1-1-1980

The Effects of a Perceptual-motor Physical Education Program on Reading Skill Level of First-grade Students

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THE EFFECTS OF A PERCEPTUAL-MOTOR PHYSICAL EDUCATION PROGRAM ON READING SKILL LEVEL OF FIRST-GRADE STUDENTS

A Thesis

Presented to

the Faculty of the Graduate School

Marshall University

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

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by

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July 1980

THIS THESIS WAS ACCEPTED ON August 10, 1981
Month Day Year

as meeting the research requirement for the Master's degree.

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Chapter 1

INTRODUCTION

For many years, educators have been intrigued and concerned with the relationships that exist between a child's physical development and cognitive development. Even though some researchers and authors have reported that improvement in motor ability in young children is accompanied by improvement in cognitive ability (5,12,26,28), others have found no significant relationships between these two parameters (3,24,45,47). Therefore, the research to date has generated both excitement and skepticism, resulting in increased interest in the development of perceptual-motor training programs (13,26,31), as well as renewed committment to traditional physical education programs (14,36).

Statement of the Problem

Based upon the observation that there exists both "excitement" and "skepticism" in education with respect to relationships between a child's motor and cognitive abilities, it was the scope of this study to investigate the effects of a perceptual-motor physical education program on reading skill level and perceptual-motor skill level of first-grade children. Because many authors (18,20,29) have

also emphasized the importance of visual perceptual abilities in the development of reading skills, another aspect of this study was to determine the singular and combined effects of a visual perceptual training program and a perceptual-motor physical education program on reading skills and perceptual-motor skill levels.

Hypothesis

Two hypotheses were researched in this study. The primary hypothesis was: The means of the reading skills test scores are equal for each of the four treatment groups. The secondary hypothesis dealt with the correlations between perceptual-motor skills and reading skills and stipulated that the r values for each of the four treatment groups are equally significant.

Definition of Terms

For the purpose of this study, the following terms have been operationally defined.

Perceptual-motor physical education. A physical education curriculum based upon perceptual-motor programs and concepts of Cratty (13) and Kephart (26).

Traditional physical education. A program of elementary physical education activities based upon the recommendations of Dauer and Pangrazi (14).

Visual perceptual training program. A series of supplemental activities based upon the programming and concepts of Frostig (19) and McLeod (29), which were used to train the visual perception mechanism.

Basic Assumptions

For the purpose of this study it was assumed that the programs upon which the treatments were based were representative of the basic philosophies that exist in each of those areas of education. It was also assumed that administering the treatment programs during the public school day would maximize attendance of the subjects due to specific policies for attendance already in existence in the county educational system.

Delimitations

To control the scope of this study, the following considerations were made:

1) The study involved first-grade students only, even though most of the research in the area of perceptual-motor programming includes kindergarten through second-grade children.

2) The criteria for measuring "academic skill" dealt with reading skills only, in order to restrict the amount of testing time as well as to simplify the grouping procedures.

3) The perceptual-motor skills battery was limited to seven subtests that were selected to serve as both a comprehensive and practical battery for assessing perceptual-motor skill levels.

Limitations

The following limitations were inherent in the design of this study:

1) Only one aspect of "academic ability", that of reading skill, was evaluated.

2) The perceptual-motor battery utilized several subjective rating scales. Since all subjective evaluation is subject to some inherent variation, even when one consciously attempts to eliminate that variance, care should be exercised in drawing conclusions from the findings.

Chapter 2

BACKGROUND OF THE STUDY

Educators are continually searching for new instructional methods directed toward the facilitation and enhancement of the human learning process. Most authors agree that learning can be defined as a relatively permanent change in one's performance or behavioral tendencies due to many variables, including practice and past experience (16,44,51). Learning is obviously a complex interaction of many variables, a process which can be generalized for all individuals, as well as a process which can be considered unique to each individual. Even though educators often discuss this uniqueness, programs and methodologies do not always reflect those convictions. In fact, schools often attempt to accommodate individual differences based on administrative expediency, resulting in superficial treatment.

Consequently, there is a need for programs and teaching strategies which allow for individualized learning opportunities and yet are practical and feasible within the guidelines of specific monetary and administrative policy. This chapter will present the data and information that was utilized in the development of the experimental program.

Effects of Perceptual-Motor Training Programs

Piaget (51) has stated that growth involves development, a process which he referred to as genuine learning. Gesell (51) has pointed out that physical maturation is the most important factor in one's development. Both of these noted child psychologists place a great deal of emphasis on the physical aspects of human growth and development as they relate to the cognitive learning process. For many years the interest in study and research of the interactions between physical and cognitive processes and skills has been evident. As Bolen (5,p.10) has stated:

> The child's ability to engage successfully in higher mental processes depends greatly upon the extent and degree that lower forms of experiences have been meaningful for him. Consequently, a deficient background in motor and/or perceptual development may hinder the child from engaging in and profiting from higher level symbolic activities.

Kephart (26) is one of the contemporary child developmentalists who has voiced whole-hearted support for the use of perceptual-motor training to enhance a child's cognitive functioning.

Realizing that meaningful and stimulating environmental experiences are essential to the development of perceptual and motor abilities, which have previously been identified as important variables in the organization of higher mental processes, many researchers have studied the relationships of perceptual-motor ability and cognitive ability in hopes of discovering ways to enhance the

learning process in children. Cahn and Hodges (7,p.335) added their support for varied and stimulating environmental experiences by stating, "There is correlation between the nervous system's maturation, purposeful environmental stimuli, and the motor response."

In studying the possibility of reading improvement with perceptual-motor training, McCormick, et al. (28,p.633) found that a perceptual-motor training program would be a very useful component of both the physical education and general school curriculum by "increasing the child's capacity for academic achievement." Many other studies have indicated similar results (9,10,12,33,36). Perceptual-motor training programs have been found to be highly correlated with improvement in academic ability, as measured by reading readiness. For example, Cobb, et al. (12) found a significant correlation between perceptual-motor ability and overall academic ability in children of kindergarten age through second-grade, as measured by the Otis-Lennon Mental Ability Tests.

In a dissertation by Joseph Now (31), in which an analysis of certain perceptual-motor measures and reading performance was undertaken for early elementary children, it was found that a significant positive correlation existed. Such positive correlations have also been suggested by several other researchers (15,17,42,48).

Along with these reported significant correlations, it has also been reported that there is a decrease in the

magnitude of their values as children grow older. More specifically, Thomas and Chissom (46) found decreasing correlations between perceptual-motor ability and intellectual ability, as measured by the Otis-Lennon Mental Ability Test, in children of kindergarten age through the third-grade. They reported strong relationships between academic ability and perceptual-motor ability in kindergarten and first-grade children. However, this relationship decreased with age until there was no significant relationship at all by the third-grade. Singer and Brunk (45,p.969) reported similar findings and stated, "Perhaps the largest relation between perceptual-motor variables and verbal materials appears early in childhood. With age, achievement becomes more task specific."

Belka (4), in a study on pre-kindergarten and first-graders dealing with perceptual-motor and cognitive skills even found decreasing significance with age in those very early years. He stated that perceptual and perceptual-motor skill performance for pre-kindergarten children is useful in predicting cognitive skill performance in kindergarten. However, earlier cognitive performance is a more valid indicator of later cognitive skill performance for the older children in the study.

Tucker (48) found significant correlations between perceptual-motor and cognitive development for a population of first- through fourth-graders. When the group was divided into grade levels, however, there was significance

for the first- and second-graders, but not for the third- and fourth-graders.

Although many researchers have found significant relationships between academic and perceptual-motor ability, others have found no significant relationships between these two parameters. Baker (3,p.41) stated, "There is little research which establishes beyond doubt that perceptual training directly increases reading test scores of groups of children." An interesting observation dealing with the specificity of the various parameters that have been discussed thus far has been made by Trussell (47,p.389).

> ...although perceptual, motor and reading functions develop in a somewhat parallel manner, each of the variables has considerable specificity unto itself. Thus, the results of the factor analysis would not support the theory that perceptual-motor development is of paramount importance as a basis of reading achievement level in first-and second-grade children.

Singer and Brunk (45) also indicated their data revealed tendencies toward specificity in abilities.

O'Connor (32,p.708), in a study of selected physical activities and their effects upon motor performance, perceptual performance and academic achievement stated,

> The conclusion drawn from this study is that change in gross motor ability elicited by the Kephart-type gross motor activities does not necessarily effect change in perceptual or academic ability of the average first-grader.

Singer and Brunk (45,p.967) also stated, "...but a general appraisal of the data indicates specificity of abilities." Jones (24), although finding no increase in academic readiness skills did report gains in perceptual-motor

ability after a treatment program of perceptual-motor orientation. Lipton (27) also reported an increase in perceptual-motor ability due to a specific perceptual-motor training program.

One could possibly assume that a perceptual-motor training program would improve the perceptual-motor skill level of those participating in the program. However, several studies have shown that a perceptual-motor program did not improve skill level any more significantly than a conventional physical education program (21,38,42).

Much of the research done with perceptual abilities and intellectual achievement has dealt with learning disabled children. Cratty (13), one of the leading authors in the field, has stated that significant relationships and differences exist in motor skill ability level between learning disabled and non-disabled children.

Bruininks and Bruininks (6,p.1135) found significantly lower scores in fine motor, gross motor composite and total test performance in learning disabled children. "Learning disabled students evidenced greatest deficiency on tests requiring body equilibrium, controlled fine visual-motor movement, and bilateral coordination of movement involving different parts of the body." Wilson also discovered that perceptually handicapped children learned at slower rates with less recall than non-handicapped children.

> Their slower learning may have been produced by weaknesses in verbal mediation, raising the possibility that language contributes to their limited academic progress and thus also underlies the reported correlations between school achievement and perceptual-motor scores (50,p.935).

Saphier (40) has also recognized the importance of perceptual skills and learning ability. The study indicated that perceptual assessments are useful, at least at the kindergarten level, not only to identify possible learning problems, but also to guide curriculum to areas of weaknesses in children.

Potts and Leyman (34), while studying the effects of a motor training program on reading ability of first- and second-grade slow readers found that although there was some gain in reading achievement after the treatment program, the gains were no greater than for a program of extra reading activities. They also noted a decrease in the effects of the motor training program in the second-grade group as compared with the first-grade group. They concluded that, "The slower progress of second-graders probably indicates an increasingly inadequate base for later stages of reading acquisition" (34,p.205).

In summary, although many of the researchers in this review have reported improvement in cognitive skills following treatments of perceptual-motor orientation, many others have indicated insignificant gains and/or gains that were no more significant than those obtained in a regular program of physical education. Similarly, the research is

divided as to whether or not a perceptual-motor program will even enhance a child's perceptual-motor skill level more than a conventional physical education program. These divided findings leave the educator with many questions about the motor and cognitive domains, their interactions and implications for educational programming.

Effects of Visual-Perceptual Training Programs

The importance of visual perception upon academic achievement, as measured by reading skill, was also an area of concern in this study. Two of the more influential researchers in the area of visual perception training have been Frostig, whose programs of visual perception have been used in a variety of settings for many years, and Getman, a noted optometrist. Getman has stated, "...perception, primarily visual perception, can be developed through motor training" (2,p.27). Both of these individuals have been leaders in the area of visual-perceptual research, and have generated much interest and further research with that aspect of development and learning. As with studies on perceptual-motor programs, however, the research dealing with visual-perceptual programs and academic achievement is inconclusive.

Keim (25), for example, attempted to determine whether a visual-motor training program would affect the readiness and intelligence of kindergarten children. The

results of his specific study indicated that there was no significant difference between the experimental group and the traditional kindergarten program when they were compared on intelligence and readiness at the end of a year long study.

> While findings of this study indicated that intensive visual-motor training provided through the medium of the Winter-Haven Program did not result in significant gains in readiness for learning scores and measured intelligence and did not completely eliminate visual-motor deficiences, the teachers of the experimental group reported significant behavioral changes accrued in some children and that many positive group responses were noted that could not be evaluated by the tests administered (25,p.258-259).

Chang and Chang (8) on the other hand, noted that relationships between one's visual-motor development and reading achievement was positive and significant in the pupils they had grouped in their study as gifted.

Rosen (39), like Keim (25), found no significant relationship between visual-perceptual training and reading achievement among first-grade students. He did find, however, that a visual-perceptual training program did enhance the specific perceptual areas that were trained.

Georgia Pitcher-Baker (3), in her article, "Does Perceptual Training Improve Reading?", stated several times that perceptual training will improve the skills specifically worked on, but that those skills do not have significant relationships with reading or academic achievement. "Isolated skills, treated in isolation, will yield isolated responses and not integrated, generalized behaviors

necessary for reading" (3,p.43). Although she does not feel that there is a significant relationship between perceptual skills and reading achievement, she does state, "...perceptual training is worthwhile when it is viewed as a part of the development in the hierarchy of learning. It strengthens processes and increases information basic to successful reading" (3,p.44).

Looking to the possibility of enhancing visual perception through perceptual-motor programs, Lipton (27) found that a perceptual-motor training program improved not only perceptual-motor development, but also enhanced visual perception. Jones (23), in a study on facilitation of visual perception, found that voluntary movement did facilitate visual perceptual ability at a more significant level than a "no-movement" and a "passive-movement" treatment.

In addition to visual training programs, some research has advocated the use of motor programs to offer specific help to children experiencing reading difficulties. Frostig (18) is one who advocated the use of both visual and motor training as important aspects of any reading program.

Ciani and Klenke (11) have voiced their belief in motor development as an integral part of sound reading programs. The main areas of the psychomotor domain they feel necessary to a sound base for reading are those concepts of space, laterality, directionality, following directions and

self-concept. Likewise, Humphrey (22), while advocating the use of creative movement in the teaching of reading, emphasizes the importance of both auditory and visual perception to successful movement and reading.

It appears that although a great deal of research has been undertaken in recent years to determine the effects of perceptual-motor training and visual-perceptual programs on cognitive abilities in children, the information provided is less than conclusive. Depending upon the particular research study one may read of both positive correlations and no correlation between the variables of interest. In light of these divided findings this study has attempted to make a sound determination of the relationships between reading skill level and visual-motor and perceptual-motor training programs for first-grade children.

Chapter 3

PROCEDURE

This chapter will present the methods utilized in selection and grouping of subjects, testing guidelines, treatment administration, research design, and analysis of the collected data.

Selection of Subjects

The total enrollment of first-grade students at Buffalo Grade School in Logan County, West Virginia, served as the population from which the subjects for this study were chosen. Because of the transient nature of this predominately coal mining community, there was a high risk that a few of the children would be transferring to another area during the course of the study. Therefore, two of the total 52 first-grade students, identified as "high risk movers", and two other students who were not given parental permission to participate in the study were not included in the population used for treatment grouping and data collection. These students were, however, included in the physical education treatments as they could not be eliminated from the physical education requirements from the county board of education. The remaining 48 students were tested

prior to beginning the treatment programs on reading skill and perceptual-motor skill.

Research Design

The design used in this study was a two-way randomized block analysis of data. A randomized block was chosen to eliminate possible effects of pre-reading skill level on reading skill post-test scores for each student involved. The subjects were randomly assigned a treatment group to eliminate any investigator bias.

Using pre-test scores for reading skill, the subjects were blocked into groups of four. One subject from each block was then randomly assigned to each of the four treatment groups. The treatment groups consisted of the following: 1)a traditional physical education program only (P_1V_1), 2)a traditional physical education program supplemented with a visual-perceptual program (P_1V_2), 3)a perceptual-motor physical education program only (P_2V_1), and 4)a perceptual-motor physical education program supplemented with a visual-perceptual program (P_2V_2)..

Description of Tests

Each subtest of the perceptual-motor battery was chosen to measure specific qualities of a child's physical movement skill based upon perceptual abilities. A brief description and purpose for each subtest follows.

1.Walking board. The walking board subtests

consisted of having a child walk forward, backward, and sideward, both directions, on a four-inch flat surface. This test was chosen to determine the general balancing ability of the child.

2. Imitation of movements. This subtest involved a series of 17 different arm movement patterns in which a child, facing the examiner, was required to imitate his movements. This subtest evaluated the child's ability to translate visual clues into specific movements, as well as spatial awareness and neuromuscular control.

3. Angels-in-the-snow. With a child lying on a mat on his back, arms at sides and legs together, the examiner goes through a series of instructions for ten tasks of arm and leg movements. The child's actions were used as indication of his state of neuromuscular control and ability to differentiate between sides of the body through visual clues.

4. Chalkboard tests. This test was actually four tests in which the child was asked to perform various tasks at a chalkboard. The first task involved the child in drawing a circle. In the second task, the child was asked to draw two circles simultaneously, one with each hand. The third task required drawing a line between two "x's" marked on the board about 26 inches apart and shoulder level to the child. Finally, the fourth task required the child to draw two vertical lines simultaneously, one with each hand from each of two "x's" placed high enough on the

board so the child had to extend his arms overhead. These various tasks evaluated possible problems with directionality, and ability to match visual control and motor performance.

5. Visual achievement forms. In this subtest, the child was asked to copy five or seven geometric forms, depending upon his age at the time of testing; a circle, cross, triangle, square, divided rectangle, horizontal diamond, and vertical diamond. Two areas of perception were evaluated, form perception and organizational patterns.

6. Target throwing. This subtest was borrowed from Arnheim (2) and his work with perceptually handicapped children. It involved having a child throw nine three-inch bean bags at a wall target 10 feet away. The target was made up of three squares, a 12-inch outer square valued at one point, an eight-inch square valued at two points, and an inner four-inch square valued at three points. The target throwing subtest evaluated the child's eye-hand coordination and throwing pattern.

7. Shape-O-Ball. This subtest involved the use of a commercially produced hollow plastic six-inch sphere which had 10 different geometrically shaped holes. There were also 10 plastic shapes to correspond to each hole in the sphere. The child was required to place the shapes into the correct holes as quickly as possible. Two timed trials were allowed, with the average of the times taken as the final score. Form perception and manipulative skill were

evaluated.

The reading skills test utilized was the Metropolitan Reading Readiness Survey, Level II, Form P (35). This survey consisted of eight subtests, two based upon auditory skills, two upon visual skills, two upon language skills, and two based upon quantitative skills.

Administration of Tests

The perceptual-motor battery was administered by the researcher with the exception of the Shape-O-Ball test which was administered by a Title I Aide from the school. The specific instructions and testing protocol for the five subtests from the Purdue Perceptual-Motor Survey were obtained from the PPMS handbook (37). The target throwing test followed the instructions explained in the description of tests section of this chapter. A sample score sheet for the perceptual-motor test battery can be found in Appendix A.

The reading skills test was also administered by the researcher, following the instruction manual for the Metropolitan Test (35). The children who were absent on the day of the testing were tested by a Title I Aide upon their return to school. Both the perceptual-motor battery and the reading skills test were given prior to and after administration of the treatment programs.

Analysis of Data

Through manipulation of the independent variables, traditional physical education versus perceptual-motor physical education and supplemental visual-perceptual training, this study attempted to determine their effects upon two dependent variables, reading skill level and perceptual-motor skill level. Two statistical tests were applied to the collected data. A two-way randomized block analysis of variance was used to determine whether significant differences existed among treatments. A simple linear correlation was used to determine whether or not there was significant correlation between the two dependent variables of interest.

Chapter 4

ANALYSIS OF THE DATA

This chapter will attempt to present and discuss the results of the statistical analysis of the data obtained through pre- and post-testing of reading skills and perceptual-motor skills. Of primary interest will be the results of the statistical analyses, with secondary consideration to percentages of improvement in the perceptual motor skill levels and reading skill levels.

Reading Skill Analysis

The complete results of the pre-testing for reading skills can be found in Table V, Appendix B. Results for the post-testing for reading skills can be found in Table VI, Appendix C. It should be noted that the composite raw score of the reading skills test was used in the analysis of the treatment programs and their relationship to reading skill level. The last two subtests of the Metropolitan Test were not included in the analysis of the data because they were based upon the child's knowledge of quantitative concepts rather than actual reading skill.

In order to statistically analyze the effect of the treatments on reading skill, a two-way analysis of variance as suggested by Weber and Lamb (47) was applied to the test

results. An alpha value of .05 was chosen as the level of significance in this study. The results of the ANOVA are contained in Table I. By comparing these obtained F values with the tabled F values ($F(1,44) = 4.06$), at the .05 level of significance, one can see that there was no significant difference between treatments or their interaction and their effect on reading skill level of the students in the study. Therefore, one may not reject the primary null hypothesis, that the means of the reading skill test scores are equal for each of the four treatment groups.

Of secondary interest in the analysis of this data was the improvement between pre- and post-test reading scores for the population as a whole. The summary of pre- and post-test scores can be found in Table II. Taken as a whole, there was a 10 percent improvement on the reading skills test. Without statistical analysis, one might assume that one or more of the treatment programs had a positive effect on reading skills of these children. However, based on the results of the ANOVA, one must conclude that overall improvement in reading scores was not due to any of the specific treatments.

Perceptual-Motor Skill Analysis

The second aspect of this study involved looking at perceptual-motor skill levels of the population as determined by the perceptual-motor battery previously described. The complete results of the perceptual-motor pre-test

TABLE I

SUMMARY OF ANALYSIS OF VARIANCE
OF READING SCORES

SOURCE OF VARIATION	SS	DF	MS	F
Physical Education Treatment	10.8	1	10.8	.0919
Visual-Perceptual Treatment	3	1	3	.0273
Physical Education x Visual-Perception	200.08	1	200.08	1.825
Error	4821.84	44	109.58	
Total	5035	47		

TABLE II

READING SKILL PRE- AND POST-TEST
TOTALS AND AVERAGES FOR
FIRST-GRADE STUDENTS
BUFFALO GRADE SCHOOL
SPRING, 1981

TEST	AGE	AUDITORY			VISUAL			LANGUAGE			COMPOSITE		QUANTITATIVE		
		T_1	T_2	TOT	T_1	T_2	TOT	T_1	T_2	TOT	RAW	PER.	T_1	T_2	TOT
PRE-TEST TOTALS		456	607	1063	328	615	943	320	285	605	2613	2834	235	506	741
AVERAGES	7.0	9.5	12.6	22.1	6.8	12.8	19.6	6.7	5.9	12.6	54.4	59.0	4.9	10.5	15.4
POST-TEST TOTALS		510	673	1183	395	677	1072	366	343	709	2964	3675	271	559	830
AVERAGES	7.2	10.6	14	24.6	8.2	14.1	22.3	7.6	7.2	14.8	61.8	76.6	5.6	11.6	17.2

scores can be found in Tables VII through X in Appendix D. Likewise, the complete results for the post-test scores for the perceptual-motor battery can be found in Tables XI through XIV in Appendix E.

To analyze the data obtained from the perceptual-motor battery, simple linear correlations to determine relationships between perceptual-motor skill level and reading skill level were derived. The results of the six simple linear correlations are contained in Table III. The highest coefficient of correlation (r=.78) was obtained when comparing Shape-O-Ball scores and post-reading scores. This r value indicates a fairly high correlation between these two measures. The walking board as compared to reading scores showed a modest correlation (r=.68). The r values for the remaining four comparisons ranged from .533 to .185, very modest to slight correlations. It is interesting to note that treatment group P_1V_1 (traditional physical education only) had the highest coefficient of correlation values for five of the six correlations determined.

Table IV presents a summary of the perceptual-motor pre- and post-test results for the population as a whole. As with the summary of reading skills in Table II, one must be careful in drawing conclusions from a superficial overview of the information provided there. Looking to this summary, one can see that the testing population improved one percent on the five subtests of the Purdue

TABLE III

SUMMARY OF CORRELATIONS BETWEEN SELECTED PERCEPTUAL-MOTOR TEST SCORES AND READING TEST SCORES FOR EACH TREATMENT GROUP

AREAS OF EVALUATION	P_1V_1	P_1V_2	P_2V_1	P_2V_2	OVERALL
Reading Comp. and Shape-O Ball Test	.876	.597	.772	.814	.78
Reading Comp. and Walking Board Tests	.8715	.795	.36	.528	.658
Reading Comp. and P-M Battery Core (5 Sub-tests)	.93	.213	.432	.646	.533
Reading Comp. and Form Perception	.7576	.18	.244	.5859	.368
Reading Comp. and Chalkboard Tests	.762	.1109	.373	.1059	.3528
Reading Comp. and Target Throwing	.1037	.137	.06	.36	.185

TABLE IV

READING SKILL PRE- AND POST-TEST
TOTALS AND AVERAGES FOR
FIRST-GRADE STUDENTS
BUFFALO GRADE SCHOOL
SPRING, 1981

TEST	AGE	AUDITORY			VISUAL			LANGUAGE			COMPOSITE		QUANTITATIVE		
		T_1	T_2	TOT	T_1	T_2	TOT	T_1	T_2	TOT	RAW	PER.	T_1	T_2	TOT
PRE-TEST TOTALS		456	607	1063	328	615	943	320	285	605	2613	2834	235	506	741
AVERAGES	7.0	9.5	12.6	22.1	6.8	12.8	19.6	6.7	5.9	12.6	54.4	59.0	4.9	10.5	15.4
POST-TEST TOTALS		510	673	1183	395	677	1072	366	343	709	2964	3675	271	559	830
AVERAGES	7.2	10.6	14	24.6	8.2	14.1	22.3	7.6	7.2	14.8	61.8	76.6	5.6	11.6	17.2

Test, five percent on the target throwing, and an average of 15.13 seconds on the Shape-O-Ball test.

Chapter 5

SUMMARY, DISCUSSION AND CONCLUSIONS

The purpose of this study was to analyze the effects of two different physical education programs and a visual-perceptual program on reading skill level of first-grade students. Secondarily, this study attempted to determine whether or not significant correlations existed between selected perceptual-motor skills and reading skills of first-grade children. Based upon the findings of this study this chapter will attempt to discuss the results and their implications as related to the previous literature in this area of education.

Summary

To study the effects of physical education and visual-perceptual training on reading skill level of first-grade children, the population for this study consisted of 48 students from the two first-grade classes at Buffalo Grade School. Because post-test reading skill levels were influenced by pre-reading levels, the subjects were pre-tested for reading skill, blocked into groups of four, and randomly assigned one of the following treatments: P_1V_1 (traditional physical education only), P_1V_2 (traditional physical education supplemented with visual-perceptual

training, P_2V_1 (perceptual-motor physical education only), or P_2V_2 (perceptual-motor physical education supplemented with visual-perceptual training).

In order to test the hypothesis of interest in this study, it was necessary to determine methods of measurement for reading skill and perceptual-motor skill of the population. It was decided that an easily administered and scored reading skill survey test for first-graders would be used to determine pre- and post-reading skill levels. The Metropolitan Reading Survey (35) was chosen. A comprehensive, practical perceptual-motor battery was compiled from a survey of the literature in that area of interest. This seven subtest perceptual-motor battery was also administered prior to and following treatments.

Based upon the randomized block design of this study, the results of the reading skills post-tests were analyzed by a two-way ANOVA. The results of the ANOVA indicated that although there was a 10 percent improvement in reading skill scores, the effects of the four different treatments were not significantly different. Secondarily, through six simple linear correlations, various perceptual-motor skills were compared to reading skills, indicating correlations ranging from fairly high (r=.78) to slight (r=.185). This would seem to indicate that the perceptual-motor experience and ability of the testing population was specific and was not interdependent upon their reading skill ability.

Discussion

In researching the possible effects of perceptual-motor physical education and visual-perceptual training on reading skill level of first-grade children, it was found that none of the four treatment programs had any significantly different effects on reading skill levels of the testing population. These findings were compatible with other similar studies (24,32,36). O'Connor (32,p.708) stated, "...change in gross motor activities does not necessarily effect change in perceptual or academic ability of the average first-grader." Keim (25) reported that visual-motor training did not result in any significant gains in readiness for learning or measured intelligence.

This study indicated that perceptual-motor ability and reading ability are not as interdependent as some studies have proposed (27,28,42). As was pointed out in the review of literature, Trussell (47,p.389) said, "...although perceptual, motor, and reading functions develop in a somewhat parallel manner, each of the variables has considerable specificity unto itself." The hypothesis that perceptual-motor training will improve reading skill level was not substantial in this study. It did, however, support the theory that perceptual-motor skills are specific and do not have high correlation with reading skill.

The data obtained from the testing indicated a 10 percent overall improvement between pre- and post-reading

test scores. One would be inclined to conclude that improvement in reading skill level from pre- to post-test was due to expected gains in reading ability for first-grade students as a result of the regular classroom instruction and reading activities provided there. Nevertheless, the hypothesis that perceptual-motor training will improve reading skill level was not true in this study.

The results of the correlational analysis of perceptual-motor skill to reading skill did not indicate high overall correlations between those parameters. The one area of fairly high correlation in this study was found when comparing the Shape-O-Ball test with reading skill level. This finding was in agreement with Chissom, et al., (10,p.1097), "...the Shape-O-Ball Test made the most significant contribution from the motor domain..." It is interesting that there was only an average one percent gain in the five subtests taken from the Purdue test, and a five percent gain in the target throwing test. These findings were in agreement with other research in the area (21,42). Shaw (42) concluded in her six month study on the effects of perceptual-motor physical education on reading achievement in first-grade students that there was no evidence that perceptual-motor skills were improved more than with the activity of a traditional physical education program. The findings of this study, although not in agreement with all similar studies (24,27), may indicate that the children already had an adequate perceptual-motor background with

which to accomplish the tasks required of them.

Conclusions

From the data collected in this study, one could conclude that the perceptual-motor programming in this study, taken from Cratty (13) and Kephart (26), did not differ significantly in it's effects upon reading skill level of first-graders as compared to a traditional physical education program. It could also be concluded that a program of extra visual-perceptual training also had no significant effect upon reading skill level in first-grade. With respect to perceptual-motor skill level, it was found that no significant correlations existed for this testing population.

From these conclusions it is possible to make some recommendations concerning physical education programming for the purpose of enhancing academic and motor skills. Although the findings of this study did not support the theory that specific perceptually oriented activities enhance reading skills, there was no indication that they hindered the advancement of reading skill in first-grade children. The researcher believes that both traditional physical education and perceptually oriented physical education have important roles in the early elementary school curriculum. By providing young children with as many different movement experiences as possible, one provides

for optimum development of that childs motor ability and movement patterns which he will later draw on, as movements become more integrated and complex. Through observation of the children during administration of the treatment programs, it was apparent that both programs of physical education were enjoyable to the children, and both could easily be incorporated into an overall curriculum of elementary physical education. The total research in the area of motor and cognitive development is still inconclusive. Many possibilities for research still exist. It is important that educators maintain an open mind and willingness to try new ideas and concepts as they relate to the improvement of educational opportunities for the students. It is hoped that this study has provided some insight and added interest to our continuing search for programs and concepts that will enhance the experience of the children.

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APPENDIXES

APPENDIX A

Perceptual-Motor Battery Score Sheet

PERCEPTUAL-MOTOR BATTERY SCORE SHEET

Name: _____ Age: _____ Date: _____

TEST I: WALKING BOARD

Forward

		Comments
steps off board	_____	
pauses frequently	_____	
uses one side of body more consistently	_____	
avoids balance-runs	_____	
long steps	_____	
feet crosswise on board	_____	
maintains inflexible posture	_____	Score:

Backward

steps off board	_____	
pauses frequently	_____	
uses one side of body more consistently	_____	
avoids balance-runs	_____	
long steps	_____	
feet crosswise on board	_____	
maintains inflexible posture	_____	
must look at feet	_____	
twists to see	_____	Score:

Sideward

unable to shift weight	_____	
confusion or hesitation in shifting weight	_____	
crosses one foot in front of other	_____	
steps off board	_____	
performs more easily in one direction than the other		
right:	_____	
left:	_____	Score:

TEST II: IMITATION OF MOVEMENTS

		Comments
does not mirror the patterns	_____	
not consistent...sometimes mirrored sometimes parallel	_____	
shows hesitation or lack of certainty	_____	
makes abortive movements	_____	
moves wrong limb	_____	
does not recognize errors spontaneously	_____	
recognizes errors after delay	_____	Score:

TEST III: ANGELS-IN-THE-SNOW

must look from one limb to the other to identify	_____	
cannot identify by visual data	_____	
requires tactual information to identify limbs	_____	
taps or moves limbs on floor to identify	_____	
abortive movements to get started	_____	
hesitation at movement beginning	_____	
movements hesitant and jerky	_____	
overflow into other limbs	_____	
movements do not reach maximum extension	_____	
requests repetitions of instructions	_____	
cannot correct response in one try	_____	Score:

TEST IV: CHALKBOARD CIRCLE

Comments

does not reach proper size _____
direction incorrect for hand _____
draws not directly in front _____
does not cross mid-line _____
shape of circle not accurate _____
must stop to "think out" next movement _____
wrist is stiff and difficult to control _____
still shows difficulty after three to four attempts _____

Score:

DOUBLE CIRCLE

does not reach proper size _____
first attempts are small and far apart _____
circles overlap _____
one circle larger than other _____
one more accurate than other _____
circles drawn on top of one another _____
direction incorrect _____
hands parallel _____
opposite but wrong direction _____
circles flat toward inside _____
inaccuracies not parallel to both circles _____
visual attention to one hand _____
movements of two arms not synchronized _____

Score:

Lateral Lines

"walks across" the board _____
draws left half with left hand right half with right hand _____
pivots to avoid crossing midline _____
difficulty when one hand is on opposite side of midline _____
false starts _____
pauses and confusion _____
inaccuracies _____

Score:

Vertical Lines		Comments
lines bow:		
slightly	____	
markedly	____	
visual attention to one hand	____	
one hand ceases to function	____	
hands move alternately	____	Score:

TEST V: FORM PERCEPTION (form)

changes orientation of paper to alter direction of movement	____	
segments drawings	____	
internal lines of divided rectangle segmented	____	
"ears" on forms	____	
drawings markedly larger or smaller	____	Score:

(organization)

no discernible organization	___	
organization is:		
left to right	____	
vertical	____	
circular	____	Score:

TEST VI: SHAPE-O-BALL

trial 1: _____ trial 2: _____ Average: _____

TEST VII: TARGET THROWING

Points: _____

APPENDIX B

Reading Skill Pre-Test Scores

TABLE V

READING SKILL PRE-TEST SCORES
OF FIRST-GRADE STUDENTS
BUFFALO GRADE SCHOOL
APRIL, 1981

	NAME	SEX	AGE	AUDITORY			VISUAL			LANGUAGE			COMPOSITE		QUANTITATIVE		
				T_1	T_2	TOT	T_1	T_2	TOT	T_1	T_2	TOT	RAW	PER.	T_1	T_2	TOT
1	EH	G	6.4	13	16	29	8	16	24	9	7	16	69	96	6	14	20
2	KC	G	7.1	11	15	26	10	15	25	8	9	17	68	94	7	14	21
3	WL	G	7.1	12	16	28	8	14	22	9	9	18	68	94	8	14	22
4	BM	B	7.3	13	16	29	7	15	22	9	8	17	68	94	6	13	19
5	SB	G	7.5	11	16	27	8	15	23	9	8	17	67	91	8	14	22
6	KO	G	7.3	13	15	28	10	16	26	7	6	13	67	91	6	12	18
7	RB	G	7.4	13	16	29	8	14	22	8	7	15	66	88	8	13	21
8	LB	G	6.9	13	16	29	8	15	23	8	6	14	66	88	6	12	18
9	CC	G	7.3	13	16	29	6	14	20	8	9	17	66	88	5	12	17
10	SG	G	6.11	10	15	25	9	15	24	8	8	16	65	85	7	15	22
11	MC	G	6.11	13	14	27	7	15	22	9	7	16	65	85	6	13	19
12	HS	B	7.1	13	11	24	8	15	23	9	9	18	65	85	5	14	19
13	KN	G	7.4	13	16	29	8	15	23	6	7	13	65	85	5	13	18
14	JO	B	6.11	10	16	26	8	15	23	7	8	15	64	82	7	12	19
15	MC	B	7.1	13	16	29	8	13	21	7	6	13	63	79	5	15	20

TABLE V (continued)

NAME	SEX	AGE	AUDITORY			VISUAL			LANGUAGE			COMPOSITE		QUANTITATIVE		
			T_1	T_2	TOT	T_1	T_2	TOT	T_1	T_2	TOT	RAW	PER.	T_1	T_2	TOT
16 CW	G	6.11	11	15	26	10	10	20	9	7	16	62	76	7	14	21
17 KV	B	7.4	10	16	26	6	15	21	7	8	15	62	76	6	12	18
18 AB	G	7.1	12	16	28	7	14	21	8	5	13	62	76	4	14	18
19 RR	B	6.11	12	15	27	9	14	23	5	7	12	62	76	6	13	19
20 EH	G	7.4	9	16	25	7	15	22	7	7	14	61	73	7	13	20
21 CC	G	7.2	13	15	28	6	14	20	7	6	13	61	73	6	10	16
22 KD	G	6.11	13	13	26	8	15	23	6	6	12	61	73	6	13	19
23 RK	G	6.6	9	16	25	8	16	24	7	5	12	61	73	6	11	17
24 VG	G	7.2	11	14	25	8	14	22	6	6	12	59	67	6	9	15
25 KG	G	6.11	13	16	29	5	12	17	8	5	13	59	67	5	9	14
26 JP	B	7.5	12	13	25	7	11	18	7	8	15	58	64	6	10	16
27 TH	G	6.8	6	16	22	7	15	22	7	6	13	57	61	2	8	10
28 AM	G	6.5	9	15	24	7	13	20	7	6	13	57	61	3	8	11
29 HJ	B	6.10	8	9	17	8	16	24	8	7	15	56	59	7	11	18
30 BK	B	7.2	11	16	27	8	14	22	3	4	7	56	59	2	9	11
31 RJ	B	6.9	10	13	23	7	9	16	8	5	13	52	51	5	10	15
32 JS	G	7.3	10	11	21	4	15	19	7	4	11	51	48	5	9	14
33 JB	B	6.9	7	8	15	9	14	23	7	5	12	50	46	5	8	13

TABLE V (continued)

NAME	SEX	AGE	AUDITORY			VISUAL			LANGUAGE			COMPOSITE		QUANTITATIVE		
			T_1	T_2	TOT	T_1	T_2	TOT	T_1	T_2	TOT	RAW	PER.	T_1	T_2	TOT
34 VF	G	6.9	9	7	16	8	16	24	6	3	9	49	44	1	9	10
35 DB	G	6.8	5	10	15	7	11	18	6	8	14	47	40	6	10	16
36 MO	B	6.11	8	12	20	5	13	18	5	4	9	47	40	5	10	15
37 BC	B	6.7	8	13	21	5	11	16	3	6	9	46	38	4	10	14
38 FC	B	7.1	5	11	16	6	13	19	6	5	11	46	38	2	8	10
39 ST	G	7.2	8	8	16	4	12	16	6	7	13	45	36	4	6	10
40 SS	G	7.4	9	11	20	6	10	16	3	4	7	43	32	3	12	15
41 MH	G	7.1	6	12	18	5	10	15	5	4	9	42	30	4	10	14
42 RB	G	6.8	4	5	9	6	13	19	8	4	12	40	27	4	5	9
43 MS	G	6.10	9	7	16	5	7	12	4	3	7	35	19	1	9	10
44 ED	B	7.1	4	4	8	6	11	17	5	4	9	34	18	4	5	9
45 JH	G	6.8	5	7	12	2	5	7	7	4	11	30	12	1	4	5
46 TJ	B	7.9	1	7	8	5	8	13	5	2	7	28	10	3	7	10
47 KA	G	6.8	1	5	6	4	4	8	3	5	8	24	5	4	8	12
48 TF	G	7.3	4	5	9	2	3	5	3	1	4	18	2	0	2	2

APPENDIX C

Reading Skill Post-Test Scores

TABLE VI

READING SKILL POST-TEST SCORES
OF FIRST-GRADE STUDENTS
BUFFALO GRADE SCHOOL
JUNE, 1981

NAME	SEX	AGE	AUDITORY			VISUAL			LANGUAGE			COMPOSITE		QUANTITATIVE		
			T_1	T_2	TOT	T_1	T_2	TOT	T_1	T_2	TOT	RAW	PER	T_1	T_2	TOT
1 EH	G	6.6	13	16	29	10	16	26	8	8	16	71	99	7	15	22
2 KC	G	7.3	13	16	29	10	16	26	8	9	17	72	99+	8	15	23
3 WL	G	7.3	13	16	29	9	16	25	9	9	18	72	99+	7	12	19
4 BM	B	7.5	13	16	29	10	16	26	9	9	18	73	99+	8	13	21
5 SB	G	7.7	12	16	28	8	16	24	9	9	18	70	98	6	14	20
6 KO	G	7.5	13	16	29	10	16	26	9	8	17	72	99+	8	15	23
7 RB	G	7.6	13	16	29	9	15	24	9	9	18	71	99	8	14	22
8 LB	G	6.11	12	16	28	9	16	25	9	9	18	71	99	8	14	22
9 CC	G	7.5	12	16	28	8	16	24	8	9	17	69	96	7	15	22
10 SG	G	7.1	11	16	27	9	16	25	9	8	17	69	96	7	14	21
11 MC	G	7.1	12	15	27	7	15	22	8	7	15	64	82	6	12	18
12 HS	B	7.3	10	14	24	9	16	25	9	9	18	67	91	6	8	14
13 KN	G	7.6	13	16	29	5	15	20	8	9	17	66	88	4	14	18
14 JO	B	7.1	12	15	27	9	15	24	9	8	17	68	94	6	14	20
15 MC	B	7.3	13	16	29	9	16	25	9	6	15	69	96	6	14	20

TABLE VI (continued)

NAME	SEX	AGE	AUDITORY			VISUAL			LANGUAGE			COMPOSITE		QUANTITATIVE		
			T_1	T_2	TOT	T_1	T_2	TOT	T_1	T_2	TOT	RAW	PER.	T_1	T_2	TOT
16 CW	G	7.1	12	16	28	10	16	26	8	9	17	71	99	9	14	23
17 KB	B	7.6	13	16	29	8	16	24	9	8	17	70	98	7	15	22
18 AB	G	7.3	12	16	28	9	15	24	7	9	16	68	94	6	13	19
19 RR	B	7.1	10	15	25	9	16	25	8	7	15	65	85	8	13	21
20 EH	G	7.6	11	16	27	10	16	26	9	9	18	71	99	7	14	21
21 CC	G	7.4	12	16	28	6	13	19	7	5	12	59	67	7	11	18
22 KD	G	7.1	12	16	28	9	16	25	6	7	13	66	88	8	15	22
23 RK	G	6.8	12	16	28	9	16	25	6	7	13	66	88	7	12	19
24 VG	G	7.4	13	16	29	8	14	22	6	8	14	65	85	5	13	18
25 KG	G	7.1	13	16	29	10	15	25	9	8	17	71	99	5	13	18
26 JP	B	7.7	10	16	26	8	13	21	7	6	13	60	70	5	10	15
27 TH	G	6.10	3	15	18	7	12	19	8	4	12	49	44	3	8	11
28 AM	G	6.7	11	15	26	8	10	18	8	9	17	61	73	8	10	18
29 HJ	B	7.0	10	16	26	9	15	24	8	9	17	67	91	9	11	20
30 BK	B	7.4	13	16	29	9	14	23	7	4	11	63	79	5	11	16
31 RJ	B	6.11	10	15	25	10	10	20	8	6	14	59	67	6	13	19
32 JS	G	7.5	10	16	26	7	16	23	6	6	12	61	73	7	10	17
33 JB	B	6.11	10	12	22	10	15	25	8	8	16	63	79	3	10	13

TABLE VI (continued)

NAME	SEX	AGE	AUDITORY			VISUAL			LANGUAGE			COMPOSITE		QUANTITATIVE		
			T_1	T_2	TOT	T_1	T_2	TOT	T_1	T_2	TOT	RAW	PER.	T_1	T_2	TOT
34 VF	G	6.11	8	9	17	9	15	24	6	6	12	53	53	4	13	17
35 DB	G	6.10	8	9	17	7	14	21	6	7	13	51	48	3	13	16
36 MO	B	7.1	11	15	26	7	15	22	8	8	16	64	82	4	13	17
37 BC	B	6.9	10	13	23	7	14	21	8	6	14	58	64	5	11	16
38 FC	B	7.3	8	11	19	7	16	23	9	7	16	58	64	1	9	10
39 ST	G	7.4	12	11	23	7	14	21	8	9	17	61	73	4	13	17
40 SS	G	7.6	13	12	25	10	16	26	8	5	13	64	82	7	14	21
41 MH	G	7.3	11	14	25	6	12	18	5	8	13	56	59	3	10	13
42 RB	G	6.10	4	8	12	8	11	19	7	8	15	46	38	3	4	7
43 MS	G	7.0	11	11	22	8	16	24	7	2	9	55	57	4	8	12
44 ED	B	7.3	6	8	14	9	16	25	9	6	15	54	55	5	8	13
45 JH	G	6.10	4	11	15	7	9	16	4	3	7	38	24	3	8	11
46 TJ	B	7.11	7	3	10	5	4	9	3	4	7	26	7	4	4	8
47 KA	G	6.10	7	8	15	5	6	11	6	5	11	37	23	1	8	9
48 TF	G	7.5	8	14	22	6	5	11	7	4	11	44	34	3	4	7

APPENDIX D

Perceptual-Motor Pre-Test Scores

TABLE VII

PERCEPTUAL-MOTOR PRE-TEST SCORES
TREATMENT GROUP P_1V_1

NAME/ SEX	WALKING FOR	WALKING BACK	BD. SIDE	IMIT MOVE	ANGELS-IN-SNOW	CHALKBOARD CIR	CHALKBOARD DC	CHALKBOARD LAT	TEST VER	FORM PER FOR	FORM PER ORG	TOT	TAR	SHAPE-O-BALL
WL (G)	4	4	4	3	3	3	3	4	4	2	3	37	6	0:49.56
LB (G)	4	3	3	3	3	2	2	3	2	3	4	32	1	1:21.37
CC (G)	4	3	3	3	3	4	3	4	4	3	2	36	2	1:41.79
CW (G)	4	4	4	3	3	3	2	1	3	3	4	34	3	1:03.51
EH (G)	4	3	3	3	3	4	2	2	4	2	4	34	8	1:01.87
RK (G)	3	3	4	3	2	3	1	3	3	2	3	30	2	1:00.24
KG (G)	4	3	4	3	3	4	2	2	4	2	4	35	4	1:02.85
BK (B)	4	3	3	2	2	2	2	1	2	1	2	24	5	1:45.90
FC (B)	4	2	4	3	1	3	2	1	3	2	2	27	12	1:02.51
JB (B)	4	3	4	3	3	4	2	4	3	2	3	35	5	1:29.89
MS (G)	4	2	3	3	2	1	1	1	1	2	1	21	1	2:21.92
TF (G)	2	1	3	2	1	2	2	4	2	1	1	21	0	4:09.32
TOTALS	45	34	42	34	29	35	24	30	35	25	33	366	49	
AVE.	3.8	2.8	3.5	2.8	2.4	2.9	2.0	2.5	2.9	2.1	2.8	30.5	4.1	1:34.23

TABLE VIII

PERCEPTUAL-MOTOR PRE-TEST SCORES
TREATMENT GROUP P_1V_2

NAME/ SEX	WALKING FOR	WALKING BACK	BD. SIDE	IMIT MOVE	ANGELS-IN-SNOW	CHALKBOARD CIR	CHALKBOARD DC	CHALKBOARD LAT	CHALKBOARD VER	TEST FORM FOR	TEST FORM ORG	PER TOT	PER TAR	SHAPE-O-BALL
EH (G)	4	3	4	2	2	4	2	2	2	3	4	32	4	0:59.60
SB (G)	4	4	4	3	2	1	2	4	4	2	3	33	2	2:32.86
HS (B)	4	2	4	3	3	3	1	2	4	2	1	29	9	0:57.00
JO (B)	4	2	3	3	2	4	1	3	2	2	3	29	3	1:30.29
KB (B)	3	3	4	3	2	4	2	2	4	3	2	32	6	0:50.75
CC (G)	4	3	3	3	2	4	2	3	2	1	1	28	9	1:41.49
TH (G)	4	3	4	3	4	4	2	3	4	2	3	36	8	2:53.75
RJ (B)	4	3	3	3	3	4	1	1	2	2	4	30	3	1:00.99
VF (G)	4	3	3	3	2	4	3	3	2	2	4	33	3	1:45.15
ST (G)	4	3	2	3	2	2	1	4	2	3	2	28	7	0:51.34
ED (B)	3	3	4	2	2	3	1	1	1	2	4	26	10	1:38.09
JH (G)	4	2	3	2	2	1	1	1	1	2	1	20	1	1:33.32
TOTALS	46	34	41	33	28	38	19	29	30	26	32	356	65	
AVE.	3.8	2.8	3.4	2.8	2.3	3.2	1.6	2.4	2.5	2.2	2.7	29.7	5.4	1:31.22

TABLE IX

PERCEPTUAL-MOTOR PRE-TEST SCORES
TREATMENT GROUP P_2V_1

NAME/ SEX	WALKING BD. FOR	BACK	SIDE	IMIT MOVE	ANGELS-IN-SNOW	CHALKBOARD CIR	DC	LAT	VER	FORM PER FOR	ORG	TOT	TAR	SHAPE-O-BALL
BM (B)	4	4	3	3	3	2	3	3	4	3	2	34	16	1:24.00
KO (G)	4	4	4	3	3	4	4	4	4	3	1	38	3	0:59.81
MC (G)	3	3	4	2	2	4	4	3	3	3	4	35	5	1:20.32
KN (G)	4	3	3	2	2	3	4	4	2	3	2	32	1	2:01.50
RR (B)	3	3	3	3	2	3	1	4	3	2	2	29	2	1:36.00
VG (G)	4	3	4	3	3	4	3	4	4	2	4	38	1	1:23.63
AM (G)	4	4	4	3	3	4	3	4	4	3	2	38	0	1:21.11
HJ (B)	3	3	4	3	2	2	2	4	4	2	2	31	5	1:07.62
DB (G)	4	3	3	2	1	1	1	1	4	2	4	26	5	1:05.69
BC (B)	4	3	4	2	2	2	2	2	2	1	1	25	10	3:35.61
RB (G)	2	2	3	2	2	3	2	3	3	1	1	24	1	2:21.64
TJ (B)	4	4	4	2	1	3	1	3	2	1	2	27	11	3:47.56
TOTALS	43	39	43	30	26	35	30	39	39	26	27	377	60	
AVE.	3.6	3.3	3.6	2.5	2.2	2.9	2.5	3.3	3.3	2.2	2.3	31.4	5	1:50.37

TABLE X

PERCEPTUAL-MOTOR PRE-TEST SCORES
TREATMENT GROUP P_2V_2

NAME/ SEX	WALKING FOR	WALKING BACK	BD. SIDE	IMIT MOVE	ANGELS-IN-SNOW	CHALKBOARD CIR	CHALKBOARD DC	CHALKBOARD LAT	CHALKBOARD VER	TEST FORM FOR	TEST FORM ORG	PER TOT	PER TAR	SHAPE-O-BALL
KC (G)	4	3	4	3	2	4	2	4	4	2	2	34	3	1:34.12
RB (G)	4	3	4	3	3	3	2	4	3	3	3	35	5	1:03.10
SG (G)	4	3	4	3	2	4	4	4	4	3	3	38	6	0:58.33
MC (B)	4	2	2	3	3	3	3	4	2	3	3	32	3	0:53.20
AB (G)	3	3	4	3	4	2	2	1	2	3	3	30	3	1:31.96
KD (G)	4	3	4	2	2	4	1	3	4	2	4	33	2	1:07.55
JP (B)	4	3	3	2	3	1	1	3	1	1	2	24	10	1:15.00
JS (G)	4	3	3	3	2	1	1	2	1	1	1	22	4	2:46.54
MO (B)	4	3	4	3	4	3	1	3	3	2	4	34	8	1:21.29
SS (G)	4	3	4	3	3	3	2	2	1	3	4	32	2	1:02.72
MH (G)	4	3	3	3	2	3	1	2	3	1	4	29	8	2:06.47
KA (G)	3	3	3	3	3	2	1	4	3	1	1	27	2	1:28.51
TOTALS	46	35	42	34	33	33	21	36	31	25	34	370	56	
AVE.	3.8	2.9	3.5	2.8	2.8	2.8	1.8	3	2.6	2.1	2.8	30.8	4.7	1:25.73

APPENDIX E

Perceptual-Motor Post-Test Scores

TABLE XI

PERCEPTUAL-MOTOR POST-TEST SCORES
TREATMENT GROUP P_1V_1

NAME/ SEX	WALKING BD. FOR		BACK	SIDE	IMIT MOVE	ANGELS-IN-SNOW	CHALKBOARD CIR	DC	LAT	VER	PERFORM FOR	ORG	TOT	TAR	SHAPE-O-BALL
WL (G)	4	4	3		3	2	4	2	3	4	2	3	34	2	0:53.09
LB (G)	4	4	4		3	3	2	2	4	4	3	4	37	10	1:00.20
CC (G)	4	3	4		3	3	3	3	1	4	3	3	34	6	0:56.02
CW (G)	4	3	4		3	4	4	3	4	4	3	2	38	2	0:51.72
EH (G)	4	3	3		3	4	4	3	3	2	2	4	35	9	0:46.62
RK (G)	4	3	4		3	2	4	4	4	2	2	3	35	2	1:19.82
KG (G)	4	3	3		3	3	3	3	3	4	2	4	35	5	1:30.46
BK (B)	4	3	4		3	2	2	1	3	2	1	2	27	8	1:06.07
JB (B)	4	3	4		2	2	2	2	4	2	2	3	30	10	1:47.12
FC (B)	4	1	4		3	2	3	2	2	3	2	3	29	16	1:04.51
MS (G)	3	2	3		3	4	3	1	3	2	2	1	27	4	2:15.91
TF (G)	2	2	2		2	1	2	2	3	2	1	2	21	0	3:30.24
TOTALS	45	34	42		34	32	36	28	37	35	25	34	382	74	
AVE.	3.8	2.8	3.5		2.8	2.7	3	2.3	3.1	2.9	2.1	2.8	31.8	6.2	1:25.15

TABLE XII

PERCEPTUAL-MOTOR POST-TEST SCORES
TREATMENT GROUP P_1V_2

NAME/ SEX	WALKING BD. FOR		BACK SIDE	IMIT MOVE	ANGELS-IN-SNOW	CHALKBOARD CIR	DC	LAT	VER	PER FORM FOR	ORG	TOT	TAR	SHAPE-O-BALL
EH (G)	4	3	4	3	3	3	2	3	2	4	4	35	5	1:02.09
SB (G)	4	4	4	3	2	1	1	2	2	2	2	28	1	0:59.85
HS (B)	4	3	4	3	3	4	2	3	4	2	1	33	13	1:09.81
JO (B)	4	3	2	3	2	4	1	2	1	2	4	28	9	1:17.17
KB (B)	4	3	3	3	2	4	3	4	2	2	2	32	6	0:57.43
CC (G)	4	3	4	3	3	3	3	4	3	2	2	34	10	1:44.76
TH (G)	4	3	3	3	2	4	1	3	3	2	3	31	9	2:56.13
RJ (B)	4	3	4	3	3	4	1	1	2	2	4	31	4	1:23.35
VF (G)	3	3	2	3	3	4	1	2	1	2	4	28	2	1:09.92
ST (G)	4	4	3	3	3	4	1	4	3	2	3	34	9	1:07.60
ED (B)	4	3	3	2	2	2	1	1	2	2	2	24	6	1:19.54
JH (G)	4	3	3	2	2	4	3	4	2	2	2	31	3	1:45.50
TOTALS	47	38	39	34	30	41	20	34	27	26	33	369	77	
AVE.	3.9	3.2	3.3	2.8	2.5	3.4	1.7	2.8	2.3	2.2	2.8	30.8	6.4	1:24.43

TABLE XIII

PERCEPTUAL-MOTOR POST-TEST SCORES
TREATMENT GROUP P_2V_1

NAME/ SEX	WALKING BD. FOR	BACK	SIDE	IMIT MOVE	ANGELS-IN-SNOW	CHALKBOARD CIR	DC	LAT	TEST VER	FORM PER FOR	ORG	TOT	TAR	SHAPE-O-BALL
BM (B)	4	3	3	3	3	3	2	4	4	3	2	34	12	1:01.43
KO (G)	4	3	4	3	4	4	4	4	3	3	4	40	12	0:48.41
MC (G)	3	3	3	2	3	4	4	3	3	3	4	35	3	1:21.84
KN (G)	4	3	4	3	3	3	4	3	3	3	3	36	2	1:07.10
RR (B)	3	3	4	3	2	2	2	4	2	3	4	32	4	1:04.34
VG (G)	4	3	3	3	4	4	3	3	3	2	4	36	9	0:59.79
AM (G)	3	3	3	3	2	1	1	1	1	2	2	22	2	1:31.80
HJ (B)	4	3	3	2	2	3	2	4	2	2	4	31	9	1:07.31
DB (G)	4	3	3	3	1	1	1	2	2	2	4	26	9	1:09.02
BC (B)	4	2	3	3	3	2	2	2	1	1	2	25	2	1:46.09
RB (G)	3	1	2	2	2	3	2	1	2	1	2	21	2	1:16.50
TJ (B)	4	3	3	3	2	3	2	4	2	2	4	32	10	2:06.48
TOTALS	44	33	38	33	31	33	29	35	28	27	39	370	76	
AVE.	3.7	2.8	3.2	2.8	2.6	2.8	2.4	2.9	2.3	2.3	3.3	30.8	6.3	1:16.09

TABLE XIV

PERCEPTUAL-MOTOR POST-TEST SCORES
TREATMENT GROUP P_2V_2

NAME/ SEX	WALKING FOR	WALKING BACK	BD. SIDE	IMIT MOVE	ANGELS-IN-SNOW	CHALKBOARD CIR	CHALKBOARD DC	CHALKBOARD LAT	CHALKBOARD VER	PER FORM FOR	PER FORM ORG	TOT	TAR	SHAPE-O-BALL
KC (G)	4	4	4	3	3	4	4	1	3	2	3	35	8	0:54.28
RB (G)	4	3	3	3	3	3	2	4	3	3	4	35	7	0:29.36
SG (G)	3	3	3	3	2	3	1	2	3	3	4	30	10	1:33.35
MC (B)	4	3	4	3	2	4	3	2	4	2	2	33	6	0:51.36
AB (G)	4	3	3	3	3	3	3	3	2	3	3	33	4	1:15.50
KD (G)	4	3	4	3	2	4	2	4	2	3	2	33	3	1:20.22
JP (B)	4	2	3	3	2	1	1	4	2	1	2	25	15	1:21.80
JS (G)	3	3	3	3	2	3	2	3	2	1	2	27	3	1:01.86
MO (B)	4	3	4	3	3	4	1	1	2	2	3	30	10	1:09.72
SS (G)	4	3	3	3	3	3	2	4	3	2	3	33	8	1:18.73
MH (G)	4	2	3	3	2	2	2	4	3	2	4	31	1	1:34.34
KA (G)	3	2	3	2	3	3	3	3	2	2	1	27	2	2:13.87
TOTALS	45	34	40	35	30	37	26	35	31	26	33	372	77	
AVE.	3.8	2.8	3.3	2.9	2.5	3.1	2.2	2.9	2.6	2.2	2.8	31.0	6.4	1:15.37

APPENDIX F

Letter to Obtain Parental Permission

March, 1981

Dear Parents,

As a part of my Masters Degree program at Marshall University, I will be doing a thesis study involving the first-grade students at Buffalo Grade School. The study will involve working with two basic types of physical education programs for young children - one which stresses games and rhythmical activities, and one which stresses perceptual-motor development through various activities. As an evaluation tool, I will be doing some testing of reading skills to determine if either of the physical education programs enhances academic skills (reading, in this case). To evaluate reading skill level I will be using the Metropolitan Reading Skills Test for first-grade children. The tests have been ordered and approved by the county testing director and the school principal.

Since the Metropolitan Test is not included in the regular county-wide testing program, I have been advised to obtain parental permission before administering the test to your child. I also need permission for your child to be included in the study. All of the results will be confidential. However, if you would like to know how your child scores, I will be happy to share that information with you. Thanks for your help. Please return the permission below as quickly as possible.

Thanks again,

Mindy Allen-physical education instructor

To Whom It May Concern:
I give my permission to have (child's name) _____ tested and included in this thesis study, realizing that all results will be confidential. If I have any questions I will feel free to talk to Mrs. Allen.

_____