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Relations between the Kaufman Brief Intelligence Test (KBIT) and the Wechsler Intelligence Scale for Children - Third edition (WISC-III) in Children with Reading Disability

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RELATION BETWEEN KAUFMAN BRIEF INTELLIGENCE TEST
AND WISC-III SCORES OF CHILDREN WITH RD

Abstract
Concurrent validity of the Kaufman Brief Intelligence Test (K-BIT) with the Wechsler Intelligence Scale for Children-Third Edition (WISC-III) was evaluated, as well as the K-BIT's accuracy as a predictor of WISC-III scores, in a sample of young children with reading disabilities. The two measures were administered to 65 children from Atlanta, Boston, and Toronto who ranged from 6-5 to 7-11 years of age at testing. Correlations between the verbal, nonverbal, and composite scales of the K-BIT and WISC-III were .60, .48, and .63, respectively. Mean K-BIT scores ranged from 1.2 to 5.0 points higher than the corresponding WISC-III scores. Standard errors of estimation ranged from 10.0 to 12.3 points. In individual cases, K-BIT scores can underestimate or overestimate WISC-III scores by as much as 25 points. Results suggest caution against using the K-BIT exclusively for placement and diagnostic purposes with young children with reading disabilities if IQ scores are required.

Intelligence assessment currently plays a central role in the diagnosis and placement of children with developmental reading disability (RD). Given that individual intelligence assessments require 1 to 2 hours of testing time, shorter screening instruments that provide an estimate of individual intellectual abilities are being used with some regularity by professionals, schools, and clinical researchers as alternative measures of intellectual development. To be useful, however, screening measures must provide a valid estimate of intelligence scores. It is essential to show their concurrent validity with frequently used, more comprehensive measures of childhood intellectual abilities, such as the Wechsler Intelligence Scale for Children-Revised (WISC-R; Wechsler, 1974) and the current instrument, the Wechsler Intelligence Scale for Children Third Edition (WISC-III; Wechsler, 1991). Evaluation of the concurrent validity of screening instruments is particularly critical for children with RD because any overestimate or underestimate of IQ scores can affect diagnosis and eligibility decisions.

One screening measure, the Kaufman Brief Intelligence Test (K-BIT; Kaufman & Kaufman, 1990), has proven to be a valid estimate of intelligence (as measured by the scales) in a wide range of groups, including nondisabled samples of children and adolescents (Kaufman & Kaufman, 1990), students referred for multidisciplinary evaluation (Canivez, 1995), students referred for poor academic progress (Prewett, 1992a, 1995), incarcerated juvenile delinquents (Prewett, 1992b), children with traumatic brain injury (Donders, 1995), and youth in psychiatric hospitals (Javorsky, 1993). In addition, Slate, Graham, and Bower (1996) found statistically significant correlations between the K-BIT and WISC-R in a combined sample of children with mental retardation and children with specific learning disability (data concerning the types of learning disabilities included in the sample were not provided). In general, these studies found significant correlations between K-BIT IQ Composite scores and Full Scale IQ (FSIQ) scores (range = .64-.87), as well as between K-BIT verbal index scores (i.e., Vocabulary scores) and Verbal IQ (VIQ) scores (range = .67-.83). Correlations between nonverbal scores (i.e., K-BIT Matrices and Performance IQ [PIQ]) were somewhat lower (range = .50-.74) and, in one instance, nonsignificant (.29; Prewett, 1992b). In addition, these studies have generally found mean K-BIT IQ Composite scores to be slightly lower than mean WISC-R FSIQ scores (range = 1.0-6.2 points) and slightly higher than mean WISC-III FSIQ scores (range = 1.6-7.7). This is consistent with the general finding that WISC-R scores tend to be higher than WISC-III scores.

Given that the relationship between the K-BIT and the Wechsler scales may vary across populations (Prewett, 1992a), caution must be exercised when generalizing the aforementioned findings to other groups of children, particularly groups commonly referred for testing, such as children with RD. Even in the most conservative epidemiological estimates, RD is identified in 3% to 6% of school-age children (depending on its definition) and is widely considered the most common type of developmental learning disability (Hynd & Cohen, 1983; Stanovich, 1986). Assuming that the K-BIT is a valid estimate of intelligence in an RD population is problematic, however, because the relation of the K-BIT to more comprehensive measures of intelligence has never been examined in a sample composed exclusively of children with RD.
Concerns about widespread K-BIT use also must be raised when attempts are made to generalize previous findings to groups composed of children from different ethnic backgrounds, socioeconomic levels, and/or geographic regions. Although many studies examining the relations between the K-BIT and the Wechsler scales have included racially diverse samples (Canivez, 1995; Prewett, 1992a, 1992b, 1995), none of the previous studies reported the socioeconomic characteristics of their sample or included participants from more than one geographical location.

Given the age-dependent specifications of K-BIT administration, the generalizability of previous results from samples with broad age ranges (i.e., 7 to 16 years of age) to samples of younger children is also problematic. The K-BIT is composed of three subtests, but the Definitions subtest is administered only to individuals 8 years of age and older. Consequently, because previous studies used samples in which this particular portion of the K-BIT was usually administered (i.e., most participants were 8 or older), generalizability to younger children (i.e., under 8 years) whose Expressive Vocabulary score is the only contribution to the K-BIT verbal index score remains uncertain. Obviously, the relation of the K-BIT verbal index scores to scores on more comprehensive measures of verbal intelligence might be significantly influenced by these differential administration requirements. Concurrent validity of the K-BIT in younger children, however, is important, given that intervention at early stages of RD has the most significant impact on long-term treatment outcome (Blachman, 1997; Foorman, Francis, S. Shaywitz, B. Shaywitz, & Fletcher, 1997), and that most children are referred for RD evaluations after first grade but before fourth grade (i.e., between the ages of 6 and 9).

In addition to validity coefficients (i.e., correlations) and mean differences, the standard error of estimation is another critical factor to examine when assessing the validity of the K-BIT as an estimate of intellectual abilities. All available studies, however, failed to report standard errors of estimation when using the K-BIT scores to predict scores on the Wechsler scales, with the exception of Donders (1995). Donders found high standard errors of estimation between Vocabulary and VIQ (6.87), Matrices and PIQ (10.39), and IQ Composite and FSIQ (7.65), despite moderate to high correlations between the K-BIT scores and their respective WISC-III IQ scores (range = .52-.79).

The present study examined the relation between K-BIT and WISC-III scores in a sample of young children with RD, all of whom were below 8 years of age at the time of K-BIT administration. Children were also included from different geographical regions, different socioeconomic levels, and different racial groups, to better assess the accuracy of generalization.

Method

Participants
The children who participated in this study were drawn from a group of primary-grade students recruited from public and private elementary schools in three large metropolitan areas (i.e., Atlanta, Boston, and Toronto) as part of a large, multisite, treatment intervention study focused on young children with reading disabilities. The students were initially referred by their teachers because of observed difficulties with learning to read. Inclusion criteria for the intervention program consisted of the following: English was their primary language, age fell between 6-4 and 8-6 at the time of initial testing, hearing and vision were within normal limits, and ethnicity was of either Caucasian or African heritage. Exclusion criteria included the following: a K-BIT Composite score below 70, a history of psychotic or other serious psychiatric or neurological illness, and visual or hearing impairment. Common comorbid disorders such as attention-deficit/hyperactivity disorder (ADHD) were allowed to covary naturally and did not serve as exclusionary criteria.

Children in the intervention program represented a wide range of intellectual performance and socioeconomic status (SES). On the WISC-III, the children's FSIQ scores ranged from 68 to 123. Using the Hollingshead Four-Factor SES Scale (Hollingshead, 1975), parental occupational categories ranged from farm
laborers/menial service workers to higher executives, proprietors of large businesses, and major professionals, and parental education levels ranged from less than seventh grade to graduate professional training. Males were overrepresented, consistent with previous research indicating that RD is more common in boys than in girls in referred samples (S. Shaywitz, B. Shaywitz, Fletcher, & Escobar, 1990). Females were, however, oversampled; if a female and male both met inclusion criteria, the female was accepted into the study. The use of multiple sites, ethnicities, and socioeconomic statuses was pursued to enhance the generalizability of treatment findings to children of different cultures and dialects.

Participants were selected for the intervention program if they met either low achievement (LA) or ability-achievement regression corrected discrepancy criteria (AA) for RD (Fletcher et al., 1994; Stanovich & Siegel, 1994). Participants were included under the LA criteria if their K-BIT IQ Composite score was greater than 70 and their average reading achievement on multiple measures was equal to or less than a standard score of 85. Participants were included under the AA criteria if their actual reading scores fell 1 or more standard errors of the estimate below their predicted reading scores (determined by regressing obtained reading scores on intellectual ability to correct for their correlation). The K-BIT IQ Composite score was used as a screening measure of intellectual ability, and achievement level was established on the basis of at least one of the following three scores: (a) the average of the standard scores of the Woodcock Reading Mastery Test-Revised (WRMT-R; Woodcock, 1989) Passage Comprehension subtest, Word Identification subtest, and Word Attack subtest, and the Wide Range Achievement Test-3 (WRAT-3; Wilkinson, 1993) Reading subtest; (b) the Basic Skills Cluster standard score of the WRMT-R; and/or (c) the Total Reading Cluster standard score of the WRMT-R.

Based on these criteria, 74 children participated in the intervention study. Five different intervention programs were implemented involving (a) direct instruction of phonological analysis and blending; (b) overt modeling of specific word recognition strategies; (c) emphasis on specific aspects of lexical retrieval and rate, vocabulary development, and automaticity in orthographic recognition skills; (d) training in classroom etiquette, life skills, and organizational skills; and (e) teaching of basic mathematical concepts and operations.

Of the 74 children, only those less than 8 years of age were selected for the present study. A total of 65 children (Atlanta = 23; Boston = 15; Toronto = 27) fulfilled this age requirement. Informed consent was obtained from a parent or guardian, and assent to participate was obtained from each child. The selected participants ranged in age from 6-5 through 7-11 years (M = 7 years 3 months; SD = 4.4 months) at the time of testing with the K-BIT. The sample consisted of 48 boys and 17 girls, with an ethnic distribution of 35 Caucasian children and 30 children of African heritage. Socioeconomic status was derived using the Hollingshead Four-Factor SES Scale. Thirty seven of the children were classified as average to high SES (social strata 3, 4, or 5), and 27 were classified as low SES (social strata 1 or 2); included in the low-SES group were 14 children whose parents were unemployed. SES data were not available for one family. WRMT-R Basic Reading Cluster and Total Reading Cluster standard scores for the total sample (N = 65) ranged from 53 to 100 (M = 79.7; SD = 9.6) and 50 to 100 (M = 81.9; SD = 9.1), respectively. Fifteen of the children met LA criteria only, 10 met AA criteria only, and 40 met both (LA/AA) criteria for reading disability. Descriptive information concerning the IQ and reading scores of the LA, AA, and LA/AA groups can be found in Table 1.
**Measures**

**Wechsler Intelligence Scale for Children-Third Edition.** The WISC-III is the most recent version of the Wechsler scales for children (ages 6 through 16). This comprehensive measure of children's intellectual abilities is divided into two scales: a verbal scale, composed of six subtests, and a nonverbal/performance scale, composed of seven subtests. Each scale has five designated standard subtests that are used to compute Verbal IQ (VIQ), Performance IQ (PIQ), and Full Scale IQ (FSIQ).

**Kaufman Brief Intelligence Test.** The K-BIT is a short measure of verbal and nonverbal abilities for children and adults (ages 4 through 90). The verbal scale is composed of two subtests, Expressive Vocabulary and Definitions, and the nonverbal scale is composed of one subtest, Matrices. Expressive Vocabulary requires the naming of pictured objects, and Definitions requires the identification of words corresponding to both a brief verbal description and a partial spelling of the word. The Definitions subtest is administered only to individuals 8 years or older. Matrices is a multiple choice task that, in general, requires the recognition of relationships among visual stimuli, both meaningful and abstract.

**Procedure**

All participants completed the K-BIT as part of the screening battery, for inclusion into the treatment program. Most participants (n = 61) completed the WISC-III after the K-BIT (mean interval = 7 months; range = 0 to 16 months); however, 4 participants had been administered the WISC-III within their school systems prior to screening for the study and those WISC-III scores were used (mean interval = 5 months; range = 1 to 10 months before the K-BIT). All the K-BIT subtests were administered within one testing session, whereas some of the WISC-III's were completed over the course of one to three testing sessions within the same week. Advanced doctoral students, postdoctoral fellows, or trained psychometrists conducted the evaluations. K-BIT Vocabulary, Matrices, and IQ Composite standard scores were obtained, WISC-III IQ scores (VIQ, PIQ, and FSIQ), index scores (Verbal Comprehension Index [VCI], Perceptual Organization Index [POI], Freedom from Distractibility Index [FDI], and Processing Speed Index [PSI]), and subtest scores (six verbal subtests and seven performance subtests) were also computed. Of the 65 participants, 8 had prorated WISC-III IQ scores; 7 children were missing a single WISC-III standard subtest score, and 1 child was missing two WISC-III standard subtest scores. The prorated IQ scores of these eight participants were included in the analyses because results did not change significantly when the participants were excluded. In addition, it should be noted that the IQ criteria for exclusion from the larger intervention program (K-BIT IQ Composite score below 70) placed a restriction on the possible range of K-BIT IQ Composite scores in the present study. Because WISC-III IQ scores were not similarly restricted, it is not known whether the following results would stand if a full distribution of K-BIT scores were included.

**Results**

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**TABLE 1**

<table>
<thead>
<tr>
<th></th>
<th>LA group (n=15)</th>
<th>AA group (n=10)</th>
<th>LA/AA group (n=46)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>Range</td>
<td>M (SD)</td>
</tr>
<tr>
<td>K-BIT</td>
<td>85.2 (5.8)</td>
<td>74-94</td>
<td>111.5 (7.4)</td>
</tr>
<tr>
<td>WISC-III</td>
<td>85.1 (6.1)</td>
<td>66-96</td>
<td>103.9 (10.7)</td>
</tr>
<tr>
<td>Basic reading</td>
<td>84.7 (4.4)</td>
<td>75-90</td>
<td>91.9 (5.6)</td>
</tr>
<tr>
<td>Total reading</td>
<td>85.9 (4.6)</td>
<td>74-92</td>
<td>92.7 (4.6)</td>
</tr>
</tbody>
</table>

Note: LA = meets low-achievement criteria; AA = meets ability-achievement regression corrected discrepancy criteria. LA/AA = meets both low-achievement and ability-achievement criteria; Basic reading = Basic Reading Cluster from the Woodcock Reading Mastery Test-Revised; Total reading = Total Reading Cluster from the WRMT-R.
**Correlations Between the K-BIT and the WISC-III**

Pearson product-moment correlation coefficients between the two measures are presented in Table 2. In this sample, all bivariate correlations, excluding correlations of K-BIT subtests with the FDI and the PSI, were significant at the p < .01 level. Differences between correlation coefficients were tested using t tests based on Fisher’s r-to-Z transformation (Hays, 1988). K-BIT Vocabulary had a significantly higher correlation with the WISC-III VIQ than with PIQ, t(62) = 2.63, p < .05, but correlations with WISC-III VCI and POI were not significantly different from each other. No significant differences were found among correlations involving K-BIT Matrices, as this subtest correlated equally well with PIQ, POI, VIQ, and VCI.

<table>
<thead>
<tr>
<th></th>
<th>WISC-III</th>
<th>K-BIT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vocabulary</td>
<td>Matrices</td>
</tr>
<tr>
<td>VIQ</td>
<td>.60**</td>
<td>.47**</td>
</tr>
<tr>
<td>PIQ</td>
<td>.35**</td>
<td>.48**</td>
</tr>
<tr>
<td>FSIQ</td>
<td>.54**</td>
<td>.54**</td>
</tr>
<tr>
<td>VCI (n = 61)</td>
<td>.67**</td>
<td>.45**</td>
</tr>
<tr>
<td>POI (n = 60)</td>
<td>.45**</td>
<td>.53**</td>
</tr>
<tr>
<td>FDI (n = 62)</td>
<td>.11</td>
<td>.28*</td>
</tr>
<tr>
<td>PSI (n = 62)</td>
<td>.16</td>
<td>.11</td>
</tr>
</tbody>
</table>

*Note. N = 65. VIQ = Verbal IQ; PIQ = Performance IQ; FSIQ = Full Scale IQ; VCI = Verbal Comprehension Index; POI = Perceptual Organization Index; FDI = Freedom from Distractibility Index; PSI = Processing Speed Index.

Comparison of Group Means

Descriptive sample characteristics are presented in Table 3. In this sample, significant mean differences were found between the K-BIT IQ Composite and WISC-III FSIQ, t(64) = 2.72, p < .01, and between the K-BIT Vocabulary subtest and WISC-III VIQ, t(64) = 3.24, p < .01, with higher K-BIT scores compared to WISC-III scores. Specifically, the K-BIT IQ Composite mean was 3.6 points higher than the WISC-III FSIQ mean, whereas the K-BIT Vocabulary subtest mean was 5.0 points higher than the WISC-III VIQ mean. In contrast, mean scores on K-BIT Matrices (94.8) and WISC-III PIQ (93.6) were not significantly different, t(64) = 0.77, ns. Although these mean differences may seem relatively small, individual difference scores obtained by subtracting WISC-III scores from their corresponding K-BIT scores indicate a wide range of variability. Individual K-BIT IQ Composite scores ranged from 25 points lower than WISC-III FSIQ to 24 points higher (see Figure 1). Twelve (18%) of the 65 difference scores were more than 1 standard deviation (15 points) from 0. Difference scores between the two verbal scores and the two nonverbal scores were also quite variable: Fifteen (23%) of the 65 verbal difference scores and 16 (25%) of the 65 nonverbal difference scores exceeded 1 standard deviation.
TABLE 3
Means, Standard Deviations, and Ranges of the K-BIT and WISC-III Standard Scores

<table>
<thead>
<tr>
<th>Measure</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>K-BIT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vocabulary</td>
<td>65</td>
<td>94.46</td>
<td>14.56</td>
<td>65–139</td>
</tr>
<tr>
<td>Matrices</td>
<td>65</td>
<td>94.83</td>
<td>10.86</td>
<td>73–133</td>
</tr>
<tr>
<td>IQ Composite</td>
<td>65</td>
<td>94.08</td>
<td>11.99</td>
<td>74–122</td>
</tr>
<tr>
<td>WISC-III</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VIQ</td>
<td>65</td>
<td>99.48</td>
<td>13.07</td>
<td>62–126</td>
</tr>
<tr>
<td>PIQ</td>
<td>65</td>
<td>93.60</td>
<td>13.90</td>
<td>70–117</td>
</tr>
<tr>
<td>FSIQ</td>
<td>65</td>
<td>90.49</td>
<td>12.75</td>
<td>68–123</td>
</tr>
<tr>
<td>VCI</td>
<td>61</td>
<td>90.51</td>
<td>13.88</td>
<td>65–128</td>
</tr>
<tr>
<td>POI</td>
<td>60</td>
<td>93.52</td>
<td>14.75</td>
<td>67–117</td>
</tr>
<tr>
<td>FDI</td>
<td>62</td>
<td>90.30</td>
<td>11.54</td>
<td>58–115</td>
</tr>
<tr>
<td>PSI</td>
<td>62</td>
<td>97.24</td>
<td>15.82</td>
<td>58–140</td>
</tr>
</tbody>
</table>

Note: VIQ = Verbal IQ; PIQ = Performance IQ; FSIQ = Full Scale IQ; VCI = Verbal Comprehension Index; POI = Perceptual Organization Index; FDI = Freedom from Distractibility Index; PSI = Processing Speed Index.

FIGURE 1. Range and incidence of difference scores: K-BIT IQ Composite – WISC-III FSIQ.

TABLE 4
Results of Regression Analyses Using K-BIT Scores to Predict WISC-III Scores

<table>
<thead>
<tr>
<th>Measure</th>
<th>Beta</th>
<th>$R^2$</th>
<th>Adjusted $R^2$</th>
<th>Standard error of the estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>K-BIT vocabulary/VIQ</td>
<td>.60*</td>
<td>.36*</td>
<td>.35</td>
<td>10.53</td>
</tr>
<tr>
<td>K-BIT matrices/PIQ</td>
<td>.48*</td>
<td>.23*</td>
<td>.21</td>
<td>12.33</td>
</tr>
<tr>
<td>K-BIT IQ composites/FSIQ</td>
<td>.63*</td>
<td>.40*</td>
<td>.39</td>
<td>9.96</td>
</tr>
</tbody>
</table>

Note: VIQ = Verbal IQ; PIQ = Performance IQ; FSIQ = Full Scale IQ.
*p < .01.
**Standard Error of Estimation**

Simple regression analyses were performed in order to calculate standard errors of estimation, assessing the accuracy of predicting WISC-III scores using K-BIT scores (see Table 4). K-BIT scores tended to overestimate their respective WISC-III scores. Specifically, the standard errors of estimation between K-BIT Vocabulary and WISC-III VIQ (10.5), K-BIT Matrices and WISC-III PIQ (12.3), and K-BIT IQ Composite and WISC-III FSIQ (10.0) were all very high.

**Discussion**

There is much debate in the learning disability literature concerning the utility of using measures of aptitude to identify children with reading disabilities. Recent studies have revealed that children with reading impairment identified on the basis of low reading achievement and those identified using discrepancy-based definitions perform similarly on a variety of reading-related measures of cognitive ability (Fletcher et al., 1994; Stanovich & Siegel, 1994). These findings suggest that deficits in cognitive skills associated with reading (e.g., phonological processing skills), rather than significant aptitude-achievement discrepancies, are critical in diagnoses of RD. Nevertheless, public policy continues to necessitate the use of discrepancy-based definitions of RD within most educational systems. Within this context, time constraints have encouraged the use of abbreviated measures of aptitude, whose relation to more comprehensive measures of intellectual functioning needs to be demonstrated.

The present study examined the relation between the K-BIT and the WISC-III and extended previous research by focusing on RD within a younger, diverse sample of children and by examining standard errors of estimation. Evaluation of the K-BIT as an estimate of intelligence in this sample is important because (a) a large number of children this age are referred for evaluations of RD; (b) overestimation or underestimation of scores can affect diagnoses and, therefore, eligibility or placement decisions; (c) support exists for the efficacy of intervention when RD is diagnosed in the early grades; and (d) previous studies have not used diverse samples that allow for increased generalizability of results. In addition, restricting the sample to children under 8 years of age is critical because the K-BIT verbal index score for this age group excludes the Definitions subtest. Exclusion of Definitions is important because this subtest appears to tap reading-related skills (e.g., orthographic knowledge) and therefore may underestimate cognitive abilities in individuals with RD.

Consistent with previous research, the results of this study indicate that the K-BIT and the WISC-III are highly related. Moderate correlations were found between the K-BIT IQ Composite and the WISC-III FSIQ and between the K-BIT Vocabulary and WISC-III VIQ, suggesting substantial levels of shared variability among these scores. Also consistent with earlier studies (Donders, 1995; Javorsky, 1993) was the finding that the correlation between the K-BIT Matrices and the WISC-III PIQ was somewhat lower, suggesting that although the Matrices and Performance subtests likely measure related cognitive skills, they may measure different aspects of cognitive abilities as well. For instance, a significant correlation between Picture Completion and Matrices (.45) suggests some overlap in the cognitive skills measured by such subtests (e.g., visual-perceptual analytic skills). In contrast, the absence of a correlation between Coding and Matrices may suggest that an aspect of cognition tapped by one measure is not assessed by the other (e.g., processing speed, graphomotor abilities). In addition, format differences between Matrices and the WISC-III Performance subtests may contribute to the lower correlation between the K-BIT nonverbal index and WISC-III PIQ. For example, unlike most of the WISC-III Performance subtests, Matrices is untimed, uses a multiple choice format, and has no motor demands.

In addition, K-BIT Vocabulary had a significantly higher correlation with the WISC-III VIQ than with PIQ, providing evidence for the convergent and discriminant validity of the K-BIT Vocabulary subtest. On the other hand, Matrices correlated equally well with PIQ, POI, VIQ, and VCI. This suggests limited discriminant validity for the K-BIT Matrices subtest, which is consistent with results from earlier studies (Canivez, 1995; Donders, 1995; Kaufman & Kaufman, 1990). Perhaps the lack of discriminant validity for K-BIT Matrices across these studies reflects the fact that nonverbal tests, in general, tap a variety of different cognitive skills. For instance, performance on some nonverbal tasks may be mediated more by verbal reasoning skills (Sattler, 1992). This seems particularly
possible for the earlier/easier items of the K-BIT Matrices subtest, which involve meaningful visual stimuli (e.g., people and objects) that can be easily labeled (Kaufman & Kaufman, 1990).

Mean differences found between the K-BIT IQ Composite and the WISC-III FSIQ, and between the K-BIT Vocabulary subtest and the WISC-III VIQ, were significant yet relatively small; and the mean difference between K-BIT Matrices and WISC-III PIQ was not significant. However, a closer examination of individual difference scores showed a wide range of variability, with K-BIT-WISC-III differences ranging from 0 to +/-25 points. Moreover, although the mean differences suggest that the K-BIT, in general, slightly overestimates WISC-III scores, examination of individual cases revealed that the K-BIT can either overestimate or underestimate WISC-III scores for this population. When we evaluated the accuracy of the K-BIT scores as a predictor of an individual's WISC-III IQ scores, standard errors of estimation ranged from 10.0 to 12.3. In comparison, the average standard error of measurement of the WISC-III VIQ, PIQ, and FSIQ are 3.53, 4.54, and 3.20, respectively (Wechsler, 1991). These results again suggest that, in individual cases, K-BIT scores can differ markedly from their corresponding WISC-III IQ scores.

Several methodological weaknesses limit the conclusions that can be drawn from this study. First, the sample size was quite small (N = 65) for the use of regression analyses, and, therefore, the results need to be replicated using a larger number of children with RD. Second, because this study was part of a larger investigation concerning the treatment of RD, the research design was not developed a priori to address this issue alone. As a result, administration of the K-BIT and the WISC-III was not properly counterbalanced, and intervals between administrations were somewhat variable. In addition, all of the children were involved in treatment programs as part of the larger intervention study, and the potential influence that treatment may have had on IQ scores was not systematically controlled. Finally, although all examiners were trained in standardized test administration, no specific procedures were carried out to assess the accuracy and consistency of test administration.

In summary, although correlations among the K-BIT and WISC-III IQ scores were moderate and mean differences were relatively small, predicting a young child's WISC-III IQ scores based on his or her K-BIT scores appears to be problematic for this population. Thus, practitioners must exercise considerable caution when utilizing the K-BIT as the only IQ measure in an RD evaluation. This is especially true given the fact that, in many school systems, eligibility and placement criteria used for children with RD often hinge on a matter of a few points. For example, in the present study, several children satisfying IQ criteria (using the discrepancy definition) for RD diagnosis on the basis of their WISC-III scores did not satisfy such criteria on the basis of their K-BIT scores, and vice versa. Therefore, in accordance with Prewett (1995), we believe that the K-BIT should not be used for placement or diagnostic purposes. In fact, in the K-BIT manual itself, Kaufman and Kaufman (1990) state that "proper use of the K-BIT excludes labeling and placement based on the IQ standard score" (p. 5). We also believe that using the K-BIT as the only measure of intellectual functioning in screening or reevaluation test batteries in this population is unwise, given the results of this study. Indeed, the advantages gained in time and money by administering brief screening measures such as the K-BIT would not seem to outweigh the disadvantages caused by the measurement error involved in substituting K-BIT scores for scores on more comprehensive measures of IQ.
AUTHORS' NOTES

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