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ABSTRACT

A study involving 120 students enrolled in the Mobile County Public School System of Alabama was conducted to investigate the comparability of the Wechsler Intelligence Scale for Children-Revised (WISC-R) and the Kaufman Assessment Battery for Children (K-ABC) instruments in their ability to select students for placement in programs for the gifted, learning disabled, and educable mentally retarded. Each student was administered the WISC-R and K-ABC by the same examiner to minimize examiner bias and influence. Results indicate that there was a significant relationship between the WISC-R and the K-ABC in the sets of children selected for placement in learning disabled and gifted programs. There was no significant relationship between these two instruments in the sets of children selected for programs for educable mentally retarded persons. The removal or de-emphasis of the language component in the K-ABC diminishes the effect of psycholinguistic deficit for many learning disabled students. The removal of the acquired facts from the intelligence scales of this instrument provides a more efficient measurement of the fluid intelligence of these students. (TJH)

AN EXAMINATION OF THE RELATIONSHIP BETWEEN THE WISC-R AND K-ABC FOR SELECTION OF STUDENTS FOR SPECIAL EDUCATION PROGRAMS

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Introduction and Background

Historically, the major effort to measure directly an individual's capability for scholastic success has been directed at the measurement of "intelligence," which is usually defined as the individual's ability to learn (Schwarz, 1971). Thorndike (1971) indicated that there has been a consensus that individuals differ greatly, and to a large extent genetically, in the facility with which they acquire new information and skills. Anastasi (1982) noted that "traditionally, the function of psychological tests has been to measure differences between individuals" (p.3). The intelligence test was one early attempt to quantify this difference as a basis for educational prediction (Thorndike, 1971).

Jensen (1981) posited that tests are only indicators, useful when advanced knowledge of a situation or the outcome of some endeavor is desired. He further stated that tests are well constructed and administered to serve a useful function in the decision-making process required in the placement of students into appropriate educational settings, as well as in other placement situations. Anastasi (1982) noted that one of the initial problems that stimulated the development of intelligence tests was

the identification of the mentally retarded. Phillips (1982) noted that more than 75 years ago Binet developed an intelligence test to identify children who would benefit from educational methods different from those used in the regular classrooms. The discipline of school psychology primarily evolved from the necessity of school systems to develop a more objective and precise means of identifying and/or classifying children who required special educational services because of lower mental functioning (Bardon, 1982). Identification of "special" children remains one of the central functions of intelligence tests and school psychologists.

Currently, the Wechsler Intelligence Scale for Children-Revised (WISC-R; Wechsler, 1974) is one of the most prevalently used individual intelligence tests for educational prediction and the determination of students for programs for the mentally retarded, learning disabled, and gifted. The Kaufman Assessment Battery for Children (K-ABC; Kaufman & Kaufman, 1983a) is a recenly publ shed individually administered test of intelligence and achievement which nas gained acceptance as an alternative to the WISC-R.

Utilization of the K-ABC to evaluate referrals for three special populations, i.e., educable mentally retarded (EMR), learning disabled (LD), and gifted would enable psychometrists/school psychologists to gather new and different

types of data concerning the intellectual functioning and cognitive processing of these children. It would allow these professionals to make more specific and varied recommendations concerning placement and the possibilities for the child's functioning based on information which has not previously been possible to obtain from test results.

The K-ABC Interpretive Manual (Kaufman & Kaufman, (1983b) provides support for the similarity between the K-ABC and WISC-R. Studies involving normal children and children of various exceptionalities yielded correlations between the WISC-R Full Scale IQ and K-ABC Mental Processing Composite which ranged from .57 to .77. Lyon and Smith (1985) conducted a study comparing performance on the K-ABC, WISC-R, and Woodcock Johnson Psycho-Educational Battery (W-J) for a group of 79 elementary students referred for LD evaluation. Correlation coefficients of .52, .64, and .65 were obtained for the Broad Cognitive Ability Cluster (BCA) and the K-ABC Mental Processing Composite, the K-ABC Achievement Scale and BCA, and the BCA and the WISC-R Full Scale IQ, respectively.

The results supported the use of the mental processing score on the K-ABC as an alternative to the WISC-R for the assessment of general ability in students referred for LD evaluation. The moderate correlations between both the MPC and Full Scale IQ and BCA indicate that the same general construct is being measured

with all three instruments, but also the K-ABC has enough unique qualities to contribute new information to the assessment of ability (Lyon & Smith, 1985).

Naglieri and Haddad (1984) compared the process of identification of learning disabilities using the WISC-R/PIAT and K-ABC ability/achievement discrepancy profiles. Thirty-three children in kindergarten through Grade 6 composed the study sample.

The MPC/PIAT correlation coefficient (.67) was found to be approximately equal to the Full Scale/PIAT Total correlation (.64). Only the K-ABC Achievement Scale emerged as a significant predicator of WRAT scores (R = .59).

Naglieri and Haddad concluded that this investigation provided construct validity for the K-ABC as a measure of ability and achievement for this learning disabled sample. These findings suggested that the K-ABC is a viable alternative to the WISC-R in diagnosing learning disabilities (Naglieri & Haddad, 1984).

McCallum, Karnes, and Edwards (1984) conducted a study with gifted students to determine the comparability of mental ability scores from the WISC-R, K-ABC, and Stanford-Binet. Correlational and mean difference analyses from 41 gifted childred were computed.

Correlation coefficients ranged in value from .03 to .74. The three mean K-ABC processing scores were noted to be significantly lower than the IQs from the WISC-R and the Stanford-Binet for all possible comparisons. A 16.19-point difference between the K-ABC, MPC, and Stanford-Binet IQ was obtained. A 12.18-point difference between the K-ABC/MPC and the WISC-R Full Scale IQ was reported. The authors indicated that much of the MPC-IQ discrepancy noted in the study's results could be explained through the emphasis of the Stanford-Binet, the WISC-R Verbal IQ on verbal abilities (Sattler, 1982), and the K-ABC's format which was deliberately designed to minimize expressive skills and assess verbal reasoning with predominantly nonverbal tases. They pointed out that the K-ABC Sequential Processing Scale may measure abilities that are relatively poorly developed in gifted children and comparatively unused by the Stanford-Binet and WISC-R.

Naglieri (1985) examined normal, learning disabled, and borderline mentally retarded children's performance on the WISC-R and K-ABC. Mean comparisons and overall correlation, subtest and scale patterns, intratest scatter, and the relationship between achievement and mental processing scales were examined for the three matched samples of children.

Results revealed no significant differences between the WISC-R Full Scale IQ and K-ABC MPC by group. The Full Scale IQ

and MPC standard scores were noted to correlate .85 for the entire sample with all other subscale correlations ranging in value from .65 to .90. All correlations were significant at the .01 level.

Naglieri (1985) concluded that the similarity of WISC-R Full Scale IQ and K-ABC Mental Processing Composite mean scores evidenced in this study suggested that these two instruments may be expected to yield similar scores for children like those included in the sample. The similarity also implies that this new instrument may be suitable when placment decisions need to be made.

The purpose of the present study was to determine whether the WISC-R and K-ABC differentially select children for placement in EMR, LD, and gifted programs. Of practical importance to school psychologists is the feasibility of the interchangeable use of the K-ABC and WISC-R in the process of effecting special education placement.

Method

Subjects and Procedures

The subjects of the study consisted of 120 students enrolled in programs for the educable mentally retarded, learning disabled, and gifted in the Mobile County Public School System. Forty students from each of the three special populations comprised the sample for the study. Those in each group consisted of 20 whites matched with 20 blacks on the variables of sex, age, and

socioeconomic status. The ages of the subjects ranged from 6 years tc 12 1/2 years. Students in Grade 1 through 7 were included in this study. Fifty percent of the students involved in each group of white and black students were female, and 50% were male.

The age of each white subject was matched within 6 months of the age of the corresponding black child. Socioeconomic status was matched according to the eligibility for the state's free lunch program.

The county served by this school system extends 1,248 square miles. Its population is 364,379 and per capita income is $17,011. There are 91 schools in the system attended by 69,000.

After the samples were selected, each student was administered the WISC-R and K-ABC by the same examiner in order to minimize examiner bias and influence. These tests were administered by a certified psychometrist/school psychologist within an interval of two to eight weeks. The practice effect was controlled by counterbalancing the order of test administration. One-half of the 120 students involved in the study was administered the WISC-R first, the other one-half, the K-ABC first. Intervening variables such as educational experiences and maturation were controlled by a resonably short time interval between tests.

In this study, those students who were classified as LD and EMR were administered the Wide Range Achievement Test-Revised (WRAT-R; Jastak & Wilkinson, 1984) during the initial evaluation. All scores were recorded in additional to the sex, race, socioeconomic status, and educational classification of each student. WRAT-R scores were recorded in order to establish a relationship between tests.

All tests were scored according to standardized procedures delineated in the test manuals. Such scores were recorded and analyzed.

Materials

The Wechsler Intelligence Scale for Children-Revised is an individually administered intelligence test appropriate for children and youth whose ages range from 6 to 16 years. It is comprised to two separate scales. The Verbal Scale consists of the Information, Similarities, Arithmetic, Vocabulary, Comprehension, and Digit Span (optional) subtests. The Performance Scale is composed of the Picture Completion, Picture Arrangement, Block Design, Object Assembly, Coding, and Mazes (optional) subtests. Verbal, Performance, and Full Scale IQs are computed, each having a mean of 100 and a standard deviation of 15. This test is administered in approximately 50 to 75 minutes.

The Kaufman Assessment Battery for Children (K-ABC, Kaufman & Kaufman, 1983a), a recently published individually administered

test of intelligence and achievement, is the most recent addition to individual intelligence tests currently in use. The K-ABC can be administered to children ranging in age from 2 1/2 to 12 1/2 years. As Kaufman and Kaufman (1983b) indicated, "the K-ABC is predicated on the distinction between problem solving and knowledge of facts. The former set of skills is interpreted as intelligence; the latter is defined as achievement" (p. 2). The theoretical basis of the K-ABC derives from the convergence of many cognitive and neuropsychological theories in which intelligence is viewed as being comprised of two types of abilities: sequential, temporal and analytic versus holistic, gestalt, and spatial. Thus, a Sequential Processing Scale and a Simultaneous Processing Scale combine to make up a global scale of intelligence, the Mental Processing Composite. (Kaufman, 1983b). The three subtests included in the Sequential Processing Scale are Hand Movements, Number Recall, and Word Order. They each require the child to solve problems in a serial, step-wise manner. The Simultaneous Processing Scale consists of seven subtests including Magic Window, Face Recognition, Gestalt Closure, Trianges, Matrix Analogies, Spatial Memory, and Photo Series. Each task is analogic, spatial and organizational and requires the integration of many stimuli at once. The Sequential Processing Scale, Simultaneous Processing Scale, and Mental Processing Composite, as well as the achievement components of the K-ABC, yield standard scores with means of 100 and standard deviations of 15 (Kaufman & Kaufman, 1983b).

The Wide Range Achievement (WRAT; Jastak & Jastak, 1978) has been used extensively as a measure of achievement in psychoeducational assessments of school-aged children. The 1984 revision, the Wide Range Achievement Test-Revised (WRAT-R; Jastak & Wilkinson, 1984), is an age-normed psychometric instrument the purpose of which is to "measure the codes which are needed to learn the basic skills of reading, spelling, and arithmetic" (p. 1). The authors indicated that this test can be benefical in the determination of learning ability or learning disability when used in conjunction with a test of intelligence which has the same standard deviation units as the WRAT-R.

As in the 1978 edition of the WRAT, each of the three subtests, i.e., reading, spelling, and arithmetic, is divided into two levels. Level 1 was prepared for use with students between the ages of 5 years 0 months and 11 years 11 months. Level 2 was designed for individuals from 12 years 0 months through adulthood. Each level requires from 20 to 30 minutes to administer.

Four types of scores are provided in reporting WRAT-R results; raw scores, grade equivalents, standard scores, and percentiles. The WRAT-R standard scores are deviation quotients which have a mean of 100 and a stand deviation of 15 (Jastak & Wilkinson, 1984).

Analysis of Data

To determine whether the WISC-R and K-ABC differentially selected children for placement in EMR, LD, and gifted programs, the phi coefficient was computed. The CROSSTABS subprogram of SPSS^X (1986) was used to compute and display a crosstabulation table for the variables. The phi coefficient was implemented in order to determine whether a systematic relationship exists between the placment in a special education program, i.e., EMR, LD, or gifted, and the administration of either the K-ABC or WISC-R. This statistic was a suitable measure of association, i.e., a measure of strength of relationship for a 2 x 2 table (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975).

For the purposes of this study, placement in the EMR program was contingent on an IQ below 75. LD placement was determined by the Reynolds (1985) formula:

$$\hat{Y} - Y_i \geq$$

$$SD_Y \, (2 - 1.65 \, SE_{\hat{Y} - Y_i}) \sqrt{1 - r_{xy}^2}$$

Y - Y represents the discrepancy score, the residual based on the regression of aptitude on achievement. SD represents the standard deviation of the two scales (scaled to a common metric). If expressed in z-scores, 1 - r is the standard deviation of the distribution of Y - Yi. SE is the statistical significance of difference of the residual Y - Yi (Reynolds, 1985). Gifted placement was dependent on scoring a minimum of 127 on either intelligence test administered, the K-ABC or the WISC-R, for those

students classified as middle socioeconomic status. For those who were determined to be of lower socioeconomic status, a minimum IQ of 115 was required for placement in this program.

Results and Discussion

The CROSSTAB subprogram of SPSS[X] yielded a phi coefficient of 0.39 ($p < .05$) for the gifted students. Four students were classified as gifted on the basis of scores yielded by both instruments. Thirteen additional students were classified on the WISC-R but not on the K-ABC. Twenty-three students were not classified as gifted on either test (Table 1).

Table 1

Gifted Children Placed vs. Children Not Placed Using WSIC-R vs. K-ABC Standard Scores

	WISC-R	
	Not Placed	Placed
K-ABC		
Not Placed	23	13
Placed	0	4

The CROSSTAB subprogram of SPSS[X] produced a phi coefficient of 0.49 ($p < .05$) for the gifted students who were classified on the Full Scale IQ of the WISC-R or on the MPC or Achievement global standard score of the K-ABC. Six students were classified as gifted by the K-ABC and the WISC-R. Twenty-three students were not classified as gifted on either instrument. Eleven were placed with the WISC-R but not with the K-ABC (Table 2).

Table 2

Gifted Students Placed vs. Not Placed on the WISC-R Full Scale IQ vs. K-ABC MPC or Achievement Standard Score

	WISC-R	
	Not Placed	Placed
K-ABC		
Not Placed	23	11
Placed	0	6

For EMR students, a phi coefficient of .005 was computed. This value was not significant at the .05 level. Twenty-five students were classified as EMR on the basis of scores obtained on both instruments. Twelve additional students were classified as EMR with the WISC-R but not with the K-ABC. Two students were classified on the K-ABC but not on the WISC-R (Table 3).

Table 3

EMR Children Placed vs. Not Placed Using WISC-R and K-ABC Standard Score

	WISC-R	
	Not Placed	Placed
K-ABC		
Not Placed	1	12
Placed	2	25

For LD students, separate phi coefficients were utilized for determination of LD placement in three areas of achievement.

These calculations were based on WRAT-R Reading, Spellling, and Arithmetic scores.

For LD students administered the WRAT-R Reading subtest, a phi coefficient of 0.82 was computed ($p < .01$). Using the WRAT-R Reading subtest as a measure of achievement, five students were classified as LD using scores from both instruments. Two additional students were classified on the basis of scores obtained on the WISC-R, but not on the K-ABC. These data indicate a significant systematic relationship between the WISC-R and K-ABC in the sets of children selected for inclusion in the LD program when the WRAT-R Reading subtest was utilized as an achievement test (Table 4).

Table 4

LD Children Placed vs. Not Placed Using WRAT-R Reading with WISC-R vs. K-ABC

	WISC-R	
	Not Placed	Placed
K-ABC		
Not Placed	31	2
Placed	0	5

For LD students administered the WRAT-R Spelling test, a phi coefficient of 0.81 ($p < .01$) was obtained. With the WRAT-R Spelling subtest used as a measure of achievement, two students were classified as LD on the basis of scores received on both intelligence measures. One additional student was placed on the basis of K-ABC scores, but not WISC-R scores. These results indicated that when the WRAT-R Spelling subtest was used as an indicator of achievement, there was a significant relationship between the K-ABC and WISC-R in the sets of children selected for placement in the LD program (Table 5).

Table 5

LD Children Placed vs. Not Placed Using WRAT-R Spelling with WISC-R vs. K-ABC

	WISC-R	
	Not Placed	Placed
K-ABC		
Not Placed	35	0
Placed	1	2

For LD students administered the WRAT-R Arithmetic subtest, a phi coefficient of 0.85 ($p < .01$) was yielded. This obtained value indicated that for those students administered the Arithmetic subtest of WRAT-R as a measure of achievement, the K-ABC and WISC-R selected similar sets of childen for LD placment. Seven children were classified as LD based on scores obtained on both instruments. Two additional students were placed on the basis of scores yielded by the WISC-R, but not the K-ABC (see Table 6).

Table 6

LD Children Placed vs. Not Placed Using WRAT-R Arithmetic with WISC-R vs. K-ABC

	WISC-R	
	Not Placed	Placed
K-ABC		
Not Placed	29	2
Placed	0	7

These data sugguest there is a significant relationship between the WISC-R and K-ABC in the sets of children they select for placement in the LD program. The data regarding three exceptionalities partially indicated that there is a significant relationship between the WISC-R and K-ABC in the sets of children selected or not selected for placment in the gifted, EMR, and LD programs. Only for EMR placment was there no significant relationship between the two instruments in the sets of children chosen for inclusion in this program. A systematic relationship was observed between the K-ABC and WISC-R in the sets of children selected for placment in the gifted and LD program.

Conclusion

The main issue dealt with in this study was the comparability of the WISC-R and K-ABC in their selection of students for special education programs, i.e., EMR, LD, and gifted. One of the utlimate practical considerations of a new intelligence test is whether it selects the same or different sets of children for

inclusion in special programs. Because the philosophy of the K-ABC is so different from that of existing tests, this consideration is a justified concern.

For LD students, the removal or de-emphasis of the language component in the K-ABC diminishes the effect of the psycholinguistic deficit of many of these individuals. The removal of the acquired facts from the intelligence scales of this instrument provides a more efficient measurement of the fluid intelligence of these youngsters.

In the present study, the phi coefficient revealed that there was a significant relationship between the WISC-R and K-ABC in the sets of children selected for placement in LD and gifted programs. There was not a significant relationship between these two instruments in the sets of children selected for the EMR program, however.

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