DOCUMENT RESUME

ED 280 889 TM 870 219

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TITLE K-ABC/McCarthy Performance for Repeating and Nonrepeating Preschoolers.
PUB DATE Mar 87
NOTE 19p.; Paper presented at the Annual Meeting of National Association of School Psychologists (New Orleans, LA, March 4-8, 1987).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Achievement Tests; Analysis of Variance; *Cognitive Measurement; *Comparative Testing; Grade Repetition; High Risk Students; Intelligence Tests; *Learning Disabilities; *Preschool Children; Preschool Education
IDENTIFIERS *Kaufman Assessment Battery for Children; McCarthy Scales of Childrens Abilities

ABSTRACT

This study compares the McCarthy Scales of Children's Abilities (MSCA) and the Kaufman Assessment Battery for Children (K-ABC) profiles of successful and unsuccessful preschoolers with learning disabilities. Subjects, 40 preschool students, were tested at the beginning and at the end of the preschool year and were placed into repeating or nonrepeating groups based on the preschool staff's recommendations. Both groups scored higher on the K-ABC than on the MSCA. Repeaters scored lower on both scales. At the time of retesting (K-ABC only), the repeaters, as compared to the nonrepeaters, scored significantly lower on each K-ABC global scale. On the second testing, repeaters scored higher on Mental Processing Composite (MPC) and Simultaneous Processing (SP) subscales, while the nonrepeaters scored significantly higher on MPC, SP, and Achievement subscales. The repeaters displayed a more uniform global scale pattern on the K-ABC while the nonrepeaters displayed significantly higher mean Simultaneous scores as compared to mean Sequential scores at time of retesting. Stability coefficients ranged from .55 to .84 for the nonrepeaters and from .83 to .95 for the repeaters. (Author/JAZ)

K-ABC/McCarthy Performance for Repeating and Nonrepeating Preschoolers

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Paper presented at Annual Meeting of National Association of School Psychologists, New Orleans, March 1987.

Running head: K-ABC/MCCARTHY PERFORMANCE

Abstract

K-ABC and McCarthy Scales performance of 40 at-risk preschool students was examined. Subjects were tested at the beginning and end of the preschool year and were placed into repeating or nonrepeating groups based on the preschool staff's recommendations for their placement the following year. Repeaters displayed lower scores on both the McCarthy Scales and the K-ABC. At the time of retesting (K-ABC only), the repeaters, as compared to the nonrepeaters, scored significantly lower on each K-ABC global scale. MPC and Simultaneous scores were significantly higher at Time 2 testing for the repeaters, while MPC, Simultaneous and Achievement scores were significantly higher for the nonrepeaters. The repeaters displayed a more uniform global scale pattern on the K-ABC while the nonrepeaters displayed significantly higher mean Simultaneous scores as compared to mean Sequential scores at time of retesting. Stability coefficients (corrected for restriction of range) ranged from .55 to .84 for the nonrepeaters and from .83 to .95 for the repeaters.

During the past 15 years, several instruments have been developed to assess preschool children's abilities and skills, including the McCarthy Scales of Children's Abilities (MSCA; McCarthy, 1972), the Kaufman Assessment Battery for Children (K-ABC; A. Kaufman & N. Kaufman, 1983), and the Stanford-Binet Intelligence Scale: Fourth Edition (S-B:4; Thorndike, Hagen & Sattler, 1986). In order to establish validity for these instruments numerous studies comparing the performance of children on the scales have been conducted (e.g. Hinshaw, Morrison & Carte, 1985, August; Klanderman, Wisehart & Alter, 1983; Zucker, 1985, April). In addition, issues such as stability of performance (Telzrow, Proefrock & Hartlage, 1985, August; Valencia, 1985) and predictors of school success or achievement (Massoth, 1985; Zimmerman & Eiduson, 1985, August) have been addressed.

One issue that has received little attention is the determination of characteristics distinguishing handicapped preschoolers who are successful in preschool programs from those who are not. Thus, the study was designed to compare the MSCA and K-ABC profiles of successful and unsuccessful preschoolers.

Method

Subjects

Subjects for the study included 40 students (29 males and 11 females) enrolled in the preschool program in a suburban, midwestern school district. The subjects ranged in age from 50 months to 60 months (M = 55.1; SD = 3.3) and had been identified

for preschool placement on the basis of performance on the DIAL-R, speech and language screening and other measures including the MSCA. The majority of the children had presenting problems that were learning and/or language related.

Procedure

The subjects were tested with the K-ABC in September and then retested in May of the same academic year. At the end of the academic year the preschool staff recommended to the parents of each child that the child either repeat the preschool program or enroll in kindergarten. The two groups for the study were formed in this way and K-ABC results were not considered in the placement decisions. The repeaters included 10 males and 3 females, while the nonrepeaters included 19 males and 8 females.

Results and Discussion

The descriptive results of the study are presented in Tables 1 and 2. At the initial testing the group of preschoolers who would subsequently be retained consistently scored in the slow learner to low average range on both the MSCA and K-ABC with mean global scores ranging from 67.00 to 80.54. The group of preschoolers who would subsequently advance to kindergarten consistently scored in the low average to average range on both instruments with mean global scores ranging from 83.50 to 94.74. For both groups higher scores were obtained on the K-ABC than on the MSCA. On the K-ABC,

especially, the range of scores was restricted for both groups.

Insert Table 1 about here

At the time of the second testing (after completion of one year of preschool), the repeaters scored in the low average range with mean global scores ranging from 80.62 to 83.31, while the nonrepeaters scored in the average range with mean global scores ranging from 93.85 to 104.30. The repeaters displayed a less variable pattern of global scores than did the nonrepeaters. The range of scores was again restricted for both groups.

Insert Table 2 about here

One way analyses of variance were used to compare MSCA and K-ABC performance between the repeaters and the nonrepeaters at Time 1 (September) and K-ABC performance at Time 2 (May). Significant differences were noted at Time 1 on four of the six scales of the MSCA: General Cognitive Index (GCI; F (1,26) = 12.30, $p < .01$; Perceptual-Performance (PP; F (1,24) = 7.05, $p < .05$); Verbal (F (1,26) = 10.00, $p < .01$); Motor (F (1,24) = 4.62, $p < .05$); and on all four global scales of the K-ABC: Mental Processing Composite (MPC; F (1,38) = 48.42, $p < .001$), Sequential (SEQ; F (1,38) = 15.59, $p < .001$), Simultaneous(SIM; F (1,38) = 29.76, $p < .001$) and Achievement (ACH; F (1,38) = 15.19, $p <$

.001). The repeaters scored lower than the nonrepeaters on all scales with differences between group means of 19 points on GCI, 15 points on MPC and 14 points on ACH. Significant differences were also noted at Time 2 on all four global scales of the K-ABC: MPC (F (1,38) = 46.65, $p < .001$), SEQ (F (1,38) =11.40, $p < .002$), SIM (F (1,38) = 48.25, $p < .001$), and ACH (F (1,38) = 27.37, $p < .001$). Again the repeaters scored lower than the nonrepeaters on all scales with differences between group means of 19 points on MPC and 18 points on ACH.

Although the scores for both groups were higher at Time 2 testing, gains were larger for the nonrepeater group. For example, mean MPC scores changed from 91.40 to 99.44 and mean ACH scores from 94.74 to 98.63 for the nonrepeaters, while the repeaters mean MPC scores were 76.15 and 80.77, respectively, and mean ACH scores were 80.54 and 80.62, respectively, at Time 1 and Time 2 testing.

At Time 1 testing both groups displayed similar profiles in which the majority of students, 10 (77%) of the repeaters and 18 (67%) of the nonrepeaters, did not exhibit a preferred processing style (simultaneous or sequential). At Time 2 testing 17 of the nonrepeaters (63%) and 6 of the repeaters (46%) exhibited a preferred processing style. A SIM > SEQ preference was indicated by 14 (82%) of the nonrepeaters who exhibited a processing style preference. For the six repeaters with a processing style preference, there was an equal number of SIM > SEQ and SIM < SEQ. A chi square analysis for this difference at Time 2 testing

(learning style preference vs no learning style preference) was not significant with $X^2 = 1.05$, $p > .05$. However, the failure to exhibit a preference for simultaneous or sequential learning coupled with lower overall ability scores may be a characteristic of potential learning problems and should continue to be examined with larger sample sizes. These results are presented in Table 3.

Insert Table 3 about here

The results of t-tests for related samples computed on the K-ABC global standard scores yielded significant differences between Time 1 and Time 2 scores for both groups. For the repeater group significant differences were noted on MPC (t (12) = 2.90, $p < .02$) and SIM (t (12) = 2.66, $p < .03$). For the nonrepeater group significant differences were noted on MPC (t (26) = 5.66, $p < .001$), SIM (t (26) = 6.67, $p < .001$) and ACH (t (26) = 2.82, $p < .01$). In each case Time 2 scores were higher than Time 1 scores. Both groups displayed relatively stable SEQ scores. The repeaters additionally displayed a consistent ACH score across the academic year, while the nonrepeaters' mean ACH score increased by four points. Both groups demonstrated increases in mean SIM scores, with an increase of 11 points by the nonrepeaters. This increase was almost twice as large as the repeaters' six point increase. It is of interest that mean SEQ scores changed very little from Time 1 to Time 2 testing (1.77 points for the repeaters and 2.59 for the

nonrepeaters). The nonrepeaters, however, demonstrated stronger gains in mean SIM score as compared to the repeaters (10.89 vs 5.77) and this may have compensated for the lack of change in SEQ processing.

T-tests for related samples were also performed on the global standard scores to ascertain significant differences in performance patterns. On the MSCA significant differences were noted for the repeaters only at Time 1 testing with GCI < PP, GCI < Q, GCI < Verbal, GCI < Memory, Motor < Verbal and Motor < Q ($p < .05$ for all comparisons). On the K-ABC one significant difference was noted for the repeaters at Time 1, ACH > MPC ($p < .03$), and no significant differences were noted at Time 2. For the nonrepeaters no significant differences were noted at Time 1 testing on the K-ABC and only one significant difference, SIM>SEQ ($p < .001$), was noted at Time 2 testing. Thus, the at-risk preschool students who subsequently repeated preschool demonstrated a more variable global scale pattern on the MSCA with their lowest mean score on GCI which is the best measure of overall ability on the MSCA. Likewise, the mean MPC score on the K-ABC was lower than the other global scores, although the differences were not significant as with the MSCA. The nonrepeaters, as a group, developed strengths in SIM processing while the repeaters, as a group, displayed a uniform global scale pattern within the low average range.

Finally, Pearson product moment correlations were calculated for Time 1 vs Time 2 performance for each K-ABC global scale by

group (repeaters, nonrepeaters). Correlation coefficients were corrected for restriction in range using the procedure outlined by Guilford (1954). All correlations were significant ($p < .001$) and greater than .55 for both groups indicating much stability for each global scale. Valencia (1985) obtained similar correlations, ranging from .76 to .90, using a sample of 42 Mexican-American children enrolled in a Head Start program and tested with the K-ABC in the Spring and Fall of 1983. Although the correlations were larger for the repeaters than the nonrepeaters on each global scale (range of .83 to .95 vs .55 to .84), the differences between the two groups, ranging from .08 to .31, were not statistically significant. Nevertheless, the trend was for less stability with the nonrepeaters suggesting that their cognitive abilities, as measured by the K-ABC, may be less stable than the abilities of the repeaters, and perhaps, more amenable to intervention. This issue merits further investigation with larger samples of preschool students (both nonexceptional and at-risk). Correlation results are presented in Table 4.

Insert Table 4 about here

The limited sample size, especially for the group of repeaters, requires that the results of this study be interpreted cautiously. Two findings, however, deserve further investigation. A greater percentage of nonrepeaters had developed a preferred

processing style at Time 2 testing as compared to the repeaters (63% vs 46%, respectively). Although this result was not statistically significant, perhaps due to small sample size, it merits further study. Secondly, the stability coefficients for the repeaters were larger on all K-ABC global scales than for the nonrepeaters with differences ranging from .08 on ACH to .31 on MPC. Since sample size may have contributed to the lack of statistical significance for this result, it should be investigated further as it would have important ramifications if verified in future studies.

In conclusion, the at-risk students who subsequently repeated preschool were characterized by lower ability scores on both the K-ABC and the McCarthy Scales at initial testing. At time of retesting (K-ABC only) the repeaters again scored significantly lower on each global scale of the K-ABC. While both groups demonstrated increases on the global scales of the K-ABC between Time 1 and Time 2 testing, the nonrepeaters' gains were larger. At Time 1 testing, the repeaters as a group demonstrated a variable pattern on the McCarthy Scales with mean GCI lower than the mean scores on PP, Q, Verbal and Memory, while the nonrepeaters' pattern was uniform with no significant differences among the scales. On the K-ABC, both groups displayed a relatively uniform pattern at Time 1 testing. At the time of retesting, however, the repeaters demonstrated a more uniform pattern while the nonrepeaters produced a SIM > SEQ pattern.

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Author Notes

The authors would like to thank Ms. Karen Wilson and the staff of the preschool program of Independent School District 191 (MN) for their cooperation and support in this research project. Appreciation is also extended to the many School Psychology graduate students at the University of Wisconsin-River Falls who assisted in this research.

Table 1

Means, Standard Deviations and Minimum/Maximum Values for MSCA and K-ABC at Time One Testing

	N	Mean	Standard Deviation	Range
MSCA				
GCI				
Repeaters	8	67.00	15.82	50- 96
Nonrepeaters	20	86.05	11.78	61-109
PP				
Repeaters	9	75.22	14.25	57-103
Nonrepeaters	22	88.05	11.33	70-117
Quantitative				
Repeaters	9	80.22	15.53	60-102
Nonrepeaters	20	83.50	9.25	68- 97
Verbal				
Repeaters	8	73.63	11.70	57- 94
Nonrepeaters	20	89.40	12.01	72-121
Memory				
Repeaters	8	75.50	16.25	54- 98
Nonrepeaters	21	83.62	11.25	62-113
Motor				
Repeaters	6	73.00	14.63	56- 90
Nonrepeaters	20	85.80	12.25	67-104

K-ABC				
MPC				
Repeaters	13	76.15	4.39	66- 83
Nonrepeaters	27	91.41	7.26	81-110
SEQ				
Repeaters	13	80.31	8.06	69- 93
Nonrepeaters	27	91.26	8.29	76-108
SIM				
Repeaters	13	77.54	5.72	68- 86
Nonrepeaters	27	93.41	9.68	75-121
ACH				
Repeaters	13	80.54	9.11	59- 97
Nonrepeaters	27	94.74	11.49	76-119

Note. GCI = General Cognitive Index; PP = Perceptual/Performance; Q = Quantitative; MPC = Mental Processing Composite; SEQ = Sequential Processing; SIM = Simultaneous Processing; ACH = Achievement.

Table 2

Means, Standard Deviations and Minimum/Maximum Values for the K-ABC at Time Two Testing

	N	Mean	Standard Deviation	Range
MPC				
Repeaters	13	80.77	9.41	60-100
Nonrepeaters	27	99.44	7.42	86-114
SEQ				
Repeaters	13	82.08	11.00	56-100
Nonrepeaters	27	93.85	10.00	81-119
SIM				
Repeaters	13	83.31	10.93	68-101
Nonrepeaters	27	104.30	7.87	89-119
ACH				
Repeaters	13	80.62	10.63	51- 98
Nonrepeaters	27	98.63	9.99	82-122

Note. MPC = Mental Processing Composite; SEQ = Sequential Processing; SIM = Simultaneous Processing; ACH = Achievement.

Table 3

Performance Patterns on the Global Scales of the K-ABC by Group

	SEQ > SIM		SIM > SEQ		SIM = SEQ	
	n	%	n	%	n	%
Time 1						
Repeaters	2	15	1	7.5	10	77.5
Nonrepeaters	4	15	5	18.5	18	66.5
Time 2						
Repeaters	3	23	3	23	7	54
Nonrepeaters	3	11	14	52	10	37

Note. Time 1 testing occurred in September of the academic year and Time testing occurred in May of the same academic year.

Table 4

K-ABC Global Scale Stability by Group

	Repeaters n = 13	Nonrepeaters n = 27
MPC 1/MPC 2	.91 (.95)	.50 (.64)
SEQ 1/SEQ 2	.79 (.85)	.43 (.55)
SIM 1/SIM 2	.73 (.83)	.55 (.67)
ACH 1/ACH 2	.88 (.92)	.79 (.84)

Note. MPC 1, SEQ 1, SIM 1, ACH 1 refer to scores at Time 1 testing in September and MPC 2, SEQ 2, SIM 2, ACH 2 refer to scores at Time 2 testing in May. Coefficents in parentheses have been corrected using Guilford's (1954) formula. All correlations are significant ($p < .001$).