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ABSTRACT

The findings of a 3-year longitudinal research study to investigate predictive instruments for beginning reading achievement are reported. The original sample consisted of 300 kindergarten children from three socioeconomic attendance areas in the Cheyenne, Wyoming, public schools. For the final evaluation at the end of grade 2, only those pupils who had complete data on all prediction variables were retained in the study. The predictor variables for total group first-grade achievement found to be significant at or above the .05 level were sex, mother's education, teachers' predictions, reading percentile, the Numbers and Matching subtests of the Metropolitan Readiness Tests, the Visual 3 subtest of the Gesell Developmental Tests, Complete-a-Man, and the Digit Span subtest of the Wechsler Intelligence Scale for Children (WISC). For second-grade total group achievement, the predictor variables were teachers' predictions, socioeconomic status, reading raw score, teachers' see peer rating, and the Information subtest of the Metropolitan. Predictor variables for sex and for socioeconomic levels also are reported. Results of the WISC indicated that the Full Scale, Verbal, and Performance IQ scores were not significant predictors of reading success. Tables are included. (CM)

PREDICTION OF READING SUCCESS*

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*The research reported herein was performed pursuant to a contract with the United States Department of Health, Education, and Welfare, Office of Education.

PREDICTION OF READING SUCCESS*

This presentation has two major objectives: (1) to report on a three-year longitudinal research study in reading prediction and (2) to report on the pitfalls and dead ends discovered during the progress of the study.

Recognition of the need to strengthen reading programs in the national interest and to assist the development of each individual is evident among educators and the general public. Research has concentrated on identifying, after the fact, causes of reading disability. More recently, predictive studies have attempted to identify potential disability cases. Much research has concentrated on the utilization of a narrow range of instruments and techniques or small experimental groups for short periods of time to predict or identify reading failures.

Objectives of the Longitudinal Study

1. Predict reading success as well as failure.

2. Determine from past research and experience the most promising instruments for prediction of reading achievement.

3. Combine from each instrument the best predictive variables to compute a regression equation which would be both statistically and socially significant.

4. Follow the same subjects through three years of school pre-reading and learning-to-read experiences.

5. Use a representative sample so findings could be generalized to a national populations of school children.

Selection of the Sample

Three hundred kindergarten children from nine schools of Laramie County, Cheyenne, Wyoming, School District No. 1, were selected for this intensive three-year study. Schools were selected on the basis of socioeconomic district attendance areas. The groups showed significant differences in factors usually associated with the three socioeconomic groupings.

This size sample was initially drawn because District No. 1 has a mobile

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population. For the final evaluation at the end of second grade, only those pupils who had complete data on all prediction variables were retained in the study.

Statistical tests were computed to determine if the pupils lost from the study were comparable to those remaining. The pupils remaining in the study were comparable to those lost.

Variables commonly used in predicting reading success include; chronological age, intelligence test scores, readiness tests, socioeconomic status and sex. Combinations of other variables have used physical and emotional maturity, visual perceptual abilities, creativity, and stage of maturational development.

Measuring instruments were used which were designed to identify and make possible a determination of the relationships between these predictive variables and reading achievement in the first and second grades.

Summary of Results

Results of this research tend to indicate that educational and administrative school personnel, as well as parents, should question some of the basic assumptions concerning variables such as IQ and chronological age as valid predictors of success in primary school. Further consideration should be given to the skills that are tapped by certain portions of readiness tests.

The significant relationship between beginning reading and the Numbers subtest of the Metropolitan Readiness Test was highlighted. A review of the literature indicates that previous research has failed to note the importance of this relationship between Numbers and success in reading. The Numbers subtest appeared, in this study, to measure skills needed for reading more effectively than did the reading readiness subtests.

Results of the WISC indicated that the Full Scale, Verbal, and Performance IQ scores were not significant predictor variables of either first or second grade reading success. Digit Span, though, was a significant predictor for upper socioeconomic children in second grade reading success.

This study tends to indicate that pattern analysis of the WISC is inappropriate for diagnosis of primary reading achievement. Rather, a global research approach appears to be necessary.

Results of this study tend to indicate that teachers' predictions of future success in school are amazingly accurate, especially for those of the lower socioeconomic group who fail. A teacher's prediction of reading success, made while the subject was in kindergarten, was a significant predictor of first and second grade reading success. A simple statement of the teacher's prediction of reading achievement of the subject is all that is necessary; more complicated forms add no sensitivity to the measuring scale. A question this research cannot answer concerns what factors teachers take into account when they make predictions of reading success. Do these predictions relate to the teacher's knowledge of the correlation between a child's academic success and his family background? It is

possible that the ability of teachers to predict the achievement of children in low socioeconomic groups may be a function of these children fulfilling teacher and peer expectations. Perhaps the predictions are a self-fulfilling prophecy. Teachers may be reading accurately the role society is creating for lower socioeconomic children.

Results of the Minnesota Nonverbal Test of Creativity indicate that creativity scores may be of small value in predicting primary school achievement though the Titles score was a significant predictor of male first grade reading success. Perhaps we are asking the wrong question of creativity tests to ask for academic prediction in today's classrooms.

On the Gesell Developmental Test, Visual 3 was a significant predictor of first grade reading success for the total group and for males.

Physical Skills findings indicated that the Bend, Touch, and Twist subtest was the only predictor variable which was significant. These findings were predictive only of reading success among lower socioeconomic children in the second grade. The relationship was negative.

Sociometric findings showed that "Seen in Positive Role" was a significant predictor variable of reading success of second grade lower and upper socioeconomic children.

Significant findings from demographic variables were the lack of significance between chronological age and success in reading achievement for the total group or any sub-population in first or second grade. Sex was a significant predictor of first grade reading success, while education of mother was a significant predictor of female and the total group first grade reading success.

Significance of the Findings

1. Only a few parts of the many tests and evaluative measures were found to be statistically and socially significant. Yet thousands of pupils are labeled each year from the results of each of these tests and evaluative measures. Though a test may be widely acclaimed for its predictive value, there is reason to question this assumption.

2. Beginning reading skills may be developed through an experience hierarchy with the development of perceptual and symbolic skills. Comparable skills of both males and females need to be measured and in the same order. This is difficult because different tests are necessary for valid measurement of sex-related skills.

3. The training of teachers should be expected to determine if it is possible to train teachers to recognize self-fulfilling prophecies whether those prophecies stem from the general or school culture.

Pitfalls

No one wants to reinvent the wheel and researchers survey past work for leads upon which to build. Significant points may be overlooked. For example, first we failed to note a seemingly minor detail of the relationship between the Numbers subtest and reading achievement. Do not assume

the test title tells what is tested. When the relationship appeared in this study, we rechecked again to determine if it had shown before. The same thing happened with the relationships between IQ scores and beginning reading and with chronological age and beginning reading. Challenge basic issues, look at the problem and see accumulated data in a new light.

To avoid a second pitfall anticipate all needed data. Much cannot be retrieved at a later date. System scores may be presented in forms other than raw scores and special arrangements must be made to insure survival of the data. Tests not administered at a specified point in time cannot offer answers at the end of the study.

Unnecessary work may be eliminated if the research design is carefully formulated and consultants utilized at the appropriate time. For example, first we analyzed the data by the total group, by the sex groups, and by the socioeconomic groups. A consultant asked the obvious question. Why not enter sex and socioeconomic status as variables in the regression analysis to determine what analysis was significant.

Old hypothesis die hard. Do not get emotionally attached to a particular hypothesis. As a study progresses, often new avenues open which point the way to a more global approach. Though this study was first thought of a a method to find the relationship between specific IQ factors and reading, the study soon became much more comprehensive.

One added pitfall. Researchers are eager to find possible answers to their questions. Sometimes they are not so eager to disseminate that information. Practical utilization and follow up can be accomplished only if others are aware of what has been accomplished. Let us not keep educational research somewhat hidden as though we are not quite sure of its professional acceptance. It is coming of age and will be recognized.

FIRST GRADE ACHIEVEMENT PREDICTOR VARIABLES*

TOTAL GROUP

(N = 226)

READING

Variable	Mean	S.D.	M.R.	R^2
Numbers (Metropolitan)	14.19	4.58	.63	.40
Teachers'Predictions	2.18	1.08	.69	.48
Matching (Metropolitan)	11.60	3.96	.72	.52
Sex	1.50	.50	.74	.55
Education of the Mother	11.57	3.38	.75	.57
Complete-A-Man	8.00	1.15	.76	.58
Visual 3	6.44	2.02	.77	.60
Digit Span	9.99	3.24	.78	.60
Reading Percentile	64.26	27.36		

SECOND GRADE ACHIEVEMENT PREDICTOR VARIABLES*

TOTAL GROUP

(N = 188)

READING

Variable	Mean	S.D.	M.R.	R^2
Teachers'Predictions	2.31	1.04	.45	.20
Socioeconomic Status	2.05	.74	.57	.33
Teachers'See Peer Rating	2.44	.83	.60	.36
Information (Metropolitan)	9.34	2.86	.61	.38
Reading Raw Score	39.79	9.60		

*Predictors Significant at or above the .05 level.

FIRST GRADE PREDICTOR VARIABLES*

Male

(N = 114)

READING

Variables	Mean	S.D.	M.R.	R^2
Numbers (Met.)	13.4	4.5	.68	.46
T. P.	2.0	1.1	.72	.52
Titles	26.4	14.1	.75	.56
Matching (Met.)	10.8	3.9	.77	.60
Visual 3	6.3	2.1	.79	.62
Reading Percentile	55.6	28.3		

Female

(N = 112)

READING

Variables	Mean	S.D.	M.R.	R^2
T. P.	2.4	1.0	.59	.35
Information (Met.)	9.4	2.9	.67	.44
Education Mother	11.8	3.4	.70	.49
Matching (Met.)	12.5	3.8	.73	.53
C. A. Man	8.1	1.0	.74	.55
Reading Percentile	73.1	23.4		

*Significant at or above the .05 level.

SECOND GRADE ACHIEVEMENT PREDICTOR VARIABLES*

LOWER SOCIOECONOMIC GROUP

(N = 43)

READING

Variable	Mean	S.D.	M.R.	R^2
Teachers See Peer Rating	2.37	.72	.58	.33
Physical Skills	8.84	1.38	.65	.42
Arithmetic (WISC)	9.26	2.77	.69	.48
Teachers' Predictions	1.88	.96	.71	.51
Sociometric Positive Role	6.35	6.97	.74	.55
Reading Raw Score	31.49	10.98		

SECOND GRADE ACHIEVEMENT PREDICTOR VARIABLES*
MIDDLE SOCIOECONOMIC GROUP

(N = 90)

READING

Variable	Mean	S.D.	M.R.	R^2
Matching (Metropolitan)	11.63	3.68	.44	.19
Teachers' estimate of social growth	2.34	.95	.48	.23
Reading Raw Score	41.78	7.92		

UPPER SOCIOECONOMIC GROUP

(N = 55)

READING

Variable	Mean	S.D.	M.R.	R^2
Digit Span (WISC)	10.91	3.10	.53	.28
Sociometric Positive Role	10.65	14.25	.58	.33
Reading Raw Score	42.93	7.15		

*Significant at or above the .05 level.