scores resulted from the convergence point of one standard deviation above the mean for a normal group and one standard deviation below the mean for a clinical group. If one were to use a cutoff score of one standard deviation above the mean with this restandardization sample, these scores would increase to 132 and 15 for the Intensity and Problem Scales, respectively. These new cutoff scores may be more precise given that the restandardization data is more demographically representative than our earlier normative scores. Raising cutoff scores by even this small degree will impact large numbers of children who cluster close to the mean in a normal distribution and who may no longer be identified as needing treatment. It will be necessary to validate the new cutoff scores in other known groups of clinical and non-clinical children adolescents.

Of interest, comparison of ratings by fathers and mothers was not significantly different within the restandardization sample. Previous research investigating informant differences with the ECBI has been inconclusive. For example, Burns et al. (1991) and Eyberg and Robinson (1983) obtained no respondent gender differences, whereas Robinson et al. (1980) found that mothers' ratings were significantly higher than those of fathers. Similarly, inconclusive findings have been obtained in clinical samples, with mothers' ratings of the behavior of conduct problem children found to be significantly higher than fathers' ratings of the same child in some studies (e.g., Eisenstadt, McElreath, Eyberg, & McNeil, 1994) but not others (e.g., Brestan, Eyberg, Boggs, & Algina, 1996).

Indices of reliability obtained in the restandardization sample were acceptable and consistent with many previous ECBI studies (Eyberg & Pincus, in press). In addition to strong internal consistency for scores across the total sample, this study demonstrated high reliabilities for demographic subgroups including age, gender, and ethnicity. Taken together, these findings suggest that the ECBI is applicable to a diverse range of child and adolescent populations; however, age and gender should be given consideration when interpreting the clinical significance of scores.

Current results were also consistent with many prior psychometric studies collectively demonstrating concurrent validity for both scales of the ECBI (e.g., Boggs, Eyberg, & Reynolds, 1990; Schuhmann, et al., 1996; Webster-Stratton & Eyberg, 1982). Our findings demonstrate the discriminative power of the ECBI scores in detecting the expected differences in the severity of disruptive behavior for children whose parents report a history of referral and/or treatment for behavioral difficulties and/or learning disabilities compared to children without such history. Specifically, children in these groups display conduct problems more frequently and their conduct is more problematic for their parents.

Because of its sensitivity to treatment effects, the ECBI is suitable for child and adolescent treatment outcome research. In this study, comparison of mean scores between parent-identified groups of children with behavior problems and/or learning disabilities showed lower scores for treated groups which were significant for the Problem Scale. The finding that learning disabled children who have received treatment are perceived by parents to exhibit less problematic behavior at home than those learning disabled children not treated is intriguing. As behavioral adjustment may be an important area of educational planning for children placed in remedial or special education services, it appears from our results that children receiving educational interventions for learning problems are better adjusted behaviorally than those not receiving treatment. Perhaps standardized behavior rating scales such as the ECBI would be a useful index for the efficacy of educational and/or behavioral interventions in the classroom.

In summary, we have restandardized the ECBI to update normative data using a large and representative sample of children in the Southeastern U.S. In this sample, reliability analyses indicated strong internal consistency within demographic subgroups as well as the total sample, and discriminative validity analyses replicated prior studies in showing the ability of the ECBI scores to distinguish behavior-problem from non-behavior problem children. Significant age by gender effects were obtained for scores on the ECBI Problem Scale, and we provide separate mean scores for boys and girls within each age group as well as combined means at each age level. However, the interaction of age and gender provide no clear pattern; therefore, the score differences likely lack clinical meaning. Thus, the use of a single cutoff score for treatment selection seems to continue to be appropriate. Cutoff scores of 132 for the Intensity Scale and 15 for the Problem Scale are suggested, but require further study.

# References


American Psychiatric Association. (1994). *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition. Washington, DC: American Psychiatric Association.

Arnold, L. E., Barneby, N. S., & Smeltzer, D. J. (1981). First grade norms, factor analysis, and cross correlation for Conners, Davids, and Quay-Peterson rating scales. *Journal of Learning Disabilities, 14*, 269-275.

Baden, A. D., & Howe, G. W. (1992). Mothers' attributions and expectancies regarding their conduct-disordered children. *Journal of Abnormal Child Psychology, 20,* 467-485.

Boggs, S. R., Eyberg, S. M., & Reynolds, L. (1990). Concurrent validity of the Eyberg Child Behavior Inventory. *Journal of Clinical Child Psychology, 19,* 75-78.

Brestan, E., Eyberg, S.M., Boggs, S. & Algina, J. (1997). Parent-child interaction therapy: Parent perceptions of untreated siblings. *Child and Family Behavior Therapy, 19*, 13-28.

Burns, G. L., & Patterson, D. R. (1990). Conduct problem behaviors in a stratified random sample of children and adolescents: New standardization data on the Eyberg Child Behavior Inventory. *Psychological Assessment, 2*, 391-397.

Burns, G. L., & Patterson, D. R. (1991). Factor structure of the Eyberg Child Behavior Inventory: Unidimensional or multidimensional measure of disruptive behavior? *Journal of Clinical Child Psychology, 20,* 439-444.

Burns, G. L., Patterson, D. R., Nussbaum, B. R., & Parker C. M. (1991). Disruptive behaviors in an outpatient pediatric population: Additional standardization data on the Eyberg Child Behavior Inventory. *Psychological Assessment: A Journal of Consulting and Clinical Psychology, 3,* 202-207.

Campbell, S. B., & Ewing, L. J. (1990). Follow-up of hard-to-manage preschoolers: Adjustment at age 9 and predictors of continuing symptoms. *Journal of Child Psychology and Psychiatry, 31*, 871-889.

Drotar, D., Perrin, E. C., & Stein, R. E. (1995). Methodological issues in using the Child Behavior Checklist and related instruments in clinical child psychology research. *Journal of Clinical Child Psychology, 24,* 184-192.

Dumas, J. E. (1992). Conduct Disorder. In S. M. Turner, K. S. Calhoun, & H. E. Adams (Eds.), *Handbook of Clinical Behavior Therapy* (2nd ed.) (pp. 285-316). New York: Wiley, 1992.

Eisenstadt, T. H., McElreath, L. H., Eyberg, S. M., & McNeil, C. B. (1994). Interparent agreement on the Eyberg Child Behavior Inventory. *Child and Family Behavior Therapy, 16,* 21-27.

Eyberg, S. M. (1992). Parent and teacher behavior inventories for the assessment of conduct problem behaviors in children. In L. VanderCreek, S. Knapp, & T. L. Jackson (Eds.). *Innovations in Clinical Practice: A Source Book* (Vol. 12). Sarasota, FL: Professional Resource Press.

Eyberg, S. M., & Pincus, D. (1999*). Eyberg Child Behavior Inventory and Sutter-Eyberg Student Behavior Inventory: Professional manual.* Odessa, FL: Psychological Assessment Resources.

Eyberg, S. M. & Robinson, E. A. (1983). Conduct problem behavior: Standardization of a behavioral rating scale with adolescents. *Journal of Clinical Child Psychology, 12,* 347-354.

Eyberg, S., & Ross, A. W. (1978). Assessment of child behavior problems: The validation of a new inventory. *Journal of Clinical Child Psychology, 7*, 113-116.

Hollingshead, A. B. (1975). *Four factor index of social status.* Unpublished manuscript, Yale University, New Haven, CT.

Lahey, B., Loeber, R., Hart, E., Frick, P., Applegate, B., Zhang, Q., Green, S., & Russo, M. (1995). Four-year longitudinal study of conduct disorder in boys: Patterns and predictors of persistence. *Journal of Abnormal Psychology, 104*, 83-93.

LaPouse, R., & Monk, M. (1964). Behavioral deviations in a representative sample of children: Variation by gender, age, social class, and family size. *American Journal of Orthopsychiatry, 34*, 436-446.

Reeves, J., Werry, J., Elkind, G., & Zametkin, A. (1987). Attention deficit, conduct, oppositional, and anxiety disorders in children II: Clinical characteristics. *Journal of the American Academy of Child and Adolescent Psychiatry, 26,* 144-155.

Richman, N., Stevenson, J., & Graham, P. (1992). *Preschool to School: A Behavioral Study.* London: Academic Press.

Robinson, E. A., Eyberg, S. M., & Ross, A. W. (1980). The standardization of an inventory of child conduct problem behaviors. *Journal of Clinical Child Psychology, 9*, 22-28.

Schuhmann, E., Durning, P., Eyberg, S., & Boggs, S. (in press). Screening for conduct problem behavior in pediatric settings using the Eyberg Child Behavior Inventory. *Ambulatory Child Health.*

Tarullo, L. B., Richardson, D. T., Radke-Yarrow, M., & Martinez, P. E. (1995). Multiple sources in child diagnoses: Parent-child concordance in affectively ill and well families. *Journal of Clinical Child Psychology, 2*4, 173-183.

U.S. Bureau of the Census (1990). U.S. Census data for national summary level. Database: C90STF3C1.

Webster-Stratton, C. (1984). Randomized trial of two parent-training programs for families with conduct disordered children. *Journal of Consulting and Clinical Psychology, 52,* 666-678.

Webster-Stratton, C., & Eyberg, S. (1982). Child temperament: Relationships with child behavior problems and parent-child interactions. *Journal of Clinical Child Psychology, 11,* 123-129.

Table 1

Normative Data For Individual Eyberg Child Behavior Inventory Items

| | | Intensity Rating | | |
|---|---|---|---|---|
| Item # | Item Content | Mean | SD | % as Problem |
| 1. | Dawdles in getting dressed | 2.98 | 1.74 | 15.3 |
| 2. | Slow in getting ready for bed | 3.54 | 1.96 | 21.6 |
| 3. | Argues with parents about rules | 3.50 | 1.83 | 30.7 |
| 4. | Cries easily | 2.93 | 1.68 | 15.4 |
| 5. | Steals | 1.24 | 0.77 | 5.8 |
| 6. | Physically fights with friends own age | 2.04 | 1.48 | 10.2 |
| 7. | Is easily distracted | 3.38 | 1.85 | 22.6 |
| 8. | Dawdles or lingers at meal time | 2.65 | 1.75 | 16.8 |
| 9. | Refuses to go to bed on time | 3.12 | 1.98 | 24.2 |
| 10. | Gets angry when doesn't get own way | 3.90 | 1.85 | 36.5 |
| 11. | Yells or screams | 3.14 | 1.85 | 25.3 |
| 12. | Lies | 2.26 | 1.41 | 19.3 |
| 13. | Has poor table manners | 2.26 | 1.37 | 11.2 |
| 14. | Does not obey house rules on own | 2.81 | 1.59 | 21.1 |
| 15. | Has temper tantrums | 2.26 | 1.41 | 20.6 |
| 16. | Hits parents | 1.40 | 1.07 | 7.6 |
| 17. | Teases or provokes other children | 2.53 | 1.68 | 20.6 |
| 18. | Physically fights with sisters and brothers | 2.52 | 1.78 | 23.1 |

(table 1 continues)

Table 1 (continued)

Normative Data For Individual Eyberg Child Behavior Inventory Items

| | | Intensity Rating | | |
|---|---|---|---|---|
| Item # | Item Content | Mean | SD | % as Problem |
| 19. | Has short attention span | 2.83 | 1.81 | 20.8 |
| 20. | Has difficulty concentrating on one thing | 2.61 | 1.70 | 19.3 |
| 21. | Refuses to do chores when asked | 2.79 | 1.67 | 22.9 |
| 22. | Acts defiant when told to do something | 2.82 | 1.63 | 25.8 |
| 23. | Whines | 2.86 | 1.75 | 24.7 |
| 24. | Is careless with toys and other objects | 2.63 | 1.70 | 17.3 |
| 25. | Verbally fights with sisters and brothers | 3.11 | 2.02 | 30.7 |
| 26. | Interrupts | 3.29 | 1.72 | 30.2 |
| 27. | Has difficulty entertaining self alone | 2.28 | 1.63 | 10.2 |
| 28. | Refuses to eat food presented | 2.56 | 1.66 | 17.3 |
| 29. | Refuses to obey until threatened with punishment | 2.91 | 1.71 | 29.2 |
| 30. | Sasses adults | 2.53 | 1.67 | 25.3 |
| 31. | Destroys toys and other objects | 1.76 | 1.30 | 10.3 |
| 32. | Verbally fights with friends own age | 2.34 | 1.43 | 12.9 |
| 33. | Constantly seeks attention | 3.09 | 1.77 | 13.2 |
| 34. | Fails to finish tasks or projects | 2.89 | 1.67 | 21.7 |
| 35. | Is overactive or restless | 2.87 | 1.91 | 17.8 |
| 36. | Wets the bed | 1.68 | 1.50 | 8.8 |

Table 2

Normative Data For Eyberg Child Behavior Inventory Intensity and Problem Scales By Age

| | | Gender Distribution | Problem | | Intensity | |
|---|---|---|---|---|---|---|
| Age | n | Male/Female | Mean | SD | Mean | SD |
| 2 | 59 | 38/21[a] | 4.7 | 6.3 | 93.1 | 29.6 |
| 3 | 60 | 30/30 | 8.1 | 8.2 | 113.4 | 37.0 |
| 4 | 60 | 32/28 | 7.4 | 7.8 | 105.3 | 38.1 |
| 5 | 50 | 31/19 | 6.3 | 6.8 | 93.5 | 27.3 |
| 6 | 51 | 28/23 | 4.8 | 6.1 | 88.0 | 28.3 |
| 7 | 50 | 25/25 | 8.5 | 9.5 | 104.1 | 45.0 |
| 8 | 51 | 22/29 | 9.1 | 8.7 | 99.5 | 39.5 |
| 9 | 52 | 32/20 | 6.6 | 8.0 | 99.7 | 33.0 |
| 10 | 54 | 29/25 | 7.4 | 8.4 | 94.2 | 37.1 |
| 11 | 57 | 22/35 | 4.8 | 6.5 | 91.9 | 34.8 |
| 12 | 52 | 28/24 | 7.2 | 6.9 | 95.0 | 32.2 |
| 13 | 50 | 25/25 | 7.4 | 7.4 | 91.9 | 33.2 |
| 14 | 50 | 24/26 | 8.0 | 8.4 | 95.2 | 33.2 |
| 15 | 52 | 29/23 | 6.7 | 7.1 | 87.8 | 35.9 |
| 16 | 50 | 24/26 | 9.4 | 8.6 | 92.8 | 33.8 |

[a]Sample size distributions for gender within each age level were significantly different for age 2 only ($?^2 = 4.9$, $p < .05$).

Table 3

Internal Consistency Coefficients for Intensity and Problem Scales by Demographic Subgroups

| | n | Intensity Scale | Problem Scale |
|---|---|---|---|
| Gender | | | |
| Males | 419 | .95 | .94 |
| Females | 379 | .94 | .93 |
| Age Group | | | |
| 2-6 years | 280 | .94 | .93 |
| 7-11 years | 264 | .95 | .95 |
| 12-16 years | 254 | .94 | .93 |
| Ethnic Group[a] | | | |
| Caucasian | 588 | .95 | .94 |
| African-American | 151 | .94 | .93 |
| Hispanic | 25 | .88 | .95 |

[a]Cronbach's alpha calculated for Caucasian, African-American, and Hispanic participants only because sample sizes were much smaller for other ethnic groups.

Table 4

Correlations Between ECBI Scores and Demographic Variables

| | Intensity Scale | Problem Scale |
|---|---|---|
| Age | -.10 | .06 |
| Gender | -.06 | -.07 [b] |
| Race[a] | -.07 | -.01 |
| Rural/Urban | .03 | .03 |
| SES | -.06 | -.17[b] |

[a]Correlation coefficient based on n=739. Only Caucasian and African-American participants were included as sample sizes were much smaller for other ethnic groups.

[b]Correlation coefficient significant at $p < .05$.

Table 5

Normative Data for ECBI Scores Based on Age Group and Gender

| | | Intensity Scale | Problem Scale |
|---|---|---|---|
| Group | n | Mean (SD) | Mean (SD) |
| 2-6 years | 280 | 99.2 (33.8) | 6.3 (7.2) |
| 7-11 years | 264 | 97.7 (37.9) | 7.2 (8.3) |
| 12-16 years | 254 | 92.5 (33.6) | 7.7 (7.7) |
| Males | 419 | 98.7 (36.2) | 7.6 (8.0) |
| 2-6 years | 159 | 97.7 (33.4) | 6.0 (6.9) |
| 7-11 years | 130 | 103.1 (41.3) | 8.6 (9.1) |
| 12-16 years | 130 | 95.4 (33.8) | 8.5 (7.9) |
| Females | 379 | 94.3 (34.0) | 6.5 (7.4) |
| 2-6 years | 121 | 101.2 (34.4) | 6.7 (7.6) |
| 7-11 years | 134 | 92.4 (33.7) | 5.9 (7.3) |
| 12-16 years | 124 | 89.5 (33.2) | 6.9 (7.4) |

Table 6

Eyberg Child Behavior Inventory Intensity and Problem Scale Means for Problem and Non-Problem Groups

| Group | n | Intensity Scale Mean (SD) | Problem Scale Mean (SD) |
|---|---|---|---|
| Non- Problem | 665 | 91.2 (32.1) | 5.9 (6.9) |
| BPR - NT | 27 | 148.8 (41.3) | 18.0 (10.0) |
| BPR - T | 47 | 130.7 (35.9) | 13.2 (8.7) |
| LDR - NT | 22 | 121.5 (31.3) | 14.4 (8.9) |
| LDR- T | 70 | 110.0 (31.4) | 10.0 (7.4) |

Note. BPR-NT= Behavior Problem, Not Treated; BPR-T=Behavior Problem, Treated; LDR-NT=Learning Disability, Not Treated; LDR-T=Learning Disability, Treated. The two learning disabilities groups were *not* mutually exclusive from the two behavior problem groups (i.e., a child could be a member of *one* of the LDR groups and a member of *one* of the BPR groups).