

# KBIT-2 Revised and KABC–II NU Technical Report

## ■ Introduction

The Kaufman Brief Intelligence Test (2nd ed.) Revised (KBIT™-2 Revised; Kaufman & Kaufman, 2022) Verbal Knowledge and Riddles subtests were designed to be parallel forms of subtests of the same names included on the Knowledge/Gc Scale of the Kaufman Assessment Battery for Children (2nd ed.) Normative Update (KABC™–II NU; Kaufman & Kaufman, 2018). For further details on the development of the subtests, refer to the Chapter 4 Supplement in the KBIT-2 Revised Manual.

A variety of recent changes in the field of psychological testing have placed constraints on the time available to engage in assessment. For example, assessment of specific learning disabilities has become increasingly multifaceted resulting in various new demands placed on the time and attention of school psychologists.

Modified insurance reimbursement rates also affect the time that practitioners in other settings can devote to testing. The increasing need for efficiency creates a demand for short and reliable measures of cognitive ability.

In some settings, practitioners routinely administer a brief intelligence test like the KBIT-2 Revised to screen for cognitive issues. A more comprehensive cognitive ability test (e.g., the KABC–II NU; Wechsler Intelligence Scale for Children® [5th ed.; WISC®–V]; Wechsler, 2014; or Woodcock-Johnson™ IV Tests of Cognitive Abilities [W] IV™ COG; Woodcock et al., 2014) may be administered if screening results indicate more testing is warranted. Decades of research with the K-BIT and the KBIT-2 provide a wealth of data to support the strong relationship between standard scores yielded by this brief measure and standard scores and IQs yielded by comprehensive measures of IQ and multiple cognitive abilities.

If a practitioner determines that a comprehensive intelligence test should be administered after reviewing the KBIT-2 Revised results, the KABC–II NU is the optimal test to select to ensure efficiency and control measurement error because Verbal Knowledge and Riddles do not need to be readministered. The parallel form subtest design across the two tests makes it feasible to substitute the KBIT-2 Revised Verbal Knowledge and Riddles scores for the KABC–II NU Verbal Knowledge and Riddles scores when deriving the KABC–II NU Knowledge/Gc and Fluid-Crystallized Index (FCI) composite scores (i.e., KBIT-2 Revised substitution).

Implementing KBIT-2 Revised substitution reduces overall KABC–II NU administration time by approximately 10–20 minutes (i.e., the administration time for Verbal Knowledge and Riddles), which helps to maintain rapport and effort. This additional time is then available for the practitioner to assist the examinee with other clinical, psychoeducational, and assessment activities.

Furthermore, using KBIT-2 Revised substitution avoids complicating interpretation. If the same task is administered twice, practitioners must interpret comprehensive test results with caution because the comprehensive measure's scores may be questionable because of the effects of repeated administration that can occur such as:

- procedural learning (i.e., the acquisition of knowledge or experience, relevant to a strategy or procedure, that can be used to improve performance on a particular task);
- variation in examinee effort (perhaps because of boredom or discouragement because a similar task was already administered); or

- regression to the mean (e.g., the tendency for extreme observations upon first testing to be closer to the mean upon second testing).

These issues can be better controlled by choosing KBIT-2 Revised substitution to avoid repeated administration.

Table 1.1 presents the relations between the KBIT-2 Revised and the KABC–II NU (see also Chapter 5 of the KBIT-2 Revised Manual). As shown, the Verbal Knowledge and Riddles subtests of the two tests are highly correlated with one another (.75).

**Table 1.1** Correlations Between the KBIT-2 Revised and the KABC–II NU

KABC–II NU score	KBIT-2 Revised					KABC–II NU	
	Verbal Knowledge	Riddles	Verbal	Nonverbal	IQ Composite	Mean	SD
Number Recall	.37	.26	.34	.34	.41	10.4	2.8
Word Order	.31	.41	.37	.31	.40	9.8	2.7
Rover	.17	.35	.26	.34	.35	9.9	2.8
Triangles	.35	.41	.39	.35	.42	9.9	3.1
Atlantis	.37	.46	.45	.31	.46	9.9	2.5
Rebus	.21	.42	.32	.55	.49	10.2	2.9
Pattern Reasoning	.27	.45	.37	.61	.56	9.9	2.8
Story Completion	.47	.55	.55	.25	.51	9.9	3.2
Riddles	.76	.75	.82	.40	.76	10.4	3.1
Verbal Knowledge	.75	.75	.82	.41	.74	9.7	3.4
Sequential/ <i>Gsm</i>	.38	.38	.41	.36	.45	100.6	14.1
Simultaneous/ <i>Gv</i>	.27	.46	.36	.36	.42	99.5	14.5
Learning/ <i>Glr</i>	.36	.54	.47	.53	.58	100.3	12.8
Planning/ <i>Gf</i>	.47	.63	.58	.52	.65	98.8	14.3
Knowledge/ <i>Gc</i>	.80	.79	.87	.44	.79	100.5	16.1
Mental Processing Index	.45	.65	.57	.57	.67	101.4	13.7
Fluid-Crystallized Index	.60	.75	.71	.60	.77	101.9	13.6
<b>KBIT-2 Revised</b>							
<b>Mean</b>	10.0	10.0	99.9	101.3	100.6		
<b>SD</b>	3.2	2.5	14.4	11.4	12.5		

Additionally, the subtest means indicate that although the KBIT-2 Revised and the KABC–II NU were normed in different years, the subtests produce highly similar mean scores. Furthermore, neither version of the subtests produces consistently higher or lower mean scores. Therefore, KBIT-2 Revised substitution is a compelling best practice consideration for joint use of the two tests that balances accuracy and efficiency and is worthy of further evaluation.

## ■ KBIT-2 Revised Substitution Studies

Two studies were conducted to examine the impact of repeated administration. The first focused on mean comparisons of composites obtained as usual or using KBIT-2 Revised substitution and the second examined the frequency of composite score discrepancies between composite scores derived as usual or using substitution.

### Mean Comparisons

#### Sample

The sample used to study mean comparisons included 44 examinees ages 7–17 (those examinees from the larger  $N = 99$  sample from the KBIT-2 and KABC–II counterbalanced study) who were administered the KBIT-2 followed by the KABC–II. The mean testing interval was 2.2 days (range = 0–15 days). The self- or parent education levels of the sample were 20.9% with 0–11 years, 9.3% with 12 years, 39.5% with some college, and 30.2% with a college degree and higher. The sample’s examinees were 58.1% White, 18.6% African American, 11.6% Hispanic, and 11.6% other races/ethnicities. The sample was 53.5% female and 46.5% male.

#### Updating to KBIT-2 Revised and KABC–II NU Scores

The pertinent analyses relate more to the KBIT-2 Revised and the KABC–II NU rather than the older versions, but these data were collected using the KBIT-2 and the KABC–II in 2004–2005. Therefore, examinees first were assigned new KBIT-2 Revised equated scores using the procedures described in the Equating KBIT-2 Revised and KBIT-2 Data section in Chapter 4 of the KBIT-2 Revised Manual. Then, new KABC–II NU composite scores were also derived and assigned using the updated norms tables. Because of missing data, the sample for deriving the FCI was  $N = 25$ .

### Analyses and Results

Mean comparisons between the observed and estimated composite scores were conducted. Table 1.2 presents the mean Knowledge/Gc and FCI composite scores derived under two conditions.

- For the Obtained column, the KBIT-2 was administered before the KABC–II, and the KABC–II Verbal Knowledge and Riddles subtest scaled scores were used to derive KABC–II NU composites as usual.
- For the Substitution column, the KBIT-2 was administered before the KABC–II, and KBIT-2 Revised substitution was used to derive the composites.

**Table 1.2** Comparison of the KABC–II NU Composite Scores

KABC–II NU composite score	Obtained		Substitution		Difference	<i>t</i>	<i>p</i>	Standard difference
	Mean	<i>SD</i>	Mean	<i>SD</i>				
Knowledge/Gc	99.9	16.0	100.0	14.0	0.09	0.07	NS	0.01
Fluid-Crystallized Index	102.5	12.7	102.1	12.3	–0.36	–0.67	NS	–0.03

The composite scores obtained by substitution are highly consistent with the obtained scores (which are based on the second administration of Verbal Knowledge and Riddles). The mean Knowledge/Gc score in the obtained condition is slightly lower; however, the mean differences are not statistically significant, and the effect sizes are both negligible.

## Composite Score Discrepancies

### Sample

The sample used to examine the percentages of discrepancies between composite scores calculated as usual and those derived using KBIT-2 Revised substitution included 99 examinees ages 7–18 who were administered the KBIT-2 and the KABC–II in counterbalanced order in 2004–2005. The full counterbalanced sample was used to ensure enough data were available for planned analyses by ability level. The mean testing interval was 2.2 days (range = 0–15 days). The self- or parent education levels of the sample were 19.2% with 0–11 years, 16.2% with 12 years, 28.3% with some college, and 35.4% with a college degree and higher. The sample’s examinees were 58.6% White, 17.2% African American, 14.1% Hispanic, and 10.1% other races/ethnicities. The sample was 53.5% female and 46.5% male.

### Updating to KBIT-2 Revised and KABC–II NU Scores

As with the mean comparisons study, examinees first were assigned new KBIT-2 Revised equated scores using the procedures described in the Equating KBIT-2 Revised and KBIT-2 Data section in Chapter 4 of the KBIT-2 Revised Manual. Then, the KBIT-2 Revised norms were applied to the raw scores. New KABC–II NU composite scores were also derived and assigned using the updated norms tables.

### Analyses and Results

Table 1.3 reports the percentages of the overall counterbalanced study sample obtaining various differences between the obtained and estimated composite scores by substitution. The results are presented by ability level (40–100 [ $n = 54$ ]; 101–160 [ $n = 45$ ]), and for the overall sample (Total column  $N = 99$ ). Ability level is classified using the KBIT-2 Revised IQ Composite. Because of missing data, the sample for deriving the FCI was  $N = 62$ .

**Table 1.3** Percentages of Various Discrepancies Observed Between Composite Scores Obtained as Usual and Derived by Substitution by Ability and Overall

KABC–II NU composite score	Discrepancy	Ability level by KBIT–2 Revised IQ Composite		Overall
		40–100	101–160	
Knowledge/Gc	+/-3	38.9	31.1	35.4
	+/-5	61.1	48.9	55.6
	+/-7	72.2	57.8	65.7
Fluid-Crystallized Index	+/-3	90.0	68.8	79.0
	+/-5	100.0	90.6	95.2
	+/-7	—	100.0	100.0

Overall, 65.7% and 100% of discrepancies between composite scores are less than or equal to 7 points for Knowledge/Gc and the FCI, respectively. Relative to the higher ability group, the lower ability group experienced slightly smaller effects of repeated administration on the Knowledge/Gc composite. For example, 72.2% of the lower ability group obtained Knowledge/Gc discrepancies of 7 points or less, as opposed to only 57.8% of the higher ability group. The relations between ability level and discrepancies between composite scores obtained as usual and derived by substitution were examined, however, and they were not statistically significant for either Knowledge/Gc [ $\chi^2(3, N = 99) = 2.27, p = .51$ ] or for the FCI [ $\chi^2(2, N = 62) = 5.05, p = .08$ ].

The impact of repeated administration of these subtests is smaller on the FCI than on Knowledge/Gc. This is likely because in the obtained condition both subtests used to derive Knowledge/Gc were second-administration subtests, but only 20% of the sum of standard scores used to derive the FCI was based on second-administration subtests (because all examinees in this study were ages 7–18, they were administered the 7–18 battery).

## Discussion

Sometimes, even if the KBIT-2 Revised has been administered, it may be necessary to also administer the KABC–II NU. Administering the KABC–II NU Verbal Knowledge and Riddles in this situation may result in repeated administration effects that influence the KABC–II NU composite scores.

There are some limitations to this research which may restrict the interpretation and generalizability of the results. First, discrepancies between scores derived using KBIT-2 substitution and obtained scores may exist because the sample used to evaluate substitution was administered the KBIT-2 Revised and the KABC–II NU in full. Second, when discrepancies are presented by ability level, the sample sizes are relatively small. Prior research has demonstrated that retest value gains vary according to ability level (Rapport et al., 1997). Thus, it is possible that more or fewer differences/similarities across ability levels exist than those demonstrated in the present study. Additionally, the research samples were composed of nonclinical examinees only. The results, therefore, may not generalize to clinical populations.

## ■ Procedures for KBIT-2 Revised Substitution

### Subtest Administration Order

If the KBIT-2 Revised Verbal Knowledge and Riddles subtests have been administered first, the administration order of the remaining KABC–II NU subtests should follow the subtest order on the KABC–II NU Record Form.

### Testing Interval

Minimizing the time that elapses between administration of the KBIT-2 Revised and the remaining KABC–II NU subtests is recommended as best practice. Intervening events in the examinee’s life or health or changes in mental status between testing sessions may decrease consistency of results and increase difficulty in interpretation. However, use clinical judgment to determine whether the testing interval is appropriate, given the examinee’s individual situation.

## Using KBIT-2 Revised Scaled Scores to Derive KABC–II NU Composite Scores

The KBIT-2 substitution process differs slightly by the KABC–II NU age band.

### Ages 7–18

After deriving the KBIT-2 Revised Verbal Knowledge and Riddles scaled scores, sum those two subtests’ scaled scores, and use that sum of scaled scores with Table D.2 of the KABC–II NU Manual Supplement to derive Knowledge/Gc.

Use the Knowledge/Gc sum of scaled scores that was derived by KBIT-2 Revised substitution along with the sums of scaled scores for Sequential/Gsm, Planning/Gf, Learning/Glr, and Simultaneous/Gv. Add all five sums of scaled scores together to find the sum of scaled scores for the FCI. Use that sum of scaled scores with Table D.2 of the KABC–II NU Manual Supplement to derive the FCI.

## Ages 4–6

After deriving the KBIT-2 Revised Riddles scaled score, sum it with the KABC–II NU Expressive Vocabulary scaled score. Use that sum of scaled scores with Table D.2 of the KABC–II NU Manual Supplement to derive Knowledge/*Gc*.

Use the Knowledge/*Gc* sum of scaled scores that was derived by KBIT-2 Revised substitution along with the sums of scaled scores for Sequential/*Gsm*, Learning/*Glr*, and Simultaneous/*Gv*. Add all four sums of scaled scores together to find the sum of scaled scores for the FCI. Use that sum of scaled scores with Table D.2 of the KABC–II NU Manual Supplement to derive the FCI.

## Using KBIT-2 Substitution With the KABC–II NU Record Form

### Step 1. Recording the KBIT-2 Revised Scaled Scores on the KABC–II NU Record Form

On the front page of the KABC–II NU Record Form, locate the age-appropriate Subtest Scores table. To ensure that the substitution is clear to others who may access records in the future, do not record the KBIT-2 Revised subtest total raw scores on the KABC–II NU Record Form. Instead, record the KBIT-2 Revised subtest scaled scores in the column immediately to the right of the Raw Score column.

Clearly indicate above the table that substitution was used by writing, for example, “KBIT-2 Revised scaled scores used for VK and RI subtest scaled scores.” If the examinee is ages 4–6, only note this for Riddles.

One option is to mark through the Verbal Knowledge and Riddles (or just Riddles for ages 4–6) sections of the KABC–II NU Record Form as a reminder not to administer those subtests. If possible, attach the KBIT-2 Revised Record Form to the KABC–II NU Record Form after the KABC–II NU has been administered and scored.

### Step 2. Completing the KABC–II NU Record Form Summary Page

After recording the KBIT-2 Revised subtest scaled scores, refer to the Calculating scale and global scale indexes section in Chapter 4 in the KABC–II Manual (Kaufman & Kaufman, 2004) to finish calculating the desired KABC–II NU composite scores.

## ■ Conclusion

It is best practice to administer the full KABC–II NU if the KBIT-2 Revised has not already been administered. KBIT-2 Revised substitution is recommended as a best practice consideration if the KBIT-2 Revised was administered before the KABC–II NU. This is particularly important if the KBIT-2 Revised testing occurred relatively recently.

In cases where there are concerns that repeated administration effects could persist over longer intervals (e.g., 6 months), use KBIT-2 Revised substitution with more caution. These concerns may vary across ability level and across individuals, as may intervening events and cognitive development between administration of the KBIT-2 Revised and the KABC–II NU. Therefore, use clinical judgment in determining if KBIT-2 Revised substitution is appropriate in the examinee’s individual case. If using KBIT-2 Revised substitution, it is recommended to specify clearly in the testing report that KABC–II NU scores were derived by KBIT-2 Revised substitution.

## ■ References

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