DOCUMENT RESUME

ED 124 597 95 TM 005 357

AUTHOR Rubin, Rosalyn A.; And Others
TITLE Accuracy of Preschool Identification of Potential Learning Disabilities.
SPONS AGENCY National Inst. of Education (DHEW), Washington, D.C.
PUB DATE [Apr 76]
GRANT OEG-32-33-0402-6021
NOTE 13p.; Paper presented at the Annual Meeting of the American Educational Research Association (60th, San Francisco, California, April 19-23, 1976)
AVAILABLE FROM Rosalyn A. Rubin, University of Minnesota, Minneapolis, Minnesota 55455

EDRS PRICE MF-$0.83 Plus Postage. HC Not Available from EDRS.
DESCRIPTORS Academic Achievement; Achievement Tests; Classification; *Correlation; Early Childhood Education; Grade 2; Grade 3; Identification; *Learning Disabilities; *Predictive Ability (Testing); Predictive Validity; Preschool Children; Preschool Education; Preschool Evaluation; Preschool Tests; *School Readiness Tests; Sex Differences; Standardized Tests; *Test Results
IDENTIFIERS *Metropolitan Readiness Tests; *Stanford Achievement Test

ABSTRACT

Relationships between performance on two preschool administrations of the Metropolitan Readiness Tests (MRT) and Stanford Achievement Test (SAT) scores at age nine were examined for a sample of 732 children. Significant correlations, ranging from .50 to .71, were obtained between readiness scores and SAT scores on reading, spelling and arithmetic. However, when subjects were classified into high and low groups on readiness and on achievement variables it was found that far greater reliance could be placed on use of high readiness scores as predictors of good academic performance than on use of low readiness scores as predictors of poor performance. (Author)

ACCURACY OF PRESCHOOL IDENTIFICATION OF POTENTIAL LEARNING DISABILITIES

Rosalyn A. Rubin, Bruce Balow;
Jeanne Dorle and Martha Rosen

University of Minnesota

Paper presented at the Annual Meeting of the American Educational Research Association in San Francisco, April 1976.

Abstract

Accuracy of Preschool Identification
of Potential Learning Disabilities

Rosalyn A. Rubin, Bruce Balow,
Jeanne Dorle and Martha Rosen

University of Minnesota

Relationships between performance on two preschool administrations of the Metropolitan Readiness Tests (MRT) and Stanford Achievement Test (SAT) scores at age nine were examined for a sample of 732 children. Significant correlations, ranging from .50 to .71, were obtained between readiness scores and SAT scores on reading, spelling and arithmetic. However, when subjects were classified into High and Low groups on readiness and on achievement variables it was found that far greater reliance could be placed upon use of High readiness scores as predictors of good academic performance than upon use of Low readiness scores as predictors of poor performance.

ACCURACY OF PRESCHOOL IDENTIFICATION OF POTENTIAL LEARNING DISABILITIES[1]

Rosalyn A. Rubin, Bruce Balow,
Jeanne Dorle and Martha Rosen

University of Minnesota

The purpose of the present study is to determine the extent to which children identified on preschool readiness tests as "high risk" for development of learning difficulties do, in fact, demonstrate disabilities in basic subject matter areas by the time they have completed two to three years of elementary school.

Although in most states the minimum age for compulsory schooling is 6 or 7 years, there is a growing movement toward lowering the age at which schools start serving children. In 11 states, some or all handicapped children become eligible for school services at birth, and at age 3 in 14 states (Trudeau, 1972). The Council for Exceptional Children (1971) has recommended that "schools should actively seek out children who may have specilaized educational needs in the first years of their lives" (p. 3).

Extending preschool services to learning disabled children immediately raises the problem of identifying such children. A number of researchers have addressed this question; a recent review (Keogh & Becker, 1973) cited 9 studies which attempted to locate potentially learning-disabled children in kindergarten or earlier. In 8 of these studies correlation coefficients

[1] The research reported herein was performed pursuant to a grant (OEG-32-33-0402-6021) from the National Institute of Education, Department of Health, Education and Welfare.

between preschool and elementary school test performance were reported with coefficients as low as .22 and as high as .75 found to be significant. Only 4 studies reported the percentage of correct predictions made for various groups. Educational practitioners frequently use a child's performance on preschool measures to determine whether or not that child is "at risk" for having future learning disabilities. Educators who are currently classifying children as "at risk" or "not at risk" based on their performance on such preschool measures may be making unwarranted assumptions regarding validity of predictions for individual children based on magnitude of correlation coefficients between preschool predictor and educational outcome measures. The present study describes the relationship between significant correlation coefficients and the accurate prediction of individual success or failure.

Data source

The 732 subjects in the present investigation were drawn from among the 1559 participants in the Educational Follow-Up Study (EFUS)(Balow, et al, 1969), a prospective longitudinal investigation of the educational and behavioral outcomes associated with perinatal and early childhood conditions and events. EFUS subjects were born at the University of Minnesota Hospitals over a five-year period during the 1960's and are normally distributed on measures of IQ. EFUS subjects were administered the Metropolitan Readiness Tests (MRT) at age five, during the summer prior to kindergarten entrance, and again at age six prior to entering first grade. The Word Meaning, Spelling, and Arithmetic Computation sections of the Stanford Achievement Test were individually administered during the summer of the calendar year in which subjects reached their ninth birthday. At the time

of the SAT testing, 212 (29.0%) of the subjects had completed grade 2 and 520 (71.0%) of the subjects had completed grade 3. All EFUS subjects who had been administered the MRT at both ages five and six as well as the SAT at age nine at the time these data were collected were included in the present study.

Methods and techniques

Correlations between scores on the MRT and each of the three subtests of the SAT were first computed separately for the five and six year MRT performances. MRT scores from the two administrations were then combined in a multiple regression prediction of the SAT subtest scores. For the second part of the analysis subjects were classified into "High" and "Low" groups on each of the MRT tests and on each of the three SAT subtests.

According to the Manual of Directions for the MRT children entering first grade who obtained a raw score below 45 are "likely to have difficulty in first grade work." The 172 (23.5%) of our study subjects who obtained raw scores of 44 or below at the time of the pre-first grade testing were therefore classified as members of the "Low" group on that measure.

Since the MRT manual does not provide norms for children entering kindergarten, children were classified in the "Low" group on this measure if they scored within the lower 24% (n=178) of our study sample (raw score below 22) thereby generating "Low" groups of approximately equal size at both pre-kindergarten and pre-first grade levels.

Low groups on each of the SAT subtests consisted of subjects who scored at least one year below their actual grade placement. High groups were composed of the remaining subjects. On the Word Meaning subtest 137 (18.8%) of the study subjects were classified in the Low group, on the Spelling

subtest 185 (25.3%) of the study subjects fell into the Low group, and on Arithmetic Computation 254 (34.7%) of the study subjects scored one or more grade levels below their actual grade placement. The High groups on the Word Meaning, Spelling, and Arithmetic Computation tests consisted of 595, 547, and 478 subjects respectively.

Results and conclusions

Table 1 about here

The pre-kindergarten MRT correlated .62 with SAT Word Meaning, .52 with SAT Spelling, and .51 with SAT Arithmetic Computation. The pre-first grade MRT scores correlated .66 with Word Meaning, .56 with Spelling, and .55 with Arithmetic Computation. When the two MRT scores were combined in multiple regression equations to predict SAT subtest scores, the resulting multiple correlations were .71 for Word Meaning, .60 for Spelling, and .58 for Arithmetic Computation. Both the individual and the multiple correlations predicting achievement outcomes from MRT performance compare favorably with the predictive correlations between pre-school screening instruments and later school achievement outcomes obtained by previous researchers (Bagford, 1968; Scott, 1970).

Table 2 about here

As shown in Table 2 males were more likely than females to be classified as Low on each of the measures included in this study. On the MRT 110 (29.9%) of the males and 68 (18.7%) of the females were classified as Low on the

pre-kindergarten test while 93 (25.3%) of the males and 79 (21.7%) of the females were classified as Low on the pre-first grade test. On the Stanford measures Low classifications were obtained by 75 (20.4%) of the males and 62 (17.0%) of the females on Word Meaning, by 110 (29.9%) of the males and 75 (20.6%) of the females on Spelling, and by 136 (37.0%) of the males and 118 (32.4%) of the females on Arithmetic Computation.

Table 3 about here

Of the 92 subjects who were classified in the "Low" groups on both the pre-kindergarten and pre-first grade Metropolitan tests, 47 (51%) were classified in the Low group on the Word Meaning test, 46 (50%) were classified in the Low group on Spelling, and 46 (50%) were classified in the Low group on Arithmetic Computation. The SAT classifications of both males and females could be predicted with equal accuracy for those subjects who were Low on both MRT measures.

Of the 166 subjects with Inconsistent classifications, who were classified in the Low group on only one of the MRT administrations, 54 (32.5%) were found in the Low group on the Word Meaning test, 57 (34%) were in the Low group on the Spelling test, and 91 (54%) were in the Low group on the Arithmetic Computation test. More males (91) than females (75) received "Inconsistent" classifications; however, of those who did fall in this category, females were more likely than males to be classified in the Low group on the Stanford achievement measures.

474 subjects were classified in the High group on both of the MRT administrations. Of these, 436 (92.0%) were in the High group on Word

Meaning, 393 (82.7%) were in the High group on Spelling, and 358 (75.3%) were in the High group on Arithmetic Computation. Of those with consistently High MRT classifications, females were more likely than males to be classified in the High group on Stanford Spelling and Arithmetic Computation, while there was no sex difference on the Word Meaning test.

Educational importance of the study

These findings indicate that correlations in the .50's, .60's, and even as high as .70 between scores on predictor and outcome variables do not justify the assumption of consistency of performance for low-scoring children. Thus, poor preschool test performance may not provide sufficient information on which to base decisions regarding classification of individual children into High Risk groups and/or assignment of children to special programs of intervention.

It is apparent that far greater reliance can be placed upon use of high preschool readiness scores as predictors of good academic performance than upon use of low preschool readiness scores as predictors of poor performance. Of those subjects classified in the High group on both preschool test administrations, from 75% to 92% were found to rank in the High groups on standardized measures of reading, spelling, and arithmetic administered three years later. However, of the subjects consistently classified in the Low group on the same preschool tests, only 50% were found in the Low groups on the three outcome variables. Of the subjects classified in the Low group on only one preschool test from 45% to 67% were later classified in the High groups.

Base rate data such as herein reported regarding consistency of classification based on early test performance are needed in assessing the efficacy of

early intervention programs and in helping to prevent the confounding of the effects of home and regular school learning experiences with the effects of specific intervention techniques.

References

Bagford, J. Reading readiness scores and success in reading. Reading Teacher, 1968, 21, 324-328.

Balow, B., Anderson, J., Reynolds, M., & Rubin, R. Educational and behavioral sequelae of prenatal and perinatal conditions. (USOE, BEH, Project No. 6-1176, Interim Report No. 3) Department of Special Education, University of Minnesota, September 1969.

The Council for Exceptional Children. Basic commitments and responsibilities to exceptional children and policy statement on government affairs. Arlington, Va.: Author, 1971.

Keogh, B. K., & Becker, L. D. Early detection of learning problems: Questions, cautions, and guidelines. Exceptional Children, 1973, 40, 5-11.

Scott, R. Perceptual skills, general intellectual ability, race, and later reading achievement. Reading Teacher, 1970, 23, 660-668.

Trudeau, E. (Ed.). Digest of state and federal laws: Education of handicapped children. (2nd ed.). Arlington, Va.: The Council for Exceptional Children, 1972.

Table 1

Correlations between
Metropolitan Readiness Test (MRT) Scores and
Stanford Achievement Test (SAT) Scores for 732 Subjects

	SAT		
	Word Meaning	Spelling	Arith. Comput.
Pre-Kindergarten MRT	.62	.52	.51
Pre-First MRT	.66	.56	.55
Multiple R (Pre-K MRT and Pre-1st MRT)	.71	.60	.58

Table 2

Metropolitan Readiness Tests and Stanford Word Meaning, Spelling and Arithmetic Classifications by Sex

Measures	Males N	Males %	Females N	Females %	Total N
Pre-K MRT					
High	258	70.1	296	81.3	554
Low	110	29.9	68	18.7	178
Pre-1st MRT					
High	275	74.7	285	78.3	500
Low	93	25.3	79	21.7	172
Stanford Word Meaning					
High	293	79.6	302	83.0	595
Low	75	20.4	62	17.0	137
Stanford Spelling					
High	258	70.1	289	79.4	547
Low	110	29.9	75	20.6	185
Stanford Arithmetic					
High	232	63.0	246	67.6	478
Low	136	37.0	118	32.4	254

Table 3

Classification of 732 Subjects on the Basis of Pre-Kindergarten and Pre-First Grade Metropolitan Readiness Test Performance and Stanford Achievement Test Performance at Nine Years

Metropolitan Readiness Test Scores	Males					Females					Total				
	Low		High		Total	Low		High		Total	Low		High		Total
	N	%	N	%		N	%	N	%		N	%	N	%	
Stanford Word Meaning															
Consistently Low	28	(50)	28	(50)	56	17	(47)	19	(53)	36	45	(49)	47	(51)	92
Inconsistent[1]	28	(31)	63	(69)	91	26	(35)	49	(65)	75	54	(32)	112	(68)	116
Consistently High	19	(9)	202	(91)	221/368	19	(8)	234	(92)	253/364	38	(8)	436	(92)	474/732
Stanford Spelling															
Consistently Low	28	(50)	28	(50)	56	18	(50)	18	(50)	36	46	(50)	46	(50)	92
Inconsistent[1]	28	(31)	63	(69)	91	29	(39)	46	(61)	75	57	(34)	109	(66)	166
Consistently High	54	(24)	167	(76)	221/368	28	(11)	225	(89)	253/364	82	(17)	392	(83)	474/732
Stanford Arithmetic Computation															
Consistently Low	28	(50)	28	(50)	56	18	(50)	18	(50)	36	46	(50)	46	(50)	92
Inconsistent[1]	46	(50)	45	(50)	91	45	(60)	30	(40)	75	91	(54)	75	(45)	166
Consistently High	62	(28)	159	(72)	221/368	55	(22)	198	(78)	253/364	117	(25)	357	(75)	474/732

[1]Either Low-High or High-Low