THE READING ACHIEVEMENT OF STUDENTS DURING GRADE LEVELS ONE THROUGH FIVE RECEIVING A METHOD OF READING INSTRUCTION AS DETERMINED BY METHODS PREFERENCE

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This work is dedicated with loving thanks to my mother, Mrs. Wanda Haskett.

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CHAPTER I

PRESENTATION OF THE PROBLEM

Introduction

The goal of every teacher of reading is to help children learn to read and develop good reading skills. Teachers recognize that children are uniquely different and that each child learns to read in a unique and individual way. Teachers have recognized these individual differences and have varied reading methods and materials in order to find the most effective teaching method to develop reading skills for individual children.

Teachers of reading have used various methods of assessment in order to determine the strengths of the learner before initial reading instruction is begun. A battery of tests administered at the end of kindergarten to determine a methods preference has been used by many public schools in Oklahoma. The specific method preference scores indicated by the battery reveal a methods preference which is a demonstrated preference for a specific method of reacing instruction. Recognition of methods preference as a method for differentiating initial reading instruction is one way to provide a reading program based on the strengths of the learner. Differential assignments of children to reading instruction based on their preferred method represents an attempt

match learner strengths with instructional method so that providing for individual differences will afford a more effective instructional strategy for reading instruction.

After assessment was made to determine a child's methods preference, instructional methods and materials used in the classroom to teach reading were modified in accordance with the child's methods preference. For a child showing auditory-visual strengths, reading was taught using phonic methods and materials which employ auditory processing. For a child with visual-auditory strengths, reading was taught using sight or whole-word reading approaches since these methods rely on visual presentation of materials. Methods and materials for pre-preference were developed to meet the skill needs of the individual child and presented at a pace to provide successful reading instruction for each child. These methods of reading instruction as determined by methods preference were used in the classroom throughout grade levels one through five.

Information is needed to determine if there is a significant difference among the three teaching methods as determined by methods preference during grade levels one through five in terms of reading achievement and to determine if the subjects performed equally well on the reading achievement tests each time it was administered during grade levels one through five. Information is

also needed to determine if the trend of reading achievement test performance across grade levels one through five is similar for all three methods of reading instruction as determined by methods preference.

Purpose of the Study

The purpose of this study was to investigate the relationships among the reading achievement performances of students who received one of three methods of reading instruction as determined by methods preference throughout grade levels one through five.

Statement of the Problem

Teachers of reading recognize individual differences among students as they learn to read. They realize that the best method of reading instruction for the child is based upon the strengths of the learner. Many public schools in Oklahoma administer a battery of tests to determine the methodology preference of the learner. In the schools reading instruction is differentiated during grade levels one through five utilizing a method of reading instruction as determined by the methods preference of the learner. Reading achievement tests are administered during grade levels one through five. Analysis of reading achievement performances could provide information useful for selection of the reading methods and materials which are the most appropriate for each child. This study was designed to investigate the relationships among reading achievement performances of students who received a method of

reading instruction as determined by methods preference during grade levels one through five.

Hypotheses

This study was designed to test the following hypotheses:

Hypothesis I: Mean reading achievement performances for each of three methods of reading instruction as determined by methods preference when averaged across grade levels one through five were drawn from populations having the same means.

Hypothesis II: Mean reading achievement performances for grade levels one through five for each of three methods of reading instruction as determined by methods preference were drawn from populations having the same means.

Hypothesis III: The samples were drawn from populations in which the differences between any two methods of reading instruction as determined by methods preference are the same for grade levels one through five, and similarly, the differences between grade levels one through five's test performance means are the same for each of three methods of reading instruction as determined by methods preference.

All hypotheses were tested at the .05 level of significance.

Assumptions

For the purpose of this study, it was assumed that the sample of students used in the study is representative of a larger group of students in grade levels one through five.

Limitations

This study was limited by the sample size which was due to the nature of a highly mobile population. The majority of students in the sample were middle class and Caucasian. The study was also limited to a specific geographic location.

Definition of Terms

Methods Preference

Methods preference is a demonstrated preference for a specific method of instruction in reading. It is the method of reading instruction in which the child learns most successfully. The three methods preferences referred to in this study include the auditory-visual method, the visual-auditory method, and the pre-preference method.

Auditory-Visual Method. The auditory-visual method of reading instruction has the letter as the basic unit of instruction. Initially, the learner must accumulate a number of sound-symbol associations and use these in synthesizing, and thus decoding words. Skill transfer is accomplished through the use of known sound-symbol associations applied to unknown words (Ray, 1970).

Visual-Auditory Method. The visual-auditory method of reading instruction has the word as the basic unit of instruction. In the initial stages of learning the configuration of a roral word with pictures and verbal context clues provides the vehicle of instruction. The skill development program is dependent upon an

accumulation of sight words from controlled vocabulary reading material to be utilized later in an analytical approach to decoding (Ray, 1970).

Pre-Preference Method. The pre-preference method of reading instruction provides an extended program of pre-reading readiness skills before initial presentation of reading instruction at first grade level. Emphasis is placed upon developing skills necessary for sight word recognition and comprehension. The pace of reading instruction is modified according to the strengths and success of the learner.

Reading Achievement

Reading achievement refers to the ability to understand printed materials. In this study, it refers to scores attained on a standardized test of reading achievement, the Gates-MacGinitie Reading Test (1978).

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

Many research studies have examined the value of adapting methods and materials of reading instruction to the modality preference of the learner. Reviews of the research on matching modality preference and teaching method have been made by Jones (1971), Cooper (1972), Arter and Jenkins (1977), Derevensky (1978), Austin and Donovan (1978), Tarver and Dawson (1978), Kampwirth and Bates (1980), Barbe, Swassing, Milone, and Kampwirth (1981), and Larrivee (1981). The results of the efficacy of adapting instructional method to the modality preference of the learner have been mixed. Table I presents a compilation of these results.

The research studies do establish an auditory modality preference and a visual modality preference for learners and children are described as primarily auditory or visual learners based on strengths and weaknesses in their auditory and visual channels. Hillerich (1975) and Keogh (1977) encourage early assessment and choice of instructional strategies used in beginning reading. Screening should be directed at compentencies which can be used to ensure success. Differential program development can be based on this information. Dunn, Dunn, and

TABLE I

RESEARCH SUMMARY OF MODALITY/ INSTRUCTIONAL MATCHING

Study	Selection of Subjects: Modality Assessment	Selection of Subjects: Selection Criteria	Selection of Subjects: Sample/N	Statistical Design
Smith and Ringler (1971)	New York University Modality Test 1968	Modality preference defined as any one of 3 T-scores exceeding other 2 by minimum .5 SD	Lower socio-economic first; N=82	Stepwise multiple regression; reading readiness, modality preference, reading achievement, sex
Smith (1971)	V: ITPA: V Reception, Association & Sequential Memory A: ITPA: A Reception, Association, Closure, & Sequential Memory	Modality strengths defined as mean V & A scores differing by more than 1 yr. Differences of 1 month or less indicated no modality preference.	Culturally Disadvantaged 1st & 2nd grade; N=72	3 (modality preference: A, V or neither) X 3 (instructional measure)
Robinson (1972)	V: Goins: Picture Squares Test, Reversal Test, and Pattern Coping A: Wepman Auditory Discrimination Test	V: Subjects with V strengths scored above or below group median on each of 3 V tests A: Wepman scores of 22-30 high A, 4-21 low A	First grade followed to third; N=116	4 combinations of high & low AV X 2 instructional method ANOVA
Waugh (1973)	V: ITPA Visual Reception, Visual Association A: Auditory Reception, Auditory Association	A: Mean A score 2 SD greater than mean V score V: Mean V score 1 SD greater than mean A score	2nd grade; N=17	2 (modality perference) X 2 (instructional method) ANOVA with repeated measures on second variable
Miller (1974)	V: Visual Discrimination, visual memory, visual closure A: Auditory discrimination, auditory memory, auditory closure	Tests of discrimination, memory, and closure. Auditory standard score was subtracted from visual standard score in same variable--3 difference scores--total modality score sum of 3 difference scores	Normal 1st grade; N=62	1 yr. V: Bank Street Reader Macmillian A: Palo-Alto Reading Program Harcourt, Brace Jovanovich, Inc. Correlation Coefficients ANOVA, T-tests, Measures of Central Tendency, Fisher's Exact Probability test
Vandever and Neville (1974)	Sample lessons A: Stressed letter sounds V: Stressed word configuration Kinesthetic: Stressed tracing	Modality strengths defined as actual score in one modality greater than that predicted by multiple regression of other 2 scores	Normal 2nd grade; N=72	3 (instruction, visual auditory, or kinesthetic) X 2 (strength or weakness) X 6 weeks of instruction, ANCOVA
Foster, Reese, and Schmidt (1976)	V: Multiple Choice Bender A: Test of Auditory Perception	A: Score above mean on TAP, below on MCB with scores at least 1.6 SD apart or V: Score above mean MCB and below mean on TAP with scores at least 1.6 SD apart	N=20	2 way ANOVA for repeated measures
Donovan and Austin (1978)	A: Auditory sequential memory--ITPA, Gates MacGinitie Readiness Tests V: Visual sequential memory--ITPA, Gates MacGinitie Readiness Tests	A: Scales scores on ASM 9 points or more above SS on VSM, average stanine on 4 auditory tests of GMRT two stanines higher than on 4 visual tests GMRT V: Scaled score on VSM 9 points or more above SS on VSM, average stanine on 4 visual tests of GMRT two stanines higher than on 4 auditory tests of GMRT	Normal 1st grade; N=107	One-way, two-way ANCOVA

TABLE I (Continued)

Study	Training Procedures: Length	Training Procedures: Test Materials	Learning Measures	Validity Problems	Modality Instruction Interaction	Modality Preference	Modality Preference Displayed
S & R (1971)		-	Metropolitan Reading Test	Instructional materials not described	No	Yes A, V, K	Yes
S (1971)	2 yrs.	(1) Initial Teaching Alphabet Early to Read (2) Words in Color plus Lippincott & (3) Reading for Meaning Basal Plus Reading with Phonics	Metropolitan Achievement Test: Word Knowledge, Word Discrimination & Reading Comprenension	Potential bias in learning measure. Reading programs not modality pure.	No	Yes V, A	Yes
R (1972)		V: Scott Foresman A: Hay Wingo Phonics Approach Lippincott	Metropolitan Achievement Test; Gray Oral Reading Test; Huelsman Word Discrimination Test	High attrition rate of subjects; reading programs not modality pure	No	Yes V, A	Yes V, A
W (1973)	1 hour	Recognition of 10 printed words read by teacher. V: Stress on configuration & visualization of words A: Stress on sounds of words	V recognition of word read by teacher	Duration of study was brief. Artificial learning tests.	No	Yes	Yes
M (1974)					No	Yes V, A	Yes V, A
V & N (1974)	25 minutes a day/4 days a week/6 weeks	Learning words taken from reading text which fewer than 25% of students knew; Instruction in A, V, & K methods	Test over words used in instruction		No	Yes	Yes
F, R, & S (1976)	2 7-minute sessions on 2 days	20 unknown words	Test over words used in instruction	Small number subjects, few words taught in instructional method	Yes	Yes	Yes
D & A (1978)	1 yr.	A: Structural Reading Program V: Hawaii English Program	Woodcock Reading Mastery Test; Gates-MacGinitie Reading Test, Primary A		Yes	Yes	Yes

Price (1977) feel that diagnostic procedures should be employed and the results of the diagnoses should be translated into complementary instructional strategies. They suggest that how a student learns is perhaps the most important factor related to achievement and teachers should make an effort to determine how individual students learn. Teachers should recognize that children have a learning preference and that some are visual rather than auditory learners.

The use of early assessment data to determine a child's modality preference for the purpose of selecting an initial reading program which is congruent with that preference is one way to ensure the child's success.

Barbe, Swassing, Milone, and Kampwirth (1981) suggest that the criteria for determining who is visual, auditory, and kinesthetic are not well established. All of the studies use different measurements and criteria to establish modality preference. Cooper (1972) states that several different procedures have been utilized to determine the learner's modality strength for reading.

Researchers have used many different psychometric tests such as the Illinois Test of Psycholinguistic Abilities (ITPA), Test of Auditory Perception (TAP), Bender Visual Motor Gestalt Test (BVMGT), and others to establish a modality preference. Measures of modality assessment by the use of sample lessons which emphasized either auditory or visual reception have been used by some researchers.

Derevensky (1977) suggests that a primary concern should be the development and standardization of an instrument designed to assess sensory information processing capabilities in terms of modal preferences and strengths.

Research Relating Modality Preference and Method of Reading Instruction

Through utilization of different criteria, researchers have identified student modality preference for initial reading instruction. After a modality preference has been established, the next question concerns differentiating intial reading instruction according to modality strengths. It is hypothesized that children who demonstrate an auditory modality preference will achieve higher scores on measures of reading achievement when the initial reading program is highly auditory using phonic methods and materials. Conversely, it is hypothesized that children who demonstrate a visual modality preference will achieve higher scores on measures of reading achievement when the initial reading program is highly visual using sight or whole word reading approaches.

In the research studies on modality preference and reading instruction, a preferential mode was determined for each child based on a criteria score on some measure or combination of measures of auditory and visual aptitude. In the experimental designs, students having an auditory preference received either an auditory or visual approach and students having a visual preference received

either a visual or an auditory approach. Mixed modality preference, no modality preference, and kinesthetic modality preference were established by some researchers. A method by modality interaction was tested by some assessment of reading achievement.

Smith and Ringler (1971) examined the relationships among reading readiness, preferred sensory modality, and reading achievement of 82 first-grade children from a lower socio-economic area. Thirty-two females and 50 males constituted the sample. The New York State Reading Readiness Test, which is a special edition of the Metropolitan Reading Readiness Test, was administered at the beginning of the school year. The New York University Modality Test (1968) was used to identify the preferred modality of the pupils from among auditory, visual, and kinesthetic modalities. To determine each preferred modality, intra-child T-scores were examined. If any one of the three T-scores exceeded the other two by a minimum of .5 SD, this modality was assigned to the subject as his preferred modality. Twenty subjects were classified as having an auditory modality preference, 20 subjects were classified as having a visual modality preference, and 18 as having preferred kinesthetic modality. Twenty-four were identified as having mixed modality since no one of the three T-scores was .5 SD higher than the other two. Reading achievement was measured at the end of first grade by the Metropolitan Reading Test, Primary 1. A step-wise

multiple regression analysis yielded a multiple R of .670 and thus a coefficient determination (R^2) of .449. The R^2 yields the proportion of variance accounted for in reading scores so each independent variable was examined for contribution. It was found that 43% of the 45% of variance was related to reading readiness. The remaining 2% was equally divided between modality preference and sex. These results indicate that reading readiness rather than modality preference is highly correlated with first grade reading achievement.

Although the authors concluded that reading readiness is the major variable related to predicting first grade reading achievement and modality preference is not a predictor of first grade reading achievement, they suggested that additional research focus on the efficacy of matching modality preference to methods of teaching beginning reading. Differentiating instruction to accomodate a child's learning preference could be beneficial to the child.

Ringler, Smith, and Cullinan (1971) identified the modality preference of 128 first graders using the New York University Modality Test. The children were then randomly assigned within each modality to one of the four experimental groups identified as visual, auditory, kinesthetic, and combined or to one of the four control groups. The learning task for each group was a vocabulary list of 50 nouns and verbs based on the spoken language of the children and included only those words which had not been

formally taught in the classroom. A criterion test consisting of the vocabulary list of 50 words plus an additional 150 words which served as distractors was used as the pretest and posttest measure of vocabulary development. All students received the regular program of first grade instruction in the Bank Street Readers. In addition to this instruction, the experimental groups received approximately 7.5 hours of instruction using one of the four instructional methods matched to the established modality preference of the learner.

Statistical analysis on data from 106 subjects indicated that the experimental groups made significantly greater gains than did the control groups, but there were no significant differences among the groups when the groups were categorized by modality preference. Children who were taught using their modality preference did not make significantly greater gains than did those who received instruction not congruent with their modality preference.

The researchers felt that children do have preferred modalities and that these can be differentiated. They suggest continued research with the goal that children may be provided with reading instruction that uses their most efficient intake processes with the hope that maximum reading achievement will result.

The relationships between reading method and reading achievement to sensory modalities were explored by Smith (1971) using subtests of the Illinois Test of Psycholinguistic Abilities

for determining sensory modalities of 608 first grade children. The visual decoding, visual motor association, and visual motor sequential subtest scores were averaged to produce a visual score. Auditory decoding, auditory vocal association, auditory vocal automatic, and auditory vocal sequential subtest scores were averaged for an auditory score. Language age scores in months from the subtests were used to compute an auditory or visual difference score. Subjects with a difference of 12 or more months between their average auditory and visual scores were designated auditory or visual types according to superior modality. The control group was composed of children having an auditory-visual difference of no more than one month. Subjects were classified as culturally disadvantaged and had a mean intelligence quotient (IQ) of 90. Subjects were randomly discarded from subject and treatment groups to establish equal cell frequencies of eight subjects for a total number of 72 subjects. The three programs involved over the two year treatment period were the Initial Teaching Alphabet Early-to-Read Series followed by the Lippincott series, Words in Color program followed by the Lippincott series, and the Reading for Meaning basal reading series supplemented by Reading with Phonics. Teachers kept the same groups for the two year treatment period and instructed them in one of these programs.

A three-factor analysis of variance, with one factor a repeated measure, was employed to analyze the Metropolitan

Achievement Test reading-grade-equivalent scores obtained at the end of the first and second grades. No significant differences among the visual, auditory, and control groups on the factor of reading achievement were found at the conclusion of first grade or second grade. No interaction of method by modality was revealed. There was no statistically significant ($p > .05$) interaction effect on reading achievement and reading method as applied to visual, auditory, and control subjects.

Determining the relative progress in reading made by pupils with differing visual and auditory abilities when they were taught by two approaches to beginning reading was the purpose of a study by Robinson (1972). Three tests of visual perception from the Goins Battery and the Wepman Auditory Discrimination Test were used as the basis to group 448 first grade children into categories of high visual-high auditory, low visual-low auditory, high visual-low auditory, and low visual-high auditory. Word recognition skills were taught to 232 children using the visual method adapting the Scott, Foresman Reading Series and 216 children were taught by an auditory method using the Hay Wingo phonics approach. At the end of first grade, 162 students remained in the sample based on criteria for inclusion in the study. These children were followed until third grade at which time 116 pupils comprised the sample. Reading achievement tests were administered for the purpose of comparisons to determine whether long range differences in reading

achievement between groups of subjects taught by different methods would appear. Analysis of variance and covariance for the experimental group showed no significant interaction among visual and auditory modalities and the two instructional methods. These findings show that visual and auditory test scores do not combine with the two methods to affect reading scores. Children who scored high in both modalities consistently achieved higher reading scores. Children who scored low in both modalities made the least progress in reading either by an auditory or a visual method. In this study, if the modal weakness retarded initial reading progress, these groups of children did not recover before the end of the third grade. The researcher suggests intensive readiness training in weak modalities for the students who scored low in the modalities.

Waugh (1973) selected eight subjects with an auditory modality preference and nine subjects with a visual modality preference from 166 second grade children who were administered the auditory reception, auditory association, visual reception, and visual association subtests of the Illinois Test of Psycholinguistic Abilities. The auditory subjects were identified as having a mean score on the auditory subtests 2 SD above their mean on the visual scores. The visual subjects were identified as having a mean visual score 1 SD greater than their mean on the auditory scores. Subjects were given auditory and visual recall tasks and auditory and visual instructional procedures to aid in word recognition

tasks. Results of the study indicated that the auditory and visual learners performed equally well on auditory and visual tasks. There was no method by modality interaction.

Modality preference of 282 second graders was determined by Vandever and Neville (1974) by using three sample lessons of 12 words each in the visual, auditory, or kinesthetic modality. Seventy-two students, 47 boys and 25 girls, were selected based on modality strengths defined as the actual score in one modality being greater than that predicted by multiple regression of the other two scores. Six classifications of subjects resulted from the regression analysis: visual strength, visual weakness, auditory strength, auditory weakness, kinesthetic strength, and kinesthetic weakness. Subjects were assigned to nine instructional groups: three visual, three auditory, and three kinesthetic. Within each instructional group there were four strength subjects and four weakness subjects. Subjects were instructed once a day for 25 minutes, four days a week, for six weeks with materials which were as modality pure as possible. Words to be taught were selected from 179 introduced in the grade three readers in use at the school attended by the subjects. Words recognized by fewer than 25% of the subjects were used in the intervention. In the visual groups words were taught by presenting the whole words in sentences, discussing the length of the word and the meaning of the word, and matching words and shapes. The auditory group

sounded out letters in the words and worked with pronunciation and blending of sound units to form the word. The kinesthetic groups learned words through feeling textured words and tracing the words. At the end of six weeks, a three way univariate fixed effects analysis of covariance was conducted examining method of instruction (visual, auditory, kinesthetic), assignment (strength, weakness), and weeks (1-6). Results showed that there were no differences between visual, auditory, and kinesthetic treatments in the number of words learned, nor were there differences between those taught to their strengths and those taught to their weaknesses.

Miller (1974, 1979) examined the relationships among modality preference, method of beginning reading instruction, and reading achievement in two first grade classrooms in two schools. Sixty-two children were administered six tests to evaluate performance on auditory and visual measures of discrimination, memory, and closure. The raw scores were transformed to standard scores. An individual's preference was assigned by using a difference score that was computed by subtracting the child's standard score on an auditory measure from the child's standard score on the visual measure of the same type of subtest. Each individual had a preference score on discrimination, on memory, and on closure. In addition, total modality preference was computed. Based on the difference scores and on the total score, students were designated as having either an auditory or a visual modality preference. Thirty-four children

were placed in a classroom that stressed the visual whole-word approach. The Bank Street Readers (MacMillan, 1967) were chosen as the basal reading series. Twenty-eight students were placed in a classroom where reading instruction stressed the auditory approach by learning words by forming symbol-sound associations between letters or patterns and then blending them together to form the word. The Palo-Alto Reading Program, Sequential Steps in Reading (Harcourt, Brace, Jovanovich, Inc., 1968) was chosen to represent the phonic approach. Each classroom was considered to represent a different treatment. This instruction lasted one school year. Reading achievement was measured by performance on a standardized test of reading achievement administered at the end of the first grade year.

From the statistical analyses of the data, no significant relationships were demonstrated between any of the components of modality preference or total modality preference and word-recognition skills regardless of the method of reading instruction. There were no significant differences in reading achievement between those designated as having preference for an auditory or visual modality. There were significant differences in achievement between those with visual preference and those with auditory preference when the instruction stressed the phonics approach. However, these differences were not in the expected direction. The visual learners scored significantly higher than the auditory learners on tests of word-recognition ($\underline{t} = 2.12$, $\underline{p} \leq .05$) and comprehension ($\underline{t} = 3.25$, $\underline{p} \leq .01$).

The interpretation of the data by the researcher did not support the position that teaching word-recognition skills in an instructional method which was compatible with the modality preference of the learner would result in differences in reading achivement scores.

Wepman and Morency (1975) felt that instruction in reading when matched with the learning style of the children who have a modality preference would result in higher achievement scores than those children whose learning styles were mismatched to modality related instructional techniques. Modality preference was determined by scores on six subscales of the Perceptual Test Battery for 89 first graders, 80 second graders, and 78 third graders in one elementary school. Children were randomly assigned to classrooms where one-third showed an auditory preference, one-third showed a visual preference, and one-third showed no preference or balanced development. Auditory and visual adaptation were made of the Ginn 360 Reading Program to match learning methods with auditory and visual preference.

In first grade, children who showed an auditory preference achieved significantly higher when auditory decoding techniques were emphasized on initial presentation and children with visual preference scored lower. Visual children achieved significantly higher when visual decoding techniques were emphasized on the initial presentation of each objective of the lesson plans.

Auditory children scored significantly lower when the initial presentation was visual. In the second and third grades the results were not significant.

The positive results of this study support the researchers' conclusion that early reading instruction should be adjusted to individual differences in modality preference to benefit the child.

Foster, Reese, and Schmidt (1976) selected 10 children with an auditory modality preference and 10 children with a visual modality preference out of a total school population of 417 based on performances on the Test of Auditory Perception and the Multiple Choice Bender. Children were classified as having an auditory preference if they achieved above the norm on the Test of Auditory Perception and below the norm on the Multiple Choice Bender and if their scores on the two measures were at least 1.6 SD apart. They were classified as having a visual preference if their Multiple Choice Bender scores were above the mean, if the Test of Auditory Perception was below the mean, and if the scores on the two measures were at least 1.6 SD apart. The subjects were taught a series of unknown sight words through methods designed to be predominantly auditory or visual. Presentations of the words took place in two seven minute sessions on two separate days with half the subjects exposed to visual treatments and half to auditory treatments. On the second day subjects received training with the alternate procedure. Four days after the sessions, subjects were

tested over the unknown words taught auditorily and visually. Results of the analysis of data showed that auditory preference subjects retained significantly more words than did visual preference subjects when both groups were taught using predominantly auditory methods ($p < .05$). Visual preference subjects retained more words when taught under visual conditions than when taught under auditory conditions ($p < .01$). Auditory subjects did equally well under both instructional methods. The researchers suggest that children with a visual modality preference may learn sight words more efficiently when visual methods are used. The results indicate that a relationship does exist between measured modality strength and the ability to remember signt words taught through instructional methods designed to emphasize the auditory or visual modality.

Results of a study by Donovan and Austin (1978) indicated that pupils whose modality preferences were congruent with the primary instructional focus of initial reading programs achieved significantly higher on all measures of reading behavior than pupils whose modality preferences were not congruent with the primary instructional focus of the initial program. The sample consisted of 107 first grade pupils, 50 girls and 57 boys, who were identified as having an auditory modality preference, a visual modality preference, or no sensory modality preference. The pupils had been evaluated at the end of kindergarten with a diagnostic

battery which included the Peabody Picture Vocabulary Test, Goodenough Draw-A-Man Test, Developmental Test of Motor-Integration, Wepman Auditory Discrimination Test, selected subtests of the Illinois Test of Psycholinguistic Abilities, Keystone Visual Survey Tests, Informal Inventory of Letters and Numbers, and the Gates-MacGinitie Readiness Skills Test.

The auditory preferred learner was identified as a pupil whose scaled score on the auditory sequential memory subtest (ASM) of the Illinois Test of Psycholinguistic Abilities (ITPA) was nine or more points higher than the scales score on the visual sequential memory subtest (VSM) of the ITPA and/or one whose average stanine score on the four auditory tests of the Gates-MacGinitie Readiness Test (GMRT) is two stanines higher than the average stanine score on the four visual tests of the GMRT.

A visual preferred learner was one whose scaled score on the VSM subtest of the ITPA was nine or more points higher than the scaled score on the ASM subtest of the ITPA and/or whose average stanine score on the four visual tests of the GMRT was two stanines or more higher than the average score on the four auditory tests of the GMRT.

A learner with no sensory modality preference was one whose scaled score on the VSM and ASM tests from the ITPA differed by less than nine points and/or one whose average stanine scores on the auditory and visual tests differed by one or zero stanines.

Kindergarten assessment identified 19 auditory preferred learners, 36 visual preferred learners, and 52 learners with no sensory modality preference. Pupils were assigned randomly to experimental and control groups. The 52 students in the experimental group had an instructional program which was congruent with their modality preference. The 55 students in the control group had an instructional program which was not congruent with their modality preference. Instructional materials used were the Structural Reading Program which is an analytic phonics program, the Hawaii English Program which is a visual program using visual cues and visual memory with no direct teaching of sound-symbol association or phonic analysis cues, and the Reading 360 Program (Ginn and Co.) which was described by the researchers as an eclectic basal program which teaches through both visual and auditory modes.

At the end of first grade, reading achievement for all pupils was determined by the Woodcock Reading Mastery Test and the Gates MacGinitie Reading Test, Primary A. Results of the study showed that the experimental group with congruent placement achieved significantly higher than the control group with non-congruent placement on measures of reading vocabulary, general reading behavior, and comprehension. The differences were significant at the .001 level on measures of vocabulary and general reading behavior and on measures of comprehension the significance level

was .01. The findings of this study suggest the predetermined modality preference is an important consideration in early reading achievement. The researchers suggest that a kindergarten assessment battery which has discriminant and predictive validity be administered prior to initial reading instruction and that schools provide different instructional programs for auditory preferred learners and for visual preferred learners. The primary objective of the kindergarten assessment battery is to assure a match between the pupil's modality preference and the primary instructional focus of the initial reading program. Learners with an auditory modality preference should be placed in an instructional program which emphasizes sound-symbol association and other phonic cues. Learners with a visual modality preference should be placed in an instructional program which emphasizes visual discrimination, visual memory, and other visual cues.

The results of many of the studies do not indicate that modifying instruction to match instructional materials and methods with the modality preference of the learner will benefit the reading achievement of the child. However, many teachers and reading educators feel that beginning reading instruction can be improved by modality and instructional matching.

Arter and Jenkins (1977) surveyed practicing special education teachers to gather information on teachers' knowledge, perceptions, and use of the modality model. The questionnaire addressed the

topics of familiarity with the modality model, perceived importance of modality in planning instruction, perceived prevalence of the model, knowledge of research, beliefs relating to direct remediation of modality weakness, major source of information on the model, frequency of use, reasons for not using the model, perceived success with the model, manner of use, instruments used in assessing modality preference, and questions concerning educational background factors of the teachers. Analyses were conducted on 340 completed questionnaires. A majority of the teachers surveyed reported that they were familiar with the modality model. The following analyses were reported based on the responses (87%) who were familiar with the modality model. Responses from those surveyed suggest that teachers highly valued the modality model. Ninety-nine percent agreed that modality should be a major consideration when devising educational prescriptions, and 93% agreed that information about modality is one of the major outcomes of diagnosis. Those who placed the greatest value on modality considerations frequently used the modality model. Ninety-one percent of these teachers who always used the model agreed that modality should be a major consideration in instruction. Several questions were related to how teachers perceived their success with the modality model. Ninety-six percent of the respondents believed they obtained better results when they modified instruction in accord with the child's modality assessment. Teachers feel that matching

instructional methods and modality preferences help children meet success in learning to read.

Researchers have examined the relationships between modality preference, instructional method and reading achievement. Although the results have been mixed, Cooper (1972) suggests that individuals do show differences in how they learn and it only seems logical that they should learn more efficiently if they were taught by their learning strength. Barbe et al. (1981) state that the most accurate description of status of modality based instruction is that the issues surrounding its effectiveness are unresolved. Efforts to evaluate differentiated instruction in the classroom must be continued because it is a low risk/high benefit option.

Although Miller's (1974) study did not demonstrate the relationship between modality preference and reading achievement, she recommended that demonstration or mini-lessons might be given at the end of kindergarten or the beginning of first grade to detect the method of instruction which makes it easier for the child to learn. She suggests recording the number of words retained so the teacher may be able to draw inferences about the method of instruction appropriate for each child.

Cooper (1972) suggests that the most valid procedure available at present is trial teaching of a few words by the various modes. Some researchers have shown that children do exhibit a preference for particular methods of teaching reading

and seem to be more successful when learning to read if they are taught by their preferred method. The method of reading instruction matched with learner preference can produce significant results. Researchers have been successful using trial lessons to determine a child's preferred learning style. Batteries of tests have also been administered in order to determine the best predictors of learning preference.

Ray (1970) developed the Ray Reading Methods Test as an instrument to identify learning preference. The Ray Reading Methods Test is a learning methods test involving trial lessons in the different methods. The test was designed to evaluate the performance of children by measuring their response to a teaching-learning experience utilizing each of four methods of reading instruction. These methods were Visual-Auditory, Auditory-Visual, Linguistic-Word Structure, and Language Experience. The purpose of the test was the selection of a suitable method of instruction based upon the learner's demonstration of preference in the selection of recognition clues. The test was designed to be used with individuals or small groups consisting of six or fewer individuals. Basically, the procedure consisted of a series of trial teaching lessons accompanied by testing. Ten words were taught in two instructional periods for each method with a succession of posttests administered following each instructional period to measure the retention of the words which

were taught. The teacher can use the results of the Ray Reading Methods Test to match method of initial reading instruction to learner preference for a selected method.

Manwarren (1972) calculated odd-even split half correlation coefficients to determine the reliability of each subtest of the Ray Reading Methods Test. The study reported a correlation coefficient of .98 for auditory-visual and .88 for the visual-auditory.

Young (1975) and Treadway (1975) conducted companion studies to determine if there was a relationship between pre-reading behavior patterns and success with reading when differentiated methods of instruction were used. Young and Treadway administered a battery of tests to 66 kindergarten children. In addition to the tests administered in the companion studies, Treadway's study included contributing subtests from the Metropolitan Reading Readiness Test (1965). Scores from the four subtests on the Ray Reading Methods Test (1970) were used as the criterion variables. The researchers identified significant predictors of word recognition success under four methods of beginning reading instruction. The results of the investigations indicated that utilization of the significant subtests for each method could be used as predictors of success with that particular method of reading instructions (Tables II and III).

TABLE II

SUMMARY OF SIGNIFICANT (α = .05) PREDICTOR VARIABLES--
TREADWAY (1975)

Auditory-Visual Significant Predictor		Visual-Auditory Significant Predictor	
Subtest	Test	Subtest	Test
Grammatic Closure	ITPA[a]	Alphabet	MRT
Vocabulary	WWPSI[b]	Geometric Design	WPPSI
Visual Association	ITPA	Word Meaning	MRT
Numbers	MRT[c]	Visual Memory	DARD[e]
Sound Blending	ITPA	Visual Closure	ITPA
Receptive Vocabulary	PPVT[d]	Similarities	WPPSI
Alphabet	MRT	Auditory Reception	ITPA
Auditory Reception	ITPA		
Matching	MRT		

Linguistic Significant Predictor		Linguistic Language Experience Significant Predictor	
Subtest	Test	Subtest	Test
Alphabet	MRT	Numbers	MRT
Picture Completion	WPPSI	Sound Blending	ITPA
Sound Blending	ITPA	Alphabet	MET
Animal House	WPPSI	Auditory Reception	ITPA
Sentences	WPPSI	Picture Completion	WPPSI
Grammatic Closure	ITPA	Information	WPPSI
Matching	MRT	Matching	MRT
Copying	MRT	Manual Expression	ITPA
Visual Reception	ITPA		
Numbers	MRT		
Manual Expression	ITPA		

[a]ITPA = The Illinois Test of Psycholinguistic Abilities
[b]WPPSI = Weschler Preschool and Primary Scale of Intelligence
[c]MRT = The Metropolitan Readiness Test
[d]PPVT = The Peabody Picture Vocabulary Test
[e]DARD = Durrell Analysis of Reading Difficulty

TABLE III

SUMMARY OF SIGNIFICANT (α = .05) PREDICTOR VARIABLES--
YOUNG (1975)

Auditory-Visual Method Significant Predictor		Visual-Auditory Method Significant Predictor	
Subtest	Test	Subtest	Test
Learning Rate	MD[a]	Letter Names II	MD
Grammatic Closure	ITPA[b]	Geometric Design	WPPSI
Sound Blending	ITPA	Learning Rate	MD
Phonemes I	MD	Auditory Association	ITPA
Visual Association	ITPA	Mazes	WPPSI
Vocabulary	WPPSI[c]	Picture Completion	WPPSI
Receptive Vocabulary	PPVT[d]	Visual Reception	ITPA
Geometric Design	WPPSI		
Information	WPPSI		

Linguistic Word Structure Method Significant Predictor		Linguistic-Language Experience Method Significant Predictor	
Subtest	Test	Subtest	Test
Letter Names II	MD	Learning Rate	MD
Learning Rate	MD	Sound Blending	ITPA
Picture Completion	WPPSI	Animal House	WPPSI
Animal House	WPPSI	Visual Memory	ITPA
Sentences	WPPSI	Auditory Reception	ITPA
Auditory Association	ITPA		
Phonemes II	MD		
Grammatic Closure	ITPA		
Auditory Closure	ITPA		

[a]MD = Murphy-Durrell Reading Readiness Analysis
[b]ITPA = Illinois Test of Psycholinguistic Abilities
[c]WPPSI = Wechsler Preschool and Primary Scale of Intelligence
[d]PPVT = Peabody Picture Vocabulary Test

Many public schools in Oklahoma use a battery of tests administered at the end of kindergarten to determine a methods preference for initial placement in a reading program in first grade. The battery is administered to each child and specific method preference scores are indicated by the battery. The battery of tests consist of two standardized readiness tests and predictive subtests from the research by Young and Treadway. Each student's performance scores on the battery are recorded on the Method Preference Worksheet adapted by Ray (1985) (Figure 1). Tests and subtests administered and results recorded on the Method Preference Worksheet include the Illinois Test of Psycholinguistic Abilities (1968 Revision) (three subtests), the Wechsler Preschool Primary Scale of Intelligence (1967) (two subtests), the Metropolitan Readiness Test (1976) (two subtests), and the Murphy-Durrell Reading Readiness Test (1964) (two subtests). This battery of tests was demonstrated to be a predictor of learning preference. (See Appendix A for bibliographic information on instruments used and descriptions of the subtests.)

Method and materials used for initial reading instruction are differentiated based on the methods preference demonstrated by the child. Methods preference is matched to method of instruction to provide a reading program based on the strengths of the learner in which the child can be successful.

Method Preference Worksheet

Name_____ Sex_____ Date Tested: Year___ Month___ Day___

Address_____ Date of Birth: Year___ Month___ Day___

Parent's Name_____ Age: Year___ Month___ Day___

All Values Raw Score

		Student Score	-½ SD			M			+½ SD	+1 SD	Items
VISUAL-AUDITORY											
Murphy-Durrell	Letter Names II (Y-58)	_____	17	18	19	20	21	22	23	25	(26)
Metropolitan	Alphabet (T-55)	_____	11		12	13		14	15	16	(16)
WPPSI	Geometric Design (Y-14)	_____	12		13	14		15	16	17	(28)
Metropolitan	Word Meaning (T-9)	_____	8			9			10	12	(16)
Murphy-Durrell	Learning Rate (Y-5)	_____	8		9	10		11	12	15	(18)
AUDITORY-VISUAL											
Murphy-Durrell	Learning Rate (Y-52)	_____	12		14	16		18	18	18	(18)
ITPA	Grammatic Closure (T-45)	_____	21	22	23	24	25	26	27	28	(33)
WPPSI	Vocabulary (T-14)	_____	24		25	26		27	28	31	(41)
ITPA	Visual Association (T-9)	_____	18		19	20		21	22	24	(42)
ITPA	Sound Blending (Y-6)	_____	22		23	24		25	26	28	(32)
LINGUISTIC-WORD STRUCTURE											
Murphy-Durrell	Letter Names II (Y-70)	_____	17	18	19	20	21	22	23	25	(26)
Metropolitan	Alphabet (T-64)	_____	11		12	13		14	15	16	(16)
Murphy-Durrell	Learning Rate (Y-10)	_____	8		9	10		11	12	15	(18)
WPPSI	Picture Completion (Y-4)	_____	12		13	14		15	16	18	(23)
WPPSI	Animal House (Y-3)	_____	41	42	43	44	45	46	47	48	49	50	51	56	(70)
LANGUAGE EXPERIENCE											
Murphy-Durrell	Learning Rate (Y-63)	_____	12		14	16		18	18	18	(18)
Metropolitan	Numbers (T-64)	_____	11		12	13		14	15	16	(26)
ITPA	Sound Blending (T-17)	_____	22		23	24		25	26	28	(32)
WPPSI	Animal House (Y-3)	_____	41	42	43	44	45	46	47	48	49	50	51	56	(70)
Metropolitan	Alphabet (T-6)	_____	11		12	13		14	15	16	(16)

RAY READING METHODS TEST		REMARKS AND RECOMMENDATIONS
Auditory-Visual (7)	_____	_____
Visual-Auditory (7)	_____	_____
Linguistic Word St. (7)	_____	_____
Language Experience (7)	_____	_____
Intervention (6)	_____	_____

Figure 1. Method Preference Worksheet

Summary

Several investigations have examined the relationship between modality preference and instructional matching. Results of the studies were mixed. While all the researchers established a preferred modality, most of the studies did not show that differentiating instruction according to modality preference does facilitate learning to read. Larrivee (1981) suggests that most measurement devices do not have the necessary reliability to be used in decisions concerning differential assignment of children to instructional programs.

There was very little consistency throughout the studies. There were wide variations in subject variables, procedures, and research designs. Studies varied in the number of modalities they emphasized. Time of methods and treatments ranged from brief sessions of one hour to longitudinal studies of a year or more.

Reading achievement was defined as scores of any of several different measures of reading including achievement tests, reading tests, and scores on word recognition tests.

Wolpert (1971) questions the labeling of methods of teaching reading in accordance with one sensory modality. He suggests that to divide reading methods into auditory and visual classifications is a false dichotomy as well as an oversimplications. The visual methods teach sound-symbol relationships and the auditory methods rely of visual appearances

of certain words for identification. Young and Treadway indicate that the predictor variables listed as most predictive to success with the auditory-visual method of reading are not exclusively auditory or visual tasks. The predictor variables listed as most predictive to success with the visual-auditory method are not exclusively visual or auditory tasks. In their studies, some auditory tests predicted to visual methods of instruction and some visual tests predicted to auditory methods of instruction.

Some researchers suggest that the best way to establish a learner's method preference is through trial lessons in the method to see which method the learner prefers. Researchers have used a battery of tests in order to determine the best predictor of a learning preference. Many researchers recommend continued research to determine the method of learning to read that is the very best for the child so he can be a successful reader.

CHAPTER III

METHOD AND PROCEDURE

Introduction

This study investigated the relationships among reading achievement performances and three methods of reading instruction as determined by methods preference during grade levels one through five. The results were analyzed using a 3x5 factorial analysis of variance with repeated measures on one factor.

Subjects

The subjects for this study were fifth grade students enrolled the 1985-1986 academic year in one public elementary school in North Central Oklahoma. The town is characterized as a predominantly white, middle class community with a highly mobile population. The population is approximately 42,000 people with 23,000 students who attend a university. The average age of the population in the community is 22 years. Major employers are education, manufacturing, and professional services. Ninety percent of the residents are Caucasian. American Indians, Blacks, and people representing cultures from around the world comprise the total population (Wagner, 1986).

The following criteria were met by all students included in the sample used in this study:

1. All subjects had attended one public elementary school during grade levels one through five.

2. All subjects were screened prior to their enrollment in first grade in order to identify their methods preference.

3. All students were provided with a beginning reading program for first grade readers with the method of instruction matched to their established methods preference.

4. Reading instruction was continued in the preferred method throughout grade levels one through five.

5. No subjects were retained during grade levels one through five.

Methodology and Design

The subjects in this follow-up study were administered a battery of tests described by Young (1975) and Treadway (1975) prior to first grade in order to establish a preference for a methodology by two reading specialists employed by the public schools. The tests administered to predict a preference for a method included subtests from the Illinois Test of Psycholinguistic Abilities, the Wechsler Preschool and Primary Scale of Intelligence, the Murphy-Durrell Reading Readiness Analysis, and the Metropolitan Reading Readiness Test. Results from the battery of tests were recorded on Ray's Method Preference Worksheet and students were identified as having an auditory-visual methods preference or a visual-auditory methods preference.

Students scoring consistently lower in all areas on the predictive battery were placed in a method of teaching reading designated as pre-preference. These students did not demonstrate a preference for one of the specific methods based on the criteria established by Young and Treadway.

Children were placed in initial reading instruction based on the learning preference of the child for one of the three methods of reading instruction. Methods and materials of instruction were differentiated in the first grade classrooms based on the methods preference of the learners. Reading instruction was continued in the method of reading instruction as determined by methods preference throughout grade levels one through five.

Materials used for the learners with an established auditory-visual preference were the Keys to Reading Series (Economy, 1980) which stressed phonic presentations. In these materials, the learner must accumulate a number of sound-symbol associations and utilize these in synthesizing and decoding words. Skill transfer is accomplished through use of known sound-symbol associations applied to unknown words.

Materials used for the learners with an established visual-auditory preference were the Bookmark Reading Program (Harcourt, Barce, and Jovanovich, 1974, 1980) or the Reading 720 Rainbow Edition (Ginn and Company, 1980). The skill development program in these materials was dependent upon an accumulation of

sight words from controlled vocabulary which had been presented to the learner in a whole word method.

Children who were placed in the pre-preference method of reading instruction were not ready at the beginning of first grade for the auditory-visual or visual-auditory programs. These children were given extended reading readiness experiences and more time to develop skills necessary to learn to read. Reading lessons in the Bookmark Reading Program (Harcourt, Brace, and Jovanovich, 1974, 1980) were presented after several weeks of intensive skill development. (See Appendix B for bibliographic information on the materials used.)

Sixty-six children received initial reading instruction with methods preference as the basis for providing a differentiated method of reading instruction in first grade. Reading instruction in a method as determined by methods preference was continued throughout grade levels one through five with 27 students comprising the sample at fifth grade due to attrition throughout the grades.

Instrumentation

Reading achievement was measured at the first grade level by the Gates-MacGinitie Reading Test, Level A (1978). At second grade, the Gates-MacGinitie Reading Test, Level B (1978) was administered. At third grade level, the Gates-MacGinitie Reading Test, Level C (1978) was administered. The Gates-MacGinitie

Reading Test, Level D (1978) was administered at fourth grade level and at fifth grade level. Tests were administered in October or May of the school year. The tests yield subtest scores for Vocabulary and Comprehension which are combined to form a Total score.

The Gates-MacGinitie Reading Tests Technical Summary (1981) reports on standardization information and on data on reliability and validity. The Gates-MacGinitie Reading Tests were standardized using norming samples of approximately 5,000 students. The total number of students involved in the standardization testing was approximately 65,000. Norming samples were obtained from a stratified sampling design. The sampling plan stratified school districts on four variables: geographic location, enrollment size, median family income, and years of schooling by the adult population. Representative proportions of Black and Hispanic people were chosen in the sample. A separate sample of Roman Catholic schools was included in the standardization.

The standardization of the Gates-MacGinitie Reading Tests involved equating of test forms and test levels. Equivalent forms of the test were administered at each level. Kuder-Richardson Formula 20 reliability coefficients based on the equivalent forms reliabilities for the Total scores were computed from the standardization sample for each level of the test. The reliability coefficients were: Level A for grade level one was .94, Level B

for grade level two was .93, Level C for grade level three was .93, Level D for grade level four was .92, and Level D for grade level five was .92.

Studies relating the Gates-MacGinitie Reading Tests to the Metropolitan Achievement Test were administered to students in grade level five. A correlation of .92 was reported to provide evidence relevant to the question of construct validity.

Twelve classroom teachers and three reading specialists in the public elementary school the students in the sample attended examined the Gates-MacGinitie Reading Tests and determined that they were valid measures to evaluate reading achievement for students in grade levels one through five.

Statistical Analysis

The statistical analysis was performed using the Oklahoma State University IBM computer. For each grade level one through five, the Extended Scale Score (ESS) was calculated for each child in each of the three methods of reading instruction as determined by methods preference.

To analyze the data, a repeated measures analysis of variance (ANOVA), the Lindquist Type I ANOVA, was used. More specifically, a 3x5 factorial analysis of variance with repeated measures on one factor, grade level, was utilized. An alpha level of .05 was employed. Significant main effects were examined using Tukey's (a) test for score data to identify statistically significant (α = .05) pairwise differences.

Summary

A description of the students included in the sample used in this study was presented. Twenty-seven students who attended one elementary school throughout grade levels one through five and who received a method of reading instruction as determined by methods preference were administered reading achievement tests each year. The relationships among reading achievement performances and method of reading instruction as determined by methods preference during grade levels one through five were investigated. The statistical analysis employed to analyze the data was a 3x5 factorial analysis of variance with repeated measures on one factor. The statistical analysis was performed on the Oklahoma State University IBM computer.

CHAPTER IV

ANALYSIS OF THE DATA

Introduction

The major purpose of this study was to investigate the relationships among the reading achievement performances of students and three methods of reading instruction as determined by methods preference during grade levels one through five. Hypotheses were formulated to test the significance of these relationships.

Analysis of the data was completed to determine the extent of relationship between reading achievement performances of students and method of reading instruction as determined by methods preference. The relationship between reading achievement performances and grade level was also investigated. Further analysis of the data examined the relationship between reading achievement and the interaction of method of reading instruction as determined by methods preference and the grade level of the students. Means and standard deviations of reading achievement for each grade level are presented in Table IV. The analysis of variance summary table is presented in Table V.

Results Related to Hypothesis I

Hypothesis I: Mean reading achievement performance for each of three methods of reading instruction as determined by

TABLE IV

MEANS AND STANDARD DEVIATIONS OF READING ACHIEVEMENT PERFORMANCES

	Grade Level 1	Grade Level 2	Grade Level 3	Grade Level 4	Grade Level 5	All Grade Levels
Reading Method I Auditory-Visual						
M	460.0	514.0	496.8	556.4	586.4	522.7
SD	38.22	33.54	42.23	34.72	18.05	55.14
n = 5						
Reading Method II Visual-Auditory						
M	399.6	459.0	461.8	525.6	552.7	479.8
SD	24.00	49.53	31.10	34.37	42.64	65.34
n = 11						
Reading Method III Pre-preference						
M	352.2	419.2	442.3	493.7	519.6	445.4
SD	51.69	56.84	28.07	48.40	51.14	75.28
n = 11						
Entire Sample						
M	391.5	453.0	460.3	518.3	545.5	
SD	55.30	59.76	36.66	45.80	48.81	
N = 27						

TABLE V

SUMMARY TABLE FOR THE LINDQUIST TYPE I ANOVA

Source	df	SS	MS	F	p
Between subjects	26	243514.46			
Reading methods	2	106088.51	53044.26	9.26	.001
Error-between	24	137425.95	5726.08		
Within-subjects	108	399455.78			
Grade levels	4	319134.76	79783.69	105.43	.000
Reading method x Grade level	8	7670.13	953.76	1.27	.270
Error-within	96	72650.89	756.78		
Total	134	642970.24			

methods preference when averaged across grade levels one through five were drawn from populations having the same means.

Based on the results in Table V, it was determined the null hypothesis should be rejected. If the sample means for method of reading instruction as determined by methods preference (when averaged across grade levels one through five) were drawn from populations with the same mean, the probability of obtaining means as disparate as the ones obtained in the sample would be less than 5%; therefore, the null hypothesis must be rejected.

Since the F ratio was significant, the Tukey's (a) test for specific comparisons was used to determine where differences between pairs of means existed. The critical value used to make the pairwise comparisons was 19.52. Table VI presents the results of the Tukey's (a) test.

The results of the statistical analysis of the data for the three methods of reading instruction as determined by methods preference during grade levels one through five show that the auditory-visual method of reading instruction differs significantly from the visual-auditory and the pre-preference methods of reading instruction. The visual-auditory method of reading instruction differs significantly from the pre-preference method of reading instruction. The auditory-visual method of reading instruction had the highest level of reading achievement performance when scores were collapsed across grade levels one through five. The

TABLE VI

MEANS AND MEAN DIFFERENCES BETWEEN READING METHODS

Reading Method	Auditory-Visual 522.7	Visual-Auditory 479.8	Pre-preference 445.4
Auditory-Visual 522.7	-	42.9*	77.3*
Visual-Auditory 479.8		-	34.4*
Pre-preference 445.4			-

*$p < .05$.

Note: Each value in the body of the table represents the difference between column and row values. In the table presented, any pairwise difference between means that equals or exceeds the critical value for the Tukey test of 19.52 is declared significant by the Tukey test.

visual-auditory method of reading instruction had the second highest level of reading achievement performance and the pre-preference method of reading instruction had the lowest level of reading achievement performance when the scores were collapsed across grade levels one through five. The means for the auditory-visual method of reading instruction showed increase at grade levels one, two, four, and five. The means for the visual-auditory method of reading instruction showed increase during grade levels one, two, three, four, and five. The means for the pre-preference method of reading instruction showed increase during grade levels one, two, three, four, and five.

Results Related to Hypothesis II

Hypothesis II: Mean reading achievement performances for grade levels one through five for each of three methods of reading instruction as determined by method preference were drawn from populations having the same means.

Based on the results in Table V, it was determined the null hypothesis should be rejected. If the sample means for grade levels one through five when averaged across three methods of reading instruction as determined by methods preference were drawn from populations having the same mean, the probability of obtaining means as disparate as the ones obtained in the sample would be less than 5%; therefore, the null hypothesis must be rejected.

Since the F ratio was significant, the Tukey's (a) test for specific comparisons was used to determine where differences between pairs of means existed. The critical value used to make the pairwise comparisons was 20.90. Table VII presents the results of the Tukey's (a) test.

Reading achievement performance scores at grade level five differ significantly from reading achievement scores during grade level four, grade level three, grade level two, and grade level one. Reading achievement performance scores at grade level four differ significantly from reading achievement scores during grade level three, grade level two, and grade level one. Reading achievement scores during grade level three differ significantly from reading achievement scores during grade level one. However, there was no significant difference between scores during grade level three and grade level two. Reading achievement performance scores during grade level two differ significantly from reading achievement scores during grade level one. The means for the sample of students receiving a method of reading instruction showed increase from grade level one to grade level two, increase from grade level three to grade level four, and increase from grade level four to grade level five. Mean reading achievement performance scores during grade levels one through five for students receiving a method of reading instruction as determined by methods preference are converted to grade equivalents and presented in Figure 2.

TABLE VII

MEANS AND MEAN DIFFERENCES BETWEEN GRADE LEVELS

Grade Level	Five 545.5	Four 518.3	Three 460.3	Two 453.0	One 391.5
Five 54.5	-	27.2*	85.2*	92.5*	154.0*
Four 518.3		-	58.0*	65.3*	126.8*
Three 460.3			-	7.3	68.8*
Two 453.0				-	61.5*
One 391.5					-

*p <.05.

Note: Each value in the body of the table represents the difference between the column and row values. In the table presented, any pairwise difference between means that equals or exceeds the critical value for the Tukey test of 20.90 is declared significant by the Tukey test.

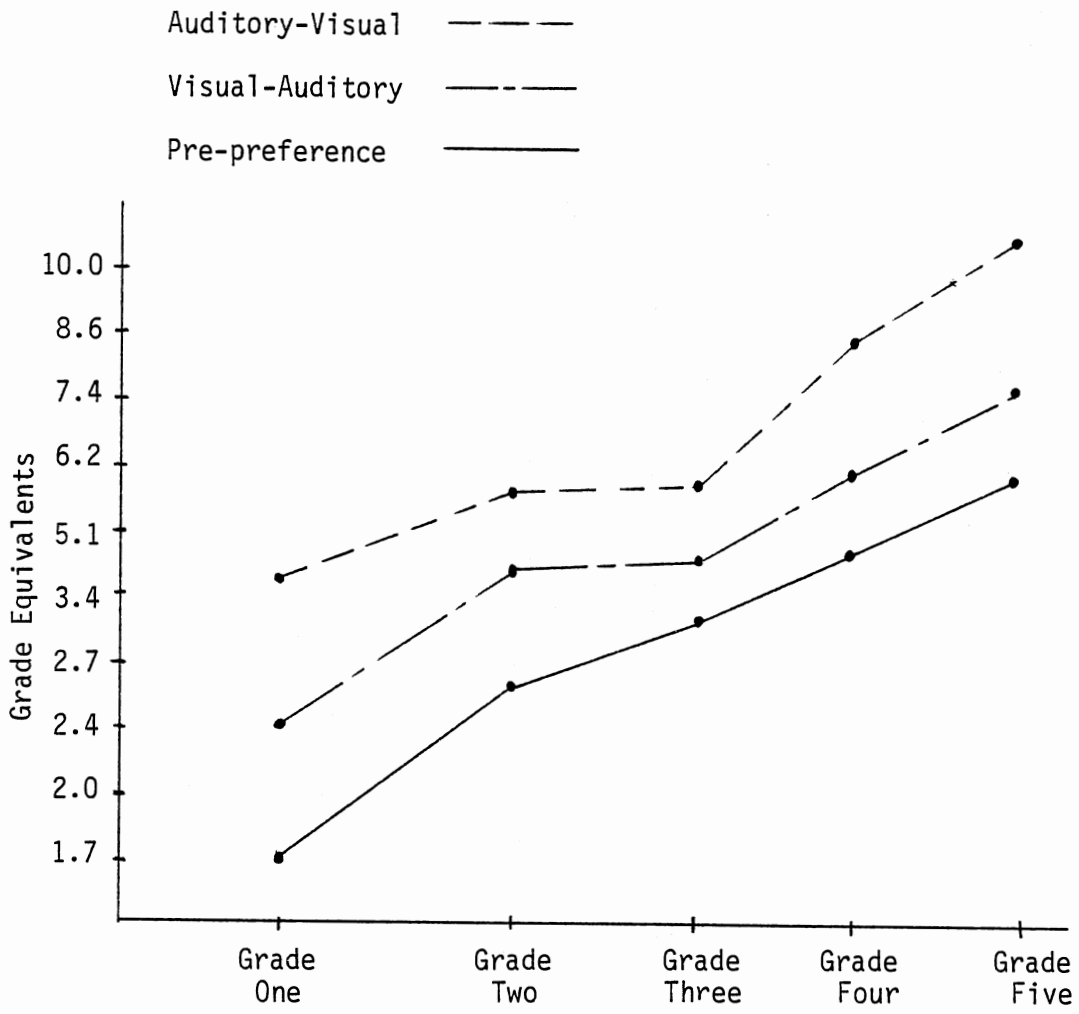

Figure 2. Mean Reading Achievement Performances of Students During Grade Levels One through Five Receiving a Method of Reading Instruction as Determined by Methods Preference

Results Related to Hypothesis III

Hypothesis III: The samples were drawn from populations in which the differences between any two methods of reading instruction as determined by methods preference are the same for grade levels one through five, and similarly, the differences between grade levels one through five's test performance means are the same for each of three methods of reading instruction as determined by methods preference.

Based on the results in Table V, it was determined the null hypothesis should not be rejected. If the sample means were drawn from populations in which the differences between any two methods of reading instruction as determined by methods preference means were the same for each grade level one through five (and the converse), the probability of obtaining differences as discrepant as the ones obtained in the present sample would not be less than 5%. Therefore, the null hypothesis should not be rejected. This indicates that there was not a significant interaction between method of reading instruction and grade level.

Summary

A mixed analysis of variance with three levels of the method of reading instruction as determined by methods preference (between) and give grade levels (within) with repeated measures on one factor (grade level) was performed on these data. Relevant mean scores and standard deviations were presented in Table IV.

The analysis of variance summary table was presented in Table V.

The results indicated that the effect due to method of reading instruction as determined by methods preference was significant ($F = 9.26$, df = 2, $p < .05$). Results of a multiple comparison test to identify which means were significantly different from one another within each group of means was presented in Table VI. Results show that the auditory-visual method of reading instruction differs significantly from the visual-auditory and the pre-preference methods of reading instruction. The visual-auditory method of reading instruction differs significantly from the pre-preference method of reading instruction. The auditory-visual method of reading instruction had the highest level of reading achievement performance when scores were collapsed across grade levels one through five. The visual-auditory method of reading instruction had the second highest level of reading achievement performance and the pre-preference method of reading instruction had the lowest level of reading achievement performance when scores were collapsed across grade levels one through five.

The analysis yielded significant effects due to grade levels ($F = 105.43$, df = 4, $p < .05$). Results of a multiple comparison test to identify which means were significantly different from one another within each group of means was presented in Table VII. Results show that the reading achievement scores at grade level

five differ significantly from scores during grade level four, grade level three, grade level two, and grade level one. Reading achievement scores at grade level four differ significantly from reading achievement scores during grade level three, grade level two, and grade level one. Reading achievement scores during grade level three differ significantly from reading achievement scores during grade level one. However, there was no significant difference between scores during grade level three and grade level two. Reading achievement scores during grade level two differ significantly from reading achievement scores during grade level one. The means for all three methods of reading instruction as determined by methods preference increased from grade level one to grade level two, increased from grade level three to grade level four, and increased from grade level four to grade level five. The interaction between method of reading instruction as determined by methodology preference and grade level was not significant ($F = 1.27$, $df = 8$, $p > .05$).

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

This study investigated the relationships among reading achievement performances and three methods of reading instruction as determined by methods preference during grade levels one through five.

The sample consisted of 27 students who attended one public elementary school during grade levels one through five. All subjects were administered a battery of tests prior to their enrollment in first grade in order to identify their methods preference. All students were provided a method of reading instruction as determined by methods preference during grade levels one through five in either the auditory-visual method, visual-auditory method, or pre-preference method of reading instruction. No students were retained during grade levels one through five. The Gates-MacGinitie Reading Tests (1978) were administered yearly as a measure of reading achievement performance.

A 3x5 factorial analysis of variance with repeated measures on one factor was utilized to analyze the data. This statistical analysis indicated that the main effects of reading method and grade level were statistically significant. The interaction of reading method by grade level was not statistically significant.

Conclusions

The following conclusions may be drawn from the results of the statistical treatment of the data:

1. There is a significant different among the three methods of reading instruction as determined by methods preference. The auditory-visual method of reading instruction differs significantly from the visual-auditory and pre-preference methods of reading instruction. The visual-auditory method of reading instruction differs significantly from the pre-preference method of reading instruction. The auditory-visual method of reading instruction had the highest level of reading achievement performance when scores were collapsed across grade levels one through five. The visual-auditory method had the second highest level of reading achievement performance and the pre-preference method had the lowest level of reading achievement performance when the scores were collapsed during grade levels one through five.

2. There is a significant difference among reading achievement performance scores at grade levels one through five for students receiving a method of reading instruction as determined by methods preference. The reading achievement performances did not remain constant across grade levels one through five. Reading achievement performance scores at grade level five differ significantly from reading achievement

performances during grade level four, grade level three, grade level two, and grade level one. Reading achievement performance scores at grade level four differ significantly from reading achievement scores at grade level three, grade level two, and grade level one. Reading achievement performance scores during grade level three differ significantly from scores during grade level one. However, there was no significant different between reading achievement performance scores during grade level three and grade level two. Reading achievement performance scores during grade level two differ significantly from reading achievement performance scores during grade level one. The means for the entire sample of students receiving a method of reading instruction as determined by methods preference showed increase from grade level one to grade level two, grade level three to grade level four, and grade level four to grade level five.

3. There was not a significant interaction between method of reading instruction as determined by methods preference and grade level. The trend of reading achievement test performance across grade levels one through five is similar for the auditory-visual, visual-auditory, and pre-preference method of reading instruction.

Recommendations

Recommendations are appropriate regarding replication of this study. Many public schools in Oklahoma use the battery of

tests described in this study in order to differentiate reading instruction based on the child's demonstrated preference for a method of reading instruction. Researchers should continue examining the reading achievement performances of students who receive a method of reading instruction as determined by methods preference during grade levels one through five to add information concerning the efficacy of adapting reading instruction, methods, and materials to the methods preference of the child.

It is recommended that further research compare reading achievement performance scores of students who have received a method of reading instruction as determined by methods preference with reading achievement performance scores of students who were not taught with a method of reading instruction based on the strengths of the learner. Researchers should continue working with assessments to identify the method of reading instruction in which the child can learn to read most successfully.

BIBLIOGRAPHY

Arter, J. A. & Jenkins, J. R. (1977). Examining the benefits and prevalence of modality considerations in special education. The Journal of Special Education, 11, 281-298.

Austin, M. C. & Donovan, M. A. (1978, May). Does modality preference make a difference? The results of a three-year study--Literature review. Paper presented at the meeting of the International Reading Association, Houston, TX. (ERIC Document Reproduction Service No. ED 157-026.)

Barbe, W., Swassing, R. H., Milone, M. N., & Kampwirth, T. J. (1981). A forum: Modality strengths. Academic Therapy, 16, 261-266.

Cooper, J. D. (1972). Learning modalities and reading. Individualizing reading instruction: A reader, 115-122.

Derevensky, J. L. (1977). Modal preferences and strengths: Implications for reading research. Journal of Reading Behavior, 10(1), 7-23.

Donovan, M. A. & Austin, M. C. (1978, May). Does modality preference make a difference? The results of a three-year study--Empirical data. Paper presented at the meeting of the International Reading Association, Houston, TX. (ERIC Document Reproduction Service No. ED 157-027.)

Dunn, R., Dunn, K., & Price, G. (1977). Diagnosing learning styles: A prescription for avoiding malpractice suits. Phi Delta Kappan, 58, 418-420.

Foster, G. G., Reese, J. H., Schmidt, C. R., & Ohrtman, W. F. (1976). Modality preference and the learning of sight words. The Journal of Special Education, 10, 253-258.

Hillerich, R. L. (1975, May). Kindergarten screening procedures: Early identification or merely early labeling? Paper presented at the meeting of the International Reading Association, New York. (ERIC Document Reproduction Service No. ED 103-025.)

Jones, J. P. (1971, April). Learning modalities--Should they be considered? Paper presented at the meeting of the International Reading Association, Atlantic City, NJ. (ERIC Document Reproduction Service No. ED 052-899.)

Kampwirth, T. J. & Bates, M. (1980). Modality preference and teaching method: A review of the research. Academic Therapy, 16, 597-605.

Keogh, B. K. (1976-1977). Early ID: Selective perception or perceptive selection? Academic Therapy, 12, 267-274.

Larrivee, B. (1981). Modality preference as a model for differentiating beginning reading instruction: A review of the issues. Learning Disability Quarterly, 4, 180-188.

MacGinitie, W. H., Kamons, J., Kowalski, R. L., MacGinitie, R. K., & MacKay, T. (1978). Gates-MacGinitie Reading Tests. Chicago, IL: The Riverside Publishing Company.

MacGinitie, W. G., Kamons, J., Kowalski, R. L., MacGinitie, R. K., & MacKay, T. 1981). Gates-MacGinitie Reading Tests Technical Summary. Chicago, IL: The Riverside Publishing Company.

Manwarren, M. I. (1973). A validity study of the Ray Reading Methods Test. (Doctoral Dissertation, Oklahoma State University, 1972.) Dissertation Abstracts International, 33A, 6775-A.

Miller, E. (1974, April). Modality preference instructional method and reading achievement with first graders. (Final Report.) Albany, NY: State University of New York. (ERIC Document Reproduction Service No. 172-181.

Miller, E. (1979). First grade reading instruction and modality preference. The Elementary School Journal, 80, 98-104.

Ray, D. (1970). Ray Reading Methods Test. Unpublished manuscript. Stillwater, OK: Oklahoma State University.

Ray, D. (1984). Method Preference Worksheet. Unpublished manuscript. Stillwater, OK: Oklahoma State University.

Ringler, L. H., Smith, I. L., & Cullinan, B. E. (1971, April). Modality preference, differentiated presentation of reading tests, and word recognition of first grade children. Paper presented at the meeting of the International Reading Association, Atlantic City, NJ. (ERIC Document Reproduction Service No. ED 052-901.)

Robinson, H. M. (1972). Visual and auditory modalities related to methods for beginning reading. Reading Research Quarterly, 8, 7-39.

Smith, C. M. (1971). The relationship of reading method and reading achievement to ITPA sensory modalities. The Journal of Special Education, 5(2), 143-149.

Smith, I. & Ringler, L. (1971). Preferred sensory modality, reading readiness, and reading achievement in first-grade children. Perceptual and Motor Skills, 32, 764-766.

Tarver, S. G. & Dawson, M. (1978). Modality preference and the teaching of reading: A review. Journal of Learning Disabilities, 11(1), 17-29.

Treadway, K. A. (1975). The relationship between pre-reading patterns of behavior and success with specific reading methods of kindergarten children. (Doctoral Dissertation, Oklahoma State University, 1975.) Dissertation Abstracts International, 36-A, 7193-A.

Vandever, T. R. & Neville, D. D. (1974). Modality aptitude and word recognition. Journal of Reading Behavior, 6, 195-201.

Wagner, T. (1986). Community profile and identification of assets for new and expanding industry. Stillwater, OK: author.

Waugh, R. P. (1973). Relationships between modality preference and performance. Exceptional Children, 39, 465-470.

Wepman, J. M. & Morency, A. S. (1975). Perceptual development and learning: An experimental study on modality reading instruction. (Section II: Final Report.) Chicago, IL: Chicago University. (ERIC Document Reproduction Service No. ED 125-164.)

Wolpert, E. M. (1971). Modality and reading: A perspective. The Reading Teacher, 24, 640-643.

Young, D. J. (1975). The relationship between pre-reading behavior patterns and success of specific reading methods with kindergarten children. (Doctoral Dissertation, Oklahoma State University, 1975.) Dissertation Abstracts International, 36-A, 7195-A.

APPENDIXES

APPENDIX A

INSTRUMENTS

Kirk, S., McCarthy, J., & Kirk, W. (1968 Revision). Illinois Test of Psycholinguistic Abilities. Champaign, Illinois: University of Illinois Press.

Grammatic Closure--This subtest assesses the child's acquisition of automatic habits for handling syntax and grammatic inflections. This subtest consists of a demonstration item and 33 test items. The child sees 2 line drawings side by side. The administrator points to the drawing on the left and makes a statement about the object. The administrator then points to the diagram on the right using an incomplete statement. This child is required to provide the missing word (e.g., Here is a bed, here are two _____.).

Visual Association refers to the ability to relate visually received stimuli in a meaningful way. The subtest consists of demonstration items and 42 test items. Each item consists of 5 line drawings, one object within a center circle and one of the remaining objects in each of 4 corners of a surrounding rectangle. The child is required to indicate which of the 4 alternate drawings most meaningfully relates to the object in the circle. Items increase in difficulty. Testing continues until the child fails 3 consecutive items.

Sound Blending measures the child's ability to produce an integrated whole word after hearing the single sounds in the word. Sounds are spoken singly, one every half second. Items increase in difficulty and include both English words and nonsense words (e.g., D_OG, child says "dog"). This supplementary subtest includes demonstration items and 32 test items. The first 7 items are used with pictures. The last 8 items are nonsense words and demonstrate nonsense words are presented before these items are given. Testing on English words stops when the child fails 3 consecutive items. If the third consecutive error occurs after item 18, the administrator continues testing using nonsense words until the child fails 3 consecutive nonsense items.

Murphy, H. & Durrell, D. Murphy-Durrell Reading Readiness Analysis. New York: Psychological Corporation.

Learning Rate Test. The Learning Rate Test assesses the students' ability to learn and recognize nine sight words. The nine words in the Learning Rate Test include nouns, verbs and adjectives which are all meaningful to children and easily illustrated. The words are taught in a systematic way by presenting them on a chalkboard, on flash card, and in the test booklet. In all three situations in which the words are presented to the child, meaning is also emphasized. One hour after teaching, students are asked to identify the words in two multiple choice situations. The first requires the child to discriminate the word

from other words taught. The second requires discrimination among words similar in form, but not taught. The purpose of the Learning Rate Test is to determine the number of words that a child is able to learn in one day under standard conditions of presentation.

Letter Names II Test. The purpose of the Letter Names II Test is for the child to identify letters named by the teacher. This test measures knowledge of letter names.

Nurss, J. & McGauvran, D. (1976). Metropolitan Readiness Tests. New York: Psychological Corporation.

Alphabet. This subtest tests the child's ability to recognize lower case letters of the alphabet.

Word Meaning. This is a sixteen item picture vocabulary test. The child selects from pictures the one that illustrates the word the examiner names.

Wechsler, D. (1967). Wechsler Preschool and Primary Scale of Intelligence. New York: Psychological Corporation.

Geometric Design. The subject is presented with a stimulus picture of a geometric design and is asked to reproduce the design with a pencil. The test measures the child's ability to reproduce geometric figures and looks at the visual-motor organization and calls attention to behavioral lags of the child.

Vocabulary. The examiner gives oral stimulus and the subject responds orally with word definitions. This subtest serves to suggest a level of auditory comprehension.

APPENDIX B

MATERIALS

Bookmark Reading Program (1974, 1980). Orlando, Florida: Harcourt, Brace, and Jovanovich.

Keys to Reading Series (1980). Oklahoma City, Oklahoma: The Economy Company.

Reading 720 Rainbow Edition (1980). Columbus, Ohio: Ginn and Company.

VITA

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Doctor of Education

Thesis: THE READING ACHIEVEMENT OF STUDENTS DURING GRADE LEVELS ONE THROUGH FIVE RECEIVING A METHOD OF READING INSTRUCTION AS DETERMINED BY METHODS PREFERENCE

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