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THE KAUFMAN ASSESSMENT BATTERY FOR CHILDREN AND SCHOOL ACHIEVEMENT: A VALIDITY STUDY

Joseph E. Zins
David W. Barnett
School Psychology Program, University of Cincinnati

The Kaufman Assessment Battery for Children (K-ABC) was designed to measure problem-solving skills in a manner not directly related to prior academic achievement. As with any new instrument, it is important to study the relationship of the K-ABC to traditional measures. This study compared the results of the K-ABC to the Wide Range Achievement Test with a nonreferred sample of 40 children. The results suggest for the most part that integrated cognitive processes are related to tasks found in the two achievement tests. Both tests appear to measure different skills, although the reading subtests were substantially correlated.

The Kaufman Assessment Battery for Children (K-ABC) (Kaufman & Kaufman, 1983) represents a current attempt to improve cognitive assessment, and one that bears close scrutiny in what is likely to be a controversial future for intelligence testing (Barnett, 1983). Unlike most measures of intellectual ability, the K-ABC is designed to measure problem-solving skills in a manner less directly related to prior academic achievement or other planned learning experiences.

The Kaufmans' intent in developing the K-ABC was to incorporate recent advances in cognitive psychology and neuropsychology. The K-ABC contains scales for assessing two types of mental processing abilities (Simultaneous and Sequential) and one for acquired knowledge (Achievement). The most comprehensive account of simultaneous and sequential processing is presented by Das, Kirby, and Jarman (1975, 1979), who were influenced by the work of Luria (1966). Das et al. (1979) consider the basic cognitive processes in intellectual tasks to be comprised of both information processing, or *coding,* and *planning.* Das and his colleagues' work has focused on the coding aspect, which involves the "metaprocesses" of simultaneous and sequential information integration (Das et al., 1979, p. 49). Although an oversimplification of their discussion, the following definitions of simultaneous and successive processing are offered: "Simultaneous integration refers to the synthesis of separate elements into groups, . . . often taking on spatial overtones. . . . Any portion of the result is at once surveyable without dependence upon its position in the whole." (1975, p. 89). Well-known tasks like Raven's Coloured Progressive Matrices and Memory for Designs are strongly associated with simultaneous

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Address reprint requests to Joseph E. Zins, School Psychology Program, Mail Location #2, University of Cincinnati, Cincinnati, OH 45226.

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processing skills. "Successive information processing refers to processing . . . in a serial order . . . [whereby] a system of cues consecutively activates the components" (1975, p. 89). Tasks including visual short-term memory and digit span (forward) provide good estimates of these skills.

By including separate processing and achievement scales, the authors of the K-ABC attempted to minimize the influence of cultural background and specific learning experiences on the child's measured level of intellectual functioning. Their effort represents one response to the concerns of many researchers and professionals who have voiced the opinion that major contemporary intelligence scales provide an alternative measure of school attainment or privilege but ignore important processes in learning. Another potential advantage of the K-ABC is that the intelligence and achievement scales were standardized on the same population.

As with any new instrument, it is important to establish the relationship of the K-ABC to other traditional measures. While comparisons of children's performance on the K-ABC and on two measures of cognitive functioning have been completed (Zins & Barnett, in press), the present study investigates the relationships between the K-ABC and the Wide Range Achievement Test (WRAT) (Jastak & Jastak, 1978). Although the WRAT has been criticized by a number of authors (e.g., Salvia & Ysseldyke, 1981), it continues to be one of the most commonly employed measures of achievement used by school psychologists (Goh, Teslow, & Fuller, 1981) due to its brevity and ease of administration. Furthermore, it seems likely that if the K-ABC becomes widely accepted in the field as a measure of intellectual functioning, psychologists may begin to substitute its achievement scale for the more limited WRAT. For these reasons, it is important to assess the concurrent validity of the K-ABC and the WRAT.

METHOD

Subjects

The subjects in this study were 40 children (17 males and 23 females; 36 whites and 4 blacks) ranging in age from 6-0 to 12-5 ($\overline{X}$ = 9.66, SD = 2.02). All of the subjects were attending grades K through 7, and all were without known physical, emotional, or cognitive impairments of a significant nature; none had been identified previously as being in need of special education services. The sample's mean WISC-R Full Scale IQ was 117.11, while their Stanford-Binet IQs averaged 114.55.

Instruments and Procedures

As part of a larger study, the K-ABC, WISC-R, and Stanford-Binet were administered to each child in a counterbalanced order. The WRAT was randomly administered along with one of the major scales. Both the WRAT and the K-ABC scales have means of 100 and standard deviations of 15.

The WRAT consists of three subtests labeled Reading (Word Recognition), Spelling, and Arithmetic. The K-ABC contains Simultaneous and Sequential processing scales, the Mental Processing Composite (Simultaneous + Sequential),

and the Achievement Scale. The Achievement Scale is composed of the following subtests:

Expressive Vocabulary: The child names objects in a series of photographs (not administered to the age group included in the study).
Faces and Places: The child names the famous person or place pictured in a series of photographs.
Arithmetic: The child demonstrates knowledge of numbers, mathematical concepts, and computational skills (use of pencil and paper not permitted).
Riddles: A list of characteristics is read to the child, who must then name the object or concept.
Reading Decoding: The child identifies letters and words.
Reading Understanding: The child acts out commands from written sentences.

RESULTS AND DISCUSSION

The means and standard deviations of the K-ABC and the WRAT are reported in Table 1. Since the WRAT does not have a composite achievement score, no comparisons of mean scores could be computed.

Pearson product-moment correlation coefficients and levels of significance among the WRAT subtests and the K-ABC scales are reported in Table 2. Several interesting relationships should be noted. First, while all but one of the intercorrelations were statistically significant, the correlations were in the low to moderate range. This magnitude of relationship for the Sequential and Simultaneous scales with school achievement was expected (e.g., Das et al., 1979), with one exception. At first glance, it may not be intuitively obvious that spelling, requiring a serial performance, should be more closely related to simultaneous processing. Das et al. (1979) hypothesized that spelling would be more closely tied to successive (sequential) processing. The fact that the present study did not support this hypothesis may

TABLE 1
MEANS AND STANDARD DEVIATIONS OF K-ABC AND WRAT

	$\bar{X}$	*SD*
K-ABC		
Sequential Processing	107.23	16.40
Simultaneous Processing	112.58	13.61
Mental Processing Composite	112.03	14.28
Achievement	112.68	13.33
Faces & Places	108.55	12.78
Arithmetic	110.43	16.06
Riddles	113.23	15.77
Reading Decoding	110.30	13.90
Reading Understanding	112.06	14.24
WRAT		
Reading (Word Recognition)	116.05	15.31
Spelling	107.03	14.40
Arithmetic	100.28	14.96

TABLE 2
INTERCORRELATIONS OF THE K-ABC AND THE WRAT

K-ABC	WRAT		
	Reading	Spelling	Arithmetic
Sequential Processing	.50***	.22	.35*
Simultaneous Processing	.55***	.44**	.47**
Mental Processing Composite	.62***	.39*	.49***
Achievement	.66***	.45**	.46**

*$p < .05$
**$p < .01$
***$p < .001$

be due to the difficulty level of the spelling words (e.g., easier words are more simultaneous) or that spelling is more automatic and spatial in nature (i.e., the whole word is at once surveyable).

Typical correlations between the WRAT and the WISC-R Verbal and Full Scale IQs have been about .60 in prior investigations (Sattler, 1982). The results in Table 2 (with the exception of Reading and the Mental Processing Composite) are below these levels but are more consistent with the correlations reported between the WRAT and the WISC-R Performance Scale (about .40) (Sattler, 1982).

An examination of the differences between the correlations of each WRAT subtest and the K-ABC Simultaneous versus Sequential Processing Scale was undertaken. No statistically significant differences were found for Arthimetic ($z = .768$, $df = 39$, $p > .05$) or Reading ($z = .353$, $df = 39$, $p > .05$) (Glass & Stanley, 1970, p. 313). Spelling achieved statistical significance ($z = 1.356$, $df = 39$, $p < .10$, one-tailed).

Intercorrelations for the K-ABC Processing and Achievement Scale subtests are reported in Table 3. Again, no statistically significant differences in the correlations were found with Arithmetic on Simultaneous versus Sequential Processing ($z = .336$, $df = 39$, $p > .05$) or with Reading Understanding on Simultaneous versus Sequential Processing ($z = .136$, $df = 39$, $p > .05$). In addition, the Reading/Decoding comparison (Simultaneous versus Sequential Processing) likewise failed to achieve statistical significance ($z = 1.762$, $df = 39$, $p > .05$). Other comparisons between the K-ABC Processing and Achievement scales were not

TABLE 3
INTERCORRELATIONS OF THE K-ABC PROCESSING SCALES AND THE ACHIEVEMENT SUBTESTS

K-ABC	Simultaneous Processing	Sequential Processing	Mental Processing Composite	Achievement
Faces & Places	.43**	.44**	.53	.48**
Arithmetic	.50	.45**	.56	.78
Riddles	.41**	.32*	.43**	.85
Reading Decoding	.66	.41**	.64	.79
Reading Understanding	.50**	.48**	.58	.91

Note. All significant at $p < .001$ except (**) where $p < .01$ and (*) where $p < .05$.

made because no meaningful relationships could be expected based on prior theory or research.

The lack of significant differences in achievement subtest correlation coefficients on the Simultaneous versus Sequential Processing Scales warrants some comment. Previous investigators have described reading as equally dependent on both processes (Das et al., 1979; Kirby & Das, 1977), and the present findings overall appear to support this contention. However, Das et al. have stated that "mathematics achievement may be more dependent upon simultaneous processing" (p. 86), while Kaufman (1979) has described arithmetic as a sequential processing task. As noted, Das and colleagues (1979) also thought that spelling should be related more highly to successive processing. None of these assertions about arithmetic and spelling appears to be supported by these data. It should be noted, however, that both Das et al. (1979) and Kaufman (1979) acknowledge that achievement relies on an integration of both types of processing. The K-ABC Mental Processing Scales, while upholding the simultaneous/sequential dichotomy (Kamphaus, Kaufman, & Kaufman, Note 1), are not pure measures of either process. The present findings support the need for integrated processes related to school achievement, as both simultaneous and sequential processing skills were related to success on the academic tasks included on the K-ABC (Table 3) and the WRAT (Table 2).

The intercorrelations of the K-ABC Achievement Scale subtests and the WRAT subtests are presented in Table 4. Of particular note is the relatively low correlation between the K-ABC Arithmetic and the WRAT Arithmetic. In addition, while the correlations between the K-ABC reading subtests and the WRAT Reading were somewhat higher, they still were lower than might be anticipated, considering the fact that they would be expected to measure similar skills.

Correlations between the WRAT and other achievement tests (e.g., Stanford Achievement Test, Metropolitan Achievement Test, Peabody Individual Achievement Test) have been in the vicinity of .60 in previous studies (Sattler, 1982). The present results are somewhat lower for most of the Achievement subtests (except for Reading Decoding and Reading Understanding) as well as for the overall Achievement Scale (Table 2) (with the exception of the WRAT Reading).

TABLE 4
CORRELATIONS BETWEEN THE K-ABC ACHIEVEMENT SCALE AND THE WRAT

	WRAT		
K-ABC	Reading	Spelling	Arithmetic
Faces & Places	.44**	.22	.35*
Arithmetic	.44**	.34*	.40**
Riddles	.46**	.40**	.41**
Reading Decoding	.60***	.44**	.28
Reading Understanding	.67***	.40*	.37**

* $p < .05$
** $p < .01$
*** $p < .001$

The K-ABC Achievement Scales are innovative with respect to test format and response mode. This may be the most parsimonious explanation for the relatively moderate correlations between the achievement measures. Performance may be influenced by the stimuli presented or by the modality through which a child must respond. For example, the K-ABC Arithmetic is theme-related; an attempt was made to provide an intrinsically interesting backdrop for the questions. The subtest also requires two response modes (e.g., pointing, verbal expression).

CONCLUSIONS

The results of the present study offer some preliminary insights into the structure of the K-ABC and warrant further study. In particular, the ability of the Simultaneous and Successive Processing Scales to measure these processes needs more extensive investigation. There is also some suggestion that the K-ABC Achievement Scale measures somewhat different skills than the WRAT; this may have implications for examiners who wish to substitute one instrument for the other. Overall, the K-ABC appears to have somewhat lower correlations with the WRAT than have other intellectual and achievement instruments.

Although it is outside the scope of this study, a major consideration is whether the use of the K-ABC will improve academic services to low-achieving children. Das et al. (1979) discuss this issue in some detail, though not in relationship to the K-ABC. Further research will have to address (a) the relationship between the discrete information processing skills and school achievement, (b) the development of alternative treatment strategies, (c) the degree of modifiability of processing skills, and (d) the inherent difficulties in conducting aptitude × treatment interaction studies (e.g., Cronbach & Snow, 1977).

References

Barnett, D. W. *Nondiscriminatory multifactored assessment: A sourcebook.* New York: Human Sciences Press, 1983.

Cronbach, L. J., & Snow, R. E. *Aptitudes and instructional methods.* New York: Irvington Publishers, 1977.

Das, J. P., Kirby, J. R., & Jarman, R. F. Simultaneous and successive synthesis: An alternative model for cognitive abilities. *Psychological Bulletin,* 1975, *82,* 87–103.

Das, J. P., Kirby, J. R., & Jarman, R. F. *Simultaneous and successive cognitive processes.* New York: Academic Press, 1979.

Glass, G. V., & Stanley, J. C. *Statistical methods in education and psychology.* Englewood Cliffs, N.J.: Prentice-Hall, 1970.

Goh, D. S., Teslow, C. J., & Fuller, G. B. The practice of psychological assessment among school psychologists. *Professional Psychology,* 1981, *12,* 696–706.

Jastak, J. F., & Jastak, S. *The Wide Range Achievement Test.* Wilmington, Del.: Jastak Associates, 1978.

Kaufman, A. S. *Intelligent testing with the WISC-R.* New York: Wiley, 1979.

Kaufman, A. S., & Kaufman, N. L. *Kaufman Assessment Battery for Children: Examiner manual, National Standardization Program.* Circle Pines, Minn.: American Guidance Service, 1981.

Kaufman, A. S., & Kaufman, N. L. *Kaufman Assessment Battery for Children (K-ABC).* Circle Pines, Minn,: American Guidance Service, 1983.

Kirby, J. R., & Das, J. P. Reading achievement, IQ, and simultaneous-successive

processing. *Journal of Educational Psychology,* 1977, *69,*564–570.

Luria, A. R. *Human brain and psychological processes.* New York: Harper & Row, 1966.

Salvia, J., & Ysseldyke, J. E. *Assessment in special and remedial education* (2nd ed.). Boston: Houghton Mifflin, 1981.

Sattler, J. M. *Assessment of children's intelligence and special abilities* (2nd ed.). Boston: Allyn & Bacon, 1982.

Zins, J. E., & Barnett, D. W. A validity study of the K-ABC, WISC-R, and Stanford-Binet with nonreferred children. *Journal of School Psychology,* in press.

Reference Note

1. Kamphaus R. W., Kaufman, A S., & Kaufman, N. L. *Cross-validation study of sequential-simultaneous processing at ages 2½–12½.* Paper presented at the annual meeting of the American Psychological Association, Washington, D.C., August 1982.