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SOME VARIABLES INVOLVED IN THE READING PROCESS

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Chapter 1

INTRODUCTION AND REVIEW OF THE LITERATURE

Children are introduced to reading by numerous pro-
cesses which are based on various philosophies, research,
and opinions. The end result of these diverse processes,
ranging from personal opinions to published reading series,
is questionable as reflected by the fact that a number of
these children either do not learn to read at all or at best
learn to read only at a minimal level.

In some of the schools that provide remedial reading
programs for the nonreader, a variety of instructional
methods are used in an attempt to validate the significance
of these various teaching methods. In some instances, how-
ever, no type of remedial program is available to children
needing such help.

Teachers most often use the best known and commonly ac-
cepted methods to teach a child to read yet there is little
research available to substantiate the extent of the valid-
ity of some of these techniques. It is one of these tech-
niques, the rhyming process, with which this investigator
is particularly concerned.

Children from their early to middle years are bombarded
with rhymes. Teachers devise rhyme games and songs to

capture the child's attention and sharpen his desire to learn. Publishers write programs which educators incorporate into their recommendations for the teaching of reading. In view of the pervasiveness of the rhyming process as a teaching tool, this study is concerned with investigating the process, its relationship to the child's learning to read, and its relationship to various other aspects of the child's intellectual development. This is an effort to determine the feasibility of the many hours spent in the schools by both the teachers and the children in working with rhyming techniques.

In Gray's 1948 review of various methods of teaching reading, he includes the following quotation, being taken from the 1916 edition of the Aldine Primer which was originally copyrighted in 1907:

> . . . prominent features of this method are the rhymes . . . and the teacher-pupil stories.
>
> The rhymes . . . are to be memorized thoroughly. They furnish nearly all the words used in the book. Experience proves that pupils acquire an initial stock of sight words much more quickly and easily through memorizing of rhymes than through the object, word, or sentence methods. The chief value of memorizing the rhymes consists in the power that it gives the pupil to help himself to read independently . . . (page 24).

This is illustrative of the prevalence of educational think-
ing as early as 1907 that rhyming was a valuable process in
teaching children to learn to read.

The technique of using rhymes was not limited to the
word-method. In the phonic approach to reading, various
letters and sounds of words are introduced to the children
before the technique of rhyming is introduced. "The Gordon
Readers" as surveyed by Gray (1948), provide an example of
the procedure used for the "Blending of initial Consonant"
using the phonic method. This process involves the over-
lapping of initial letters to form new words, each with the
same base rhyme unit.

Then these readers suggest an alternate technique where-
by the initial consonant is combined with various rhyme
units, families of words. The teacher presents to the chil-
dren these word groups in rapid succession. The teacher is
directed to maintain the interest level of the children by
commenting on the words as they are presented and by relat-
ing the words to the environmental knowledge of the children
(Gray, 1948). In both The Children's Method Reader (1918)
and the Moore-Wilson Readers (1927) the "families" approach
to the rhyming of words was used (Gray, 1948).

During the 1920's rhyming or any other type of word
analysis was not felt to be either necessary or justifiable.
However, the school began a technique which required the
child to guess words from context. The mode of thinking

shifted, and in the 1930's emphasis was placed on controlled vocabularies and the high interest content of reading series, particularly in the lower grades. After these various changes in the reading series, once again word analysis became an important factor in the teaching process, and rhyming methods were used extensively.

Later on as new approaches to reading were introduced rhyming continued to be an integral part of the teaching process. In teaching reading today, Heilman (1961) concludes that the clue is not the word per se but rather the sound of the word in conjunction with the sounds of various initial letters: "w, h, f...". By association of the sound with the initial letters, children can grasp word families earlier, thus learning to read sooner. As previously stated, rhyming was used in both word method and phonic methods, with the new "story method" in the form of Mother Goose rhymes being reintroduced in 1915 (Bray, 1948).

Teachers cannot teach a child to use word attack skills until the child can compare word forms, noting the essential likenesses and differences. Gray concludes that the process is not related merely to the child's visual perception of the structural analysis but must include the child's internal analysis of the phonetics of similar sounding words. When the child attacks an unfamilar word in the process of reading, Gray believes that the child must think of this word as being like a rhyming word with which he is

already familiar, the difference being a new beginning

sound (Gray, 1948). Many times, as an aid to the child's

perception and understanding, the mental rhyming of words is

a necessary process. The child must be able to identify the

sounds that are used in language and the symbols that repre-

sent such sounds (Gray, 1948). Also Gray observed that in

the early stages of learning to read, it is essential that

the visual symbol be encountered by the child only after the

word has been made a part of his speaking-meaning vocabu-

lary. The child must call up a mental picture of the printed

form of the word in order to compare the two word forms,

such as: "game - name - same - came." The use of this tech-

nique focuses the child's attention on complete pronounciable

units rather than on isolated vowel-consonant combinations

(Gray, 1948). Rhyming concepts are used in consonant sub-

stitution, combining simple structural and phonetic analysis.

Gray (1948) lists eight procedures to help the teacher

promote ability in auditory perception of rhyme. These pro-

cedures help to create the basis for more difficult phonetic

analysis (the fourth level in the sequential program of five

levels necessary to the preparation for the process of

reading). These eight procedures are as follows:

> a. Display pictures of a cat and a hat (or
>
> two other pictures whose names rhyme) and say
>
> the name as each picture is indicated. Have the
>
> children repeat the names several times as the

pictures are displayed separately and bring their attention to the fact that <u>cat</u> and <u>hat</u> end with the same sound. Explain that we say these two words rhyme because they sound alike except at the beginning. . . . Repeat this procedure with other pairs of pictures, the majority of which represent rhyming words.

b. Read aloud jingles in which the rhyme is quite apparent. Call attention to the rhyming words and encourage children to suggest other words that rhyme with them.

c. Present orally sets of three words, two of which rhyme . . . and ask children to tell which words in each set rhyme.

d. Write such a word as <u>run</u> on the blackboard and pronounce <u>fun</u> and <u>play</u>, asking the children to tell which rhymes . . .

e. Before reading a jingle . . . ask the children to see if they can hear words that rhyme . . .

f. Write an unfinished couplet on the blackboard. . . . Ask the children to read the lines silently and think of some word that will finish the rhyme . . .

g. Distribute copies of boxed pictures, including in each box a word that rhymes with

one of the pictures . . . underline the picture whose name rhymes with the word.

h. Write a sentence about a story the children have been reading and ask them to supply a rhyming line that will complete the idea as told in the story . . .

As children grow in their ability to identify . . . the sound of rhyming and non-rhyming words, the teacher should . . . give specific guidance to promote accurate auditory perception of . . . single consonant sounds . . . (page 139-140).

It is notable in the above quote that the children are reading words and doing some writing, yet rhyming is still being stressed before any of the other types of word attack skills.

In outlining a developmental program of word-analysis activities Russell (1961) suggests that during the reading readiness level of the child, he should listen to and say nursery rhymes and rhyming words. At the preprimer level, he should reproduce rhymes and rhythms and give rhyming word responses; at the primer level he should be able to complete and compose rhymes. Like Russell, McKee (1948) suggests that the technique of rhyming should be a fundamental part of the curriculum plans in teaching the first grade child to read.

Similarly, Monroe (1951) states that during the pre-reading period, children should learn to listen carefully to the sounds of words, to be aware of rhyming words, and to discriminate between sounds as preparation for later levels of reading. Monroe feels that the child needs a conditioned auditory judgement in order to make the correct selection of a rhyming word from words previously stated. She recommends the continuation of auditory discrimination training until the child can give a list of three or four rhyming words whenever the teacher begins the list and asks him to continue it. To reinforce the auditory learning, Monroe suggests visual stimulation by use of pictures of objects whose names rhyme with each other. The child is then asked to select the ones which rhyme. A variation of this procedure calls for the child to select the picture of an object whose name rhymes with the teacher's spoken word.

Rhyming is a key skill in the intellectual development of the child as evidenced by its inclusion in various tests of reading readiness and intellectual ability. In the Gates Reading Readiness Test a rhyming test is included, 25% of the total score being taken from this one subtest. Instead of the rhyming test, the test examiner may use the optional test on reading letters and numbers. The Gates Reading Diagnostic Test uses rhyming words in testing for auditory perception with the stated final sound requiring three rhyming responses for each stimulus word. Gates's

rationale for use of the rhyming test is based on the fact
that the most common type of play activity involving the
sounds of words centers around rhyming words. Gates's
theoretical position is that the more proficient the pupil
is with final or rhyming elements of words the more able
he is to deal with other more complicated word components.
As a means of presentation to the child, he suggests the
repetition of rhyming words in unison and individually,
emphasis being placed on the unit of rhyme. Children should
learn to complete rhymes and make up jingles of their own,
perhaps by being given a word orally and encouraged to think
of as many additional words as possible which contain the
same rhyming unit. Verse, poetry, and rhymes as found in
songs and other rhymthmic materials are techniques which
the teacher may employ with the intermediate grades in
order to make the rhyming process more appropriate to the
age of the child and his interests.

Some of the newer reading series are again emphasizing
the rhyming technique in the teaching of reading, with one
of the new approaches written by Engelmann-Bruner (1969)
devoting approximately 25% of the child's language arts pro-
gram to rhyming procedures.

Regardless of the mode of teaching reading or its under-
lying philosophy, rhyming has been used either implicitly or
explicitly in each method whether it be the word method ap-
proach, the phonic approach, the basal reader approach, the
story method approach, or one of the newer programmed reading

approaches. The relevance or importance of rhyming in the reading process has been assumed by educators for many years but there has been a lack of research as to the actual value of rhyming to the process of teaching the child to read.

The purposes of this study were: to investigate the relationships between rhyming as measured by the Works Bratner Ability to Rhyme Test (W-BAR) and reading as measured by the Wide Range Achievement Test (WRAT) and to investigate the relationship between performance on the W-BAR and thirty-five commonly known different predictors of academic achievement as measured by subtest scores and total scores on the Marianne Frostig Developmental Test of Visual Perception (Frostig), the Wechsler Preschool and Primary Scale of Intelligence (WPPSI), the Illinois Test of Psycholinguistic Abilities (ITPA), and the Metropolitan Readiness Test (Metropolitan).

A selected group of fifty-three first grade children was used as subjects. These children were judged to be high risk first graders on the basis of their performance on a battery of tests. This battery of tests was administered by the Oklahoma City Public Schools to ascertain the educational potentiality of each child.

In order to determine the importance of rhyming to reading and to the thirty-five factors involved in the evaluation of academic achievement the following hypotheses were tested:

1. There is a statistically significant relationship between rhyming as measured by the Works-Bratner Ability to Rhyme Test (W-BAR) and reading as measured by the Wide Range Achievement Reading Test, Level I (WRAT).

2. There is a statistically significant relationship between performance on the (W-BAR) and performance on each of the following tests: Marianne Frostig Developmental Test of Visual Perception (Frostig), the Wechsler Preschool and Primary Scale of Intelligence (WPPSI), the Illinois Test of Psycholinguistic Abilities (ITPA), and the Metropolitan Readiness Test (Metropolitan).

CHAPTER 2

METHOD

Subjects

Fifty-three high risk first graders comprising the total
population of three first grades in the Oklahoma City Public
Schools were individually administered the W-BAR and the
WRAT Reading Test, Level I, by this investigator. The
Oklahoma City Public Schools administered the Frostig, ITPA,
the WPPSI, and the Metropolitan Readiness Test to each
child. Each child was also examined by a pediatrician and
a neurologist who rated them on a one to three scale. The
kindergarten teacher rated each child and also administered
the Draw-a-Person Test. Using the above data, a screening
committee from the school comprised of the pediatrician,
the neurologist, counselors, school psychometrist, kinder-
garten teachers, first grade teachers, director of special
services, and school psychologist selected those children
whom they considered to be high risk first graders.

These children ranged in age from five years and ten
months to six years and ten months. There were 17 girls
and 36 boys in the population.

Standardized Tests

Standardized tests administered were the Frostig, the WPPSI, the ITPA, and the Metropolitan Readiness Test. In addition, this examiner also administered the reading portion, Level I, of the WRAT in May, 1969, for the purpose of ascertaining the reading level of each child at that time.

Experimental Test

The Works-Bratner Ability to Rhyme Test

The subjects were individually administered the W-BAR in May 1969, by the investigator. This test was designed for the purpose of investigating the relationship between rhyming ability and reading acuity. This test was developed by this investigator and Hadros Bratner using the following procedure. Seventy-five pictures of objects familiar to the preschool child were shown one at a time to the total population, 20 preschool children, of the University of Oklahoma Laboratory School, Kindergarten class in the early spring of 1969. The subjects were asked to name the object in each individual picture. Their responses were recorded, only those pictures given the same name by all children were used in the rhyming test. This rhyming test is comprised of 29 cards, each card having four pictures of equal intensity and size depicting objects familiar to preschool children.

In administering the test, the examiner says, "We are going to look at some pictures. I am going to say a word,

and I want you to point to the one picture that sounds the
most like the word I say. Let's try one. See these
pictures." Examiner points to each of the pictures on one
card. "point (or find) the one that sounds the most like
'_____'." Examiner then gives the first of the twenty-
nine stimulus words. To the subject's response, the exam-
iner replies, "Not quite" if the rhyme is missed. "Yes,"
if correct, followed by "_____ would sound most like _____.
The ending _____ in _____ makes it sound like the ending
_____ in _____; only the beginning sound is different."
At this point, the examiner says, "Let's try another one."
Each subject is presented a second card. The forementioned
procedure of presentation is repeated so that the child has
two trials before the actual testing begins. The exact
responses of the subjects and the number of correct re-
sponses in both the preliminary trials and in the actual
tests were recorded by the examiner.

Procedure

The individual tests given in the Oklahoma City Public
Schools were administered by certified counselors trained
to administer these particular tests. The W-BAR and the
WRAT were individually administered by this investigator.
Kendall Rank-Order Correlation (tau) was used to determine
the degree of relationship between performance on the W-BAR
and each predictor of academic achievement, respectively.
Rank order correlation was used because the underlying

assumptions for doing zero-order correlations could not be met. The following formula was used:

$$\tau = \frac{S}{\sqrt{\frac{1}{2}N(N-1) - T_x}\ \sqrt{\frac{1}{2}N(N-1) - T_y}}$$

$$T_y = \frac{1}{2}\ \Sigma t(t-1)$$

$$T_x = \frac{1}{2}\ \Sigma t(t-1)$$

where

  τ = the degree of the relationship between the ranks

  N   = total number of ranks in each column

  S   = sum of the higher ranks less the number of lower ranks

  T_x = number of ties of the W-BAR

  T_y = number of ties of the other academic predictors

This formula was used in that it is robust when the number of tied ranks is large. Therefore the obtained differences between ranks is not spurious due to the unusual number of tied ranks in the test results, the basic assumptions of the formula not being violated.

In addition to the Kendall Rank-Order Correlation, t-tests were used to determine the significance of the correlation between the ranks The following formula was used:

$$t = \frac{\tau}{\sqrt{2(2N+5)/9N(N-1)}}$$

where

    τ = the degree of the relationship between the ranks

    N = total number of ranks in each column

    t = significance of the relationship

In addition to the above tests this investigator also used expectancy tables and chi-square to show the significant differences between the two variables. The scores were divided on the median, and tied median scores were assigned to the appropriate cell by the score of the academic predictor. If both the W-BAR score and the academic predictor score were tied, the scores were assigned randomly. The expectancy tables showing both observed frequencies and expected frequencies are shown in Table C (page 40). The following chi-square formula was used:

$$\chi^2 = \frac{N(AD-BC)^2}{(A + B)(C + D)(A + C)(B + D)}$$

where

    N = the total of all the values in the contingency table

    A = the high scores on both tests

    B = the high score on the W-BAR and low score on the other predictor of academic achievement

    C = the low score on the W-BAR and the high score on the other predictor of academic achievement

    D = the low scores on both tests

Chapter 3

RESULTS AND DISCUSSION

Kendall Rank-Order Correlation coefficients (tau) were
used to test the hypotheses of this study. The data used
in the study were obtained from raw scores of each scale
of the Frostig, the WPPSI, the ITPA, the Metropolitan
Readiness Test, the WRAT Tests, and the W-BAR.

The findings reported in Table I show the relationship
between scores of the Rhyming Test and each of the academic
predictors.

Hypothesis 1, that there is a statistically significant
relationship between rhyming as measured by the W-BAR and
reading as measured by the WRAT Test, Level I, is not sup-
ported by the data.

Hypothesis 2, that there is a statistically signifi-
cant relationship between performance on the W-BAR and the
individual subtests and total scores of the Frostig, WPPSI,
ITPA, and the Metropolitan, is supported. Varying degrees
of support for this hypothesis were found as follows:

a. W-BAR and the Frostig Subtest I, not supported.

b. W-BAR and the Frostig Subtest II, not supported.

c. W-BAR and the Frostig Subtest III, not supported.

    d. The W-BAR and the Frostig Subtest IV, supported beyond the .05 level of statistical significance.

    e. W-BAR and the Frostig Subtest V, not supported.

    f. W-BAR and the total Frostig Test, not supported.

    g. W-BAR and the WPPSI Subtest I, supported beyond the .01 level of statistical significance.

    h. W-BAR and the WPPSI Subtest II, supported beyond the .01 level of statistical significance.

    i. W-BAR and the WPPSI Subtest III, supported beyond the .02 level of significance.

    j. W-BAR and the WPPSI Subtest IV, supported beyond the .05 level of significance.

    k. W-BAR and the WPPSI Subtest V, supported beyond the .02 level of significance.

    l. W-BAR and the WPPSI Subtest VI, not supported.

    m. W-BAR and the WPPSI Subtest VII, not supported.

    n. W-BAR and the WPPSI Subtest VIII, not supported.

    o. W-BAR and the WPPSI Subtest IX, supported beyond the .02 level of significance.

    p. W-BAR and the WPPSI Subtest X, not supported.

    q. W-BAR and the total score of the WPPSI, supported beyond the .01 level of significance.

    r. W-BAR and the ITPA Subtest I, not supported.

    s. W-BAR and the ITPA Subtest II, not supported.

    t. W-BAR and the ITPA Subtest III, supported beyond the .05 level of significance.

    u. W-BAR and the ITPA Subtest IV, not supported.

v. W-BAR and the ITPA Subtest V, supported beyond the .05 level of significance.

w. W-BAR and the ITPA Subtest VI, not supported.

x. W-BAR and the ITPA Subtest VII, not supported

y. W-BAR and the ITPA Subtest VIII, supported beyond the .01 level of significance.

z. W-BAR and the ITPA Subtest IX, not supported.

aa. W-BAR and on the total score of the ITPA, supported beyond the .01 level of significance.

bb. W-BAR and the Metropolitan Test Subtest I, not supported.

cc. W-BAR and the Metropolitan Test Subtest II, not supported.

dd. W-BAR and the Metropolitan Test Subtest III, not supported.

ee. W-BAR and the Metropolitan Test Subtest IV, not supported.

ff. W-BAR and the Metropolitan Test Subtest V, not supported.

gg. W-BAR and the Metropolitan Test Subtest VI, not supported.

hh. W-BAR and on the total score of the Metropolitan Test, not supported.

The previous paragraphs have discussed the relationships found with the W-BAR and Kendall's Rank-Order Correlation. The expectancy tables and the chi square statistics used with the W-BAR and the academic predictors further

TABLE I

Kendall's Rank-Order Correlation Coefficient and t-scores
for the W-Bar and the Test and subtest Scores of
the WRAT, WPPSI, ITPA, and the Metropolitan

Test		N	τ	t
WRAT, Reading Level I		51	.1118	1.1575
Frostig	Test I	47	.0430	.4261
	Test II	47	-.0590	-.5847
	Test III	47	-.0339	-.3359
	Test IV	47	.2236	2.2160*
	Test V	47	-.0085	-.0842
	Frostig Total	47	-.0038	-.0376
WPPSI	Information	53	.2954	3.1226***
	Comprehension	53	.3021	3.1934***
	Arithmetic	53	.2457	2.5972**
	Similarities	53	.2006	2.1205*
	Vocabulary	53	.2400	2.5369**
	Animal House	53	.1666	1.7610
	Picture Completion	53	.0924	.9767
	Mazes	53	.1574	1.6638
	Block Design	53	.2415	2.5528**
	Geometric Design	53	.1432	1.5137
	WPPSI Total	53	.2787	2.9460***
ITPA	Auditory Decoding	53	.0695	.7346
	Visual Decoding	53	.1708	1.8054
	Auditory Vocal Association	52	.2144	2.2426*
	Visual-Motor Association	53	.1271	1.3435
	Vocal Encoding	51	.2018	2.0890*
	Motor Encoding	53	.0281	.2970
	Auditory-Vocal Automatic	52	.1921	2.0094
	Auditory-Vocal Sequencing	52	.3293	3.4445***
	Visual-Motor Sequencing	53	.1165	1.2315
	ITPA Total	51	.3146	3.2567***

TABLE I (Continued)

Test		N	$\bar{z}$	t
	Word Meaning	52	.1026	1.0732
	Listening	52	-.0496	-.5188
	Matching	53	.0425	.4492
Metropolitan	Alphabet	53	.0847	.8953
	Numbers	53	.0478	.5052
	Copying	49	.1052	1.0669
	Total Metropolitan	49	.1277	1.2951

*p < .05
**p < .02
***p < .01

emphasized the statistical relationship between the W-BAR and the following tests: WPPSI, Comprehension, .025; WPPSI, Vocabulary, .005; ITPA, Auditory-Vocal Association, .05; ITPA, Vocal Encoding, .005; ITPA, Auditory-Vocal Sequencing, .025; and the total ITPA Score.

The chi square statistic produced results which were in some instances different than those obtained by the use of Kendall's tau. In converting data from the design required by Kendall's tau to a four cell expectancy table in order to compute chi square, scores had to be assigned to either the high or low group in the expectancy table. The scores of the W-BAR and those of the academic predictors which both approach the median were lost as they had to be artificially dichotomized into either high or low groups. This manipulation led to results varying from those obtained by Kendall's tau. With chi square the following tests were also found to be significant Geometric Design, at a level of .01; Visual Decoding, at a level of .05; Auditory Vocal Automatic, at a level of .025, and the Metropolitan Copying Test, at a level of .01. As can be noted on Table I, some of the aforementioned tests approached statistical significance with the Kendall's tau.

Results

The original subject pool for this study was comprised of fifty-three children. During the administration of the Frostig six of the children were not in attendance in the

school system. The Wide Range Achievement Test was given to fifty-one children as two were withdrawn from school during the testing period.

Two children were not scored on various portions of the ITPA. These children were unable to function in the areas of the ITPA which required auditory vocal association, vocal encoding, auditory vocal sequencing, and auditory vocal automatic skills. The subtests of the Metropolitan Test were administered on different days, complete results not being obtainable due to the absence of five of the children.

The overall testing period involved in this research covered a fourteen month span, with counselors and teachers involved in the administration of the preliminary tests. Each particular test battery was given in its entirety at a specific time with lapses in time occurring between the different batteries. This investigator was responsible for the administration of the W-BAR and the WRAT which were given in May 1969.

This study was limited to the population of three first grades composed of high risk first graders. The conclusions drawn from the data presented must be limited to this specific group of children.

Rhyming is defined in this study as the ability to give a rhyme response to a stimulus word on the W-BAR Test. The obtained correlation between taus indicates a signif-icant relationship between performance on the W-BAR and

performance of the Frostig Subtest IV; all of the verbal
tests of the WPPSI; the WPPSI subtest, Block Design;
the total score of the WWPSI; Auditory-Vocal Association,
Vocal Encoding, Auditory Vocal Sequencing, and the total
score of the ITPA.

Maslow, Frostig, Lefever, and Whittlesey (1963) state
that the items in Subtest IV of the Frostig measure the
ability to determine position in space (directionality).
This test includes figures facing different directions,
the task being to find figures positioned identically amid
reversals and rotations. The authors also state that those
children who have problems with reversals and rotations of
figures also have difficulty in their ability to analyze
spacial relationships as well as possible auditory percep-
tual difficulties. Such children have difficulty in at-
tention span and exhibit behavioral deviations.

The WPPSI Test described by Wechsler (1967) consists
of a battery of subtests, each a measure of a different
ability. When combined into a total score, these subtests
serve as a measure of global intellectual capacity. The
test battery is divided into two parts, Verbal and Perfor-
mance. The Verbal subtests are: Information, Comprehension,
Arithmetic, Similarities, and Vocabulary. The Block Design
Test, a performance test, was found to correlate on the
WISC with Comprehension, Information, and Vocabulary better
than some of the verbal tests themselves (Wechsler, 1967).
Wechsler describes the Block Design test as a sorting as

well as a perceptual motor test. The child must not only
identify colors but also think through geometric forms
before assembling the blocks into a pattern.

Kirk, McCarthy, and Kirk (1961) state that the
Auditory-Vocal Association subtest measures the child's
ability to relate concepts presented orally. They feel
that the requirements of the auditory receptive process and
the vocal expressive process are minimal in this test while
the organizing process of manipulating linguistic symbols
in a meaningful way is tested by verbal analogies. The
purpose of the Vocal Encoding Test is to assess the child's
ability to express his ideas verbally. The Auditory-Vocal
Sequencing test measures the child's ability to reproduce
a sequence of auditory stimuli. The authors of this test
state that the total score of the ITPA reflects difficulties
in communication. The ITPA is a test of specific cognitive
abilities, and a test of molar intelligence.

The ability to rhyme as defined in this study has
been found to have a statistically significant relationship
to tests and subtests that measure abilities to analyze
spacial relationships, auditory perceptual ability, global
intelligence, verbal ability, and the ability to work ef-
fectively with sorting tasks. Rhyming also relates to the
ability to relate concepts orally, manipulate linguistic
symbols in a meaninful way, reproduce a sequence of
auditory stimuli, and the overall cognitive and communica-
tion abilities measured by the ITPA.

Theoretical Considerations

It is interesting to note that the W-BAR scores not only do not correlate with the WRAT reading test scores but also do not correlate with either the Frostig or the Metropolitan, both predictors of reading ability. It is also interesting that there was no relationship found between the visual perception or motor tests on either the ITPA or the Frostig and the W-BAR. Rhyming appears to be a verbal ability, requiring global intelligence, using both auditory and vocal associations and sorting skills, rather than a skill related to reading.

In an unpublished study conducted by this investigator and Bratner (1969), rhyming ability was tested by the W-BAR with 6, 8, and 10 year old children within the educable mentally retarded, normal, and bright range of intelligence. Rhyming appeared to be a developmental skill. The rhyming skills of the children at six years of age in the normal and bright group were as well developed as those of the eight and ten years old groups. The rhyming scores of the mentally retarded children improved consistantly in the older groups, but did not reach scores obtained by the normal and bright children in the six year group.

Measures of intelligence are derived from tests of specific types of performance; future reading ability or readiness is determined by tests which relate these scores obtained by children prior to reading to those obtained in the first years of school. The teaching of reading and

the skills necessary to the child in order for him to learn
to read must be carefully defined, researched, and grouped
in order to point to the significant variables related to
how children learn to read. The psychological, linguistic,
perceptual, intellectual, and study skills which do contri-
bute to reading ability are in need of further research. It
is also suggested that the present modes of teaching reading
be further investigated. It is with these questions and
ideas in mind that this study was written.

Chapter 4

SUMMARY

The problem of the relationship of rhyming to reading
and to thirty-five generally accepted predictors of academic
achievement was investigated by this experimenter. The
individual subtest scores and total scores of the Frostig
Test, the ITPA, the WPPSI, the Metropolitan Readiness Test,
and the WRAT Reading Test, Level I, were compared with the
performance on the Rhyming Test.

A total of fifty-three children ranging in age from
five years and ten months to six years and ten months were
used. There were seventeen girls and thirty six boys, the
total population of first grade students in three elementary
schools in Oklahoma City, Oklahoma. The Oklahoma City
Public Schools had classified these subjects as high risk
first graders. These high risk first graders were classi-
fied on the basis of the following testing program. All
kindergarten children in these schools were administered a
Draw-A-Person test, rated by their kindergarten teacher on
a one to three scale and individually studied by a screening
committee. The children were tested by a neurologist for
possible motor development problems. Those children with

low scores were then administered the Frostig Test, the WPPSI, the ITPA, and the Metropolitan Readiness Test.

Research into the study of rhyming indicates that teachers were teaching rhyming to the children as early as 1916 (Gray, 1948). Rhyming was used in some of the following approaches; the word recognition method was used in the Gordon Readers which were published in 1902, 1910, and 1918; the phonetic method of teaching reading was used in "The Children's Method Reader" published in 1918; the Moore-Wilson Readers published in 1927 used the "families" approach to the rhyming of words; and in 1915 rhyming was used in the form of Mother Goose rhymes.

It is Gray's (1948) contention that the child needs practice in phonetic analysis in order to develop a facility for recognizing unfamiliar words by reason of their similarities to familiar words which rhyme with the new words. Russell (1961) suggests that children at the reading readiness level should listen to and say nursery rhymes as well as rhyming words out of context; at the preprimer level they should be able to reproduce rhymes and select rhyming words; and at the primer level they should complete and compose rhymes.

In Monroe's (1951) book she suggests the continuation of the rhyming technique as a teaching aid until a child is able to give a list of three or four rhyming words when given a stimulus word by the teacher. Rhyming is a

fundamental of learning to read in the first grade (McKee, 1948). In support of contentions such as these, Gates (1947) incorporates a rhyming test as part of the Gates .Reading Readiness Test.

Binet used rhyming as a part of intelligence testing in his 1908 scale. More than any other scale in the Binet test, rhyming has been shifted from one age level to another; at the present, it is a part of the IX level with an alternate rhyming test at the same age level. The new reading series by Engelmann Bruner uses rhyming for much of its basic reading instruction.

With this emphasis on the teaching of rhyming in the literature, this investigator in conjunction with Bratner designed a rhyming test comprised of twenty-nine cards each with four pictures of equal intensity and size. Each subject was given a stimulus word and asked to choose the picture of the object whose name sounded the most like the word presented verbally. The raw score, number of correct responses minus the number of incorrect responses, was determined and compared to the raw scores of the thirty-five other predictors of academic achievement. The Kendall Rank-Order Correlation and t-tests for significance were computed. Expectancy tables and chi-square were also used to show the significant differences between the two variables.

The following tests and subtest were found to be significantly related to the W-BAR test using Kendall's Rank

Order Correlation beyond the .05 level of significance:
Frostig IV, WPPSI, Information, Comprehension, Arithmetic,
Similarities, Vocabulary, Block Design, WPPSI Total score,
ITPA, Auditory-Vocal Association, Vocal Encoding, Auditory-
Vocal Sequencing, and the total ITPA score.

With the prevalence of the use of rhyming by teachers
from preschool through the elementary grades and the inclu-
sion of rhyming in various tests of academic readiness, this
investigator was motivated to do this study. The results
of having compared rhyming with these academic predictors,
it is the opinion of this investigator that rhyming as
measured by the W-BAR appears to be an auditory vocal
ability requiring sorting techniques, verbal abilities,
and related to global intelligence. It is also the opinion
of this investigator that rhyming is not a skill related
to reading or a technique for teaching reading.

Further study into the relationship of rhyming to
reading could be investigated in the following way:

a. Test the relationship of rhyming to reading with
groups of normal and bright children.

b. Test rhyming ability with three, five, and seven
year olds both normal and bright children to study rhyming
developmentally.

c. Study rhyming with three, five, and seven year
old retarded children.

d. Test rhyming ability with educable retarded
children, both readers and nonreaders.

e. Test rhyming with first, third, and fifth grade children with groups of educable, normal, and bright to compare levels of ability at different ages.

f. Test other word attack skills used in the teaching of reading. Some of the other types of activities used in the teaching of reading may correlate significantly with general intelligence and not with reading.

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APPENDICES

TABLE A

37

Group	Test
	Children's Names
	W-BAR
	WRAT
Frostig	Frostig I
	Frostig II
	Frostig III
	Frostig IV
	Frostig V
	Total - Frostig
WPPSI	Information
	Comprehension
	Arithmetic
	Similarities
	Vocabulary
	Animal House
	Picture Completion
	Mazes
	Block Design
	Geometric Design
	Total - WPPSI
ITPA	Auditory-Vocal Automatic
	Visual Decoding
	Motor Encoding
	Auditory-Vocal Association
	Visual-Motor Sequencing
	Vocal Encoding
	Auditory-Vocal Sequencing
	Visual-Motor Association
	Auditory Decoding
	Total - ITPA
Metropolitan	Word Meaning
	Listening
	Matching
	Alphabet
	Numbers
	Copying
	Total - Metropolitan

TABLE B

Means and Standard Deviations for the W-BAR, WRAT, Frostig, ITPA,

and Metropolitan Variables (Raw Scores)

Test		N	Mean	S.D.
W-BAR		53	17.5094	4.5048
WRAT, Reading, Level 1		51	27.3333	7.8833
Frostig	Test I	47	11.9574	2.9040
	Test II	47	12.1915	5.4798
	Test III	47	7.0638	2.9957
	Test IV	47	5.4255	1.4999
	Test V	47	4.5319	1.5722
	Frostig Total	47	40.5319	7.7174
WPPSI	Information	53	13.9623	2.3856
	Comprehension	53	16.8302	4.6357
	Arithmetic	53	11.2264	2.5768
	Similarities	53	12.4340	3.8506
	Vocabulary	53	20.5094	5.3010
	Animal House	53	35.2830	14.0772
	Picture Completion	53	13.2264	2.8866
	Mazes	53	12.8679	4.7557
	Block Design	53	11.5472	3.5549
	Geometric Design	53	8.0755	3.0999
	WPPSI Total	53	154.9057	33.8425
ITPA	Auditory Decoding	53	23.0000	3.9759
	Visual Decoding	53	13.2264	2.8732
	Auditory Vocal Association	52	15.4423	3.1462
	Visual-Motor Association	53	15.9057	3.4656
	Vocal Encoding	51	16.9804	3.5411
	Motor Encoding	53	14.2642	3.9621
	Auditory-Vocal Automatic	52	10.0192	3.0518
	Auditory-Vocal Sequencing	52	18.3846	5.3766

TABLE B (Continued)

Test		N	Mean	S.D.
ITPA, contd.	Visual-Motor Sequencing	53	11.2264	2.5619
	ITPA Total	51	139.4510	16.0988
Metropolitan	Word Meaning	52	6.2885	2.3207
	Listening	52	10.4231	2.3292
	Matching	53	5.8491	3.2840
	Alphabet	53	7.2075	4.1573
	Numbers	53	9.7547	3.5997
	Copying	49	5.0612	4.2348
	Total Metropolitan	49	44.3878	15.8572

TABLE C

Expectancy Tables of Observed Frequencies, Expected Frequencies, and

Chi Square Values for the W-BAR and the 35 Predictors

of Academic Achievement

		Observed Frequency		Expected Frequency		N	p	χ^2
		High	Low	High	Low			
W-BAR		**WRAT**						
	High	18	9	16	11	51	.2254	1.457
	Low	12	12	14	10			
		Frostig I						
	High	13	12	12	13	47	.6590	.201
	Low	10	12	11	11			
		Frostig II						
	High	14	11	15	10	47	.6041	.735
	Low	15	7	14	8			
		Frostig III						
	High	15	10	12	13	47	.1020	2.616
	Low	8	14	11	11			
		Frostig IV						
	High	15	10	13	12	47	.6805	.994
	Low	10	12	12	10			
		Frostig V						
	High	20	5	18	7	47	.1140	2.446
	Low	13	9	15	7			
		Frostig Total						
	High	13	12	14	11	47	.5734	.648
	Low	14	8	13	9			
		WPPSI Information						
	High	20	8	18	10	53	.2408	1.367
	Low	14	11	16	9			

*p < .05   **p < .025   ***p < .01   ****p < .005

TABLE C (continued)

		Observed Frequency		Expected Frequency		N	p	χ^2
		High	Low	High	Low			
W-BAR		WPPSI Comprehension						
	High	18	10	14	14	53	.0181	5.509**
	Low	8	17	12	13			
		WPPSI Arithmetic						
	High	21	7	20	8	53	.6119	.758
	Low	16	9	17	8			
		WPPSI Similarities						
	High	19	9	16	12	53	.0767	3.060
	Low	11	14	14	11			
		WPPSI Vocabulary						
	High	18	10	12	16	52	.0017	10.475****
	Low	8	26	14	20			
		WPPSI Animal House						
	High	17	11	15	13	53	.6440	.862
	Low	12	13	14	11			
		WPPSI Picture Completion						
	High	20	8	20	8	53	.7826	.074
	Low	17	8	17	7			
		WPPSI Mazes						
	High	15	13	13	15	53	.6758	.976
	Low	10	15	12	13			
		WPPSI Block Design						
	High	22	6	20	8	53	.1378	2.161
	Low	15	10	17	8			
		WPPSI Geometric Design						
	High	19	9	14	14	53	.0091	6.795***
	Low	8	17	13	12			

TABLE C (continued)

		Observed Frequency		Expected Frequency		N	p	χ^2
		High	Low	High	Low			
W-BAR		WPPSI Total						
	High	19	9	16	12	53	.0767	3.060
	Low	11	14	14	11			
		ITPA Auditory Decoding						
	High	18	10	17	11	53	.5456	.379
	Low	14	11	15	10			
		ITPA Visual Decoding						
	High	24	4	21	7	53	.0321	4.493*
	Low	15	10	18	7			
		ITPA Auditory Vocal Association						
	High	21	7	17	11	52	.0294	4.645*
	Low	11	13	15	9			
		ITPA Visual Motor Association						
	High	14	14	13	15	53	.5276	.533
	Low	10	15	11	14			
		ITPA Vocal Encoding						
	High	20	7	15	12	51	.0039	8.518****
	Low	8	16	13	11			
		ITPA Motor Encoding						
	High	13	15	11	18	53	.1637	1.909
	Low	7	18	9	16			
		ITPA Auditory-Vocal Automatic						
	High	19	9	15	13	52	.0126	6.170**
	Low	8	16	12	12			
		ITPA Auditory Vocal Sequencing						
	High	20	8	16	12	52	.0136	6.031**
	Low	9	15	13	11			

TABLE C (continued)

		Observed Frequency		Expected Frequency		N	p	χ^2
		High	Low	High	Low			
W-BAR		**ITPA Visual Motor Sequencing**						
	High	17	11	15	13	53	.2216	1.481
	Low	11	14	13	12			
		ITPA Total						
	High	18	9	13	14	51	.0076	7.150***
	Low	7	17	12	12			
		Metropolitan Word Meaning						
	High	10	18	9	19	52	.6221	.252
	Low	7	17	8	16			
		Metropolitan Listening						
	High	18	10	17	11	52	.5346	.550
	Low	13	11	14	10			
		Metropolitan Matching						
	High	11	17	11	17	53	.8010	.061
	Low	9	16	9	16			
		Metropolitan Alphabet						
	High	15	13	12	16	53	.1099	2.502
	Low	8	17	11	14			
		Metropolitan Numbers						
	High	13	15	14	14	53	.6885	.164
	Low	13	12	12	13			
		Metropolitan Copying						
	High	13	13	8	18	49	.0061	7.580***
	Low	3	20	8	15			
		Metropolitan Total						
	High	15	12	13	14	49	.3086	1.041
	Low	9	13	11	11			

TABLE D

Stimulus Words and Objects Depicted on the 29 Cards of the W-BAB

Stimulus word	Picture 1	Picture 2	Picture 3	Picture 4
1. suck	rope	duck	bus	fork
2. fun	bone	corn	sun	truck
3. cuss	horse	bus	cup	ghost
4. wipe	cake	pipe	kite	sock
5. life	knife	eye	train	car
6. my	star	pie	chain	pipe
7. higher	snake	eye	clown	fire
8. more	saw	duck	bone	door
9. wrote	ghost	boat	truck	bird
10. most	book	rope	cup	ghost
11. she	swing	ear	dress	key
12. me	tree	king	belt	leaf
13. feel	wheel	bell	key	witch
14. wish	witch	fish	leaf	dress
15. rich	leaf	chair	witch	fish
16. thing	fish	key	bell	swing
17. said	belt	swing	bed	bird
18. fell	bat	king	bell	bear
19. care	dress	flag	chair	witch
20. take	chain	cake	eye	bird
21. make	pipe	flag	snake	train
22. frown	house	corn	clown	boat
23. sag	bed	star	bat	flag
24. far	star	frog	sun	horse
25. call	cup	frog	ball	horse
26. torn	corn	fork	car	truck
27. look	book	sock	fork	duck
28. noon	bone	shoe	corn	spoon
29. to	book	door	shoe	broom

Note.- Vowel sounds were the criteria for selection of both the stimulus and picture words. Vowels in the picture words represent the sounds most like the vowel sounds in the stimulus word.