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A STUDY OF THE RELATIONSHIP BETWEEN CHILDREN'S READING
ABILITY AND THEIR PHYSICAL MOTOR COMPETENCIES

A Thesis

Presented to

the Graduate Faculty

Central Washington State College

In Partial Fulfillment
of the Requirements for the Degree
Master of Education

by

Larry F. Hinchey

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CHAPTER I

INTRODUCTION

Throughout the past decade there has been an education trend toward developing the child's whole personality. Since the child's personality is integrated rather than an accumulation of parts, the school must accept some responsibility for developing that personality beyond its cognitive aspect. In other words, the school must aid in developing the individual intellectually, physically, emotionally, and socially. Educators still acknowledge that intellectual development is the primary purpose of education, but in recent years have recognized also the physical, emotional, and social development of the individual and the effects such may have on learning.

It has been found that the child considered adequately adjusted physically, emotionally, and socially usually has less difficulty learning than does a maladjusted student of equal mental potential. Conversely, it is apparent that the non-learner usually is maladjusted emotionally and socially or both. As a result, it is becoming evident that along with intellectual development a balance of physical, emotional, and social development is necessary for successful learning.

It is probably true that some areas of education offer more opportunities to build physical, emotional, and social traits than others. Physical educators strongly believe that physical education presents one of the best environments for aiding the development of these traits.

This study was an attempt to test the possibility of strengthening these personality traits in the non-learner through physical education. Strengthening these traits may have an indirect affect upon the student's achievement in other areas of learning.

In order to determine if physical education might have an effect upon learning, it was necessary to select an academic subject considered essential to learning and one affected by emotional and social adjustment. For these reasons and the research done in this area, learning to read was selected.

Research indicates that the most serious difficulties a child encounters in school lie in the area of reading. Helda Taba (34:18), an authority in the field of reading, defines reading goals as almost synonymous with objectives for all education and asserts that reading objectives, therefore, should be viewed as an integral part of the total learning experience. Also, many studies indicate a high relation between reading ability and scholastic success. When a child fails in school, reading

retardation is almost always in some way related to that failure.

Many children have the capacity to learn to read but fail to do so. Often this is not due to physical factors such as absenteeism, visual abnormalities, auditory handicaps, confused dominance, endocrine malfunction, or physical immaturity. Usually these are discovered and corrected through the school health program. Furthermore, it is not always the home environment; this, too, is often appraised and steps are taken to compensate for undesirable situations. However, in the absence of the physical and environmental factors mentioned, reading failure could very well be abetted by emotional or social immaturity.

Much time and research has been contributed to the affects of emotional and social development on the reading program. Moreover, the development of these areas has been emphasized in the physical education program. Physical educators believe that a good physical education program can best develop emotional and social traits.

V. T. Trusler defines physical education as

. . . a procedure used in education to bring about useful changes in human conduct to the end that a more wholesome and better integrated personality results. Thus though it may be said that it is developing the physical makeup of the individual, at the same time it is a means to educating the individual.

The major purposes of physical education then become identical with the purpose of all education.

It aims at the general outcome as do other departments in a given school system (36:1).

Nixon and Cozen state:

Fundamentally, physical education is concerned with individuals, situations, reactions and modifications. In the final analysis the only distinction between physical education and other forms of education lies in the fact that physical education is concerned largely with types of situations and responses characterized by muscular activity (24:5).

The preceding discussion was to introduce briefly some of the ways reading and physical education are related. Although their primary objectives differ, many of their general objectives are similar. Physical education attempts to build emotional and social qualities in the individual, and it has been pointed out that an absence of these same qualities can interfere with a child's learning to read.

A more extensive discussion of reading, physical education, and transfer of emotional and social traits will be continued in Chapter III, Review of Related Literature.

I. STATEMENT OF THE PROBLEM

This study, through controlled experimentation, will attempt to illustrate that physical education may have a favorable influence on reading achievement.

II. HYPOTHESES

1. Students who are given special motor training do not show significant increases in reading

achievement following training.

2. Students who are not given special motor training do not show significant increases in reading achievement over a nine week period.
3. Students who have been given special motor training are no different in reading achievement than students who have not received such training.

III. IMPORTANCE OF THE STUDY

Educators are constantly seeking new and improved methods to aid learning. At the present time much stress is given to certain subject areas and their worth to the total development of the child in the school and community.

Physical education has been criticized because many people fail to see that it has value in the school or community beyond mere physical development. Many people believe that physical development can be acquired outside of school through work and recreation and that it would be more profitable to spend time in school teaching more science, mathematics, and other academic subjects. Because of this, less importance is given physical education in comparison to other subjects. Physical educators have repeatedly pointed out other contributions of physical education, for instance character building or emotional

and social development, but because of lack of evidence or support for these contentions or because of misunderstanding of what these terms mean, people are unwilling to accept their views.

This study was an attempt to show that a good physical education program can contribute to the development of individuals in such a way as to favorably influence their reading achievement. If a relationship is found between psychomotor attainment and reading achievement, then progress would be made in understanding the worth of physical education. Certainly it would emphasize the need for more investigation in this area.

IV. LIMITATIONS OF THE STUDY

The outcomes of this study depend largely upon the acquisition of certain attitudes through physical education and the carry over of these attitudes to reading. Certain limitations are always present whenever human behavior is involved. First, assuming that a change in behavior or attitude did occur, the most critical limitation would be to determine if physical education or some other factor such as maturation caused the transition. It might be assumed in the light of a controlled experiment that physical education had an influence upon this transition, but there is no positive evidence. Secondly,

at the beginning of the study it would be difficult to determine the cause or causes of reading retardation, and these causes could negate any benefits which might result from an increase in motor ability.

Another limitation of the study might well be the time allotted for the experimental portion of the study. It takes time to build physical skill and related concomitant learnings and still more time for them to become part of the self.

CHAPTER II

PROCEDURES AND METHODS

In the following chapter the procedure used to select comparable group for the purposes of this study and the statistical methods utilized to compare and analyze data will be explained.

I. PROCEDURES

The procedures of this study involved controlled experimentation with a group of fourth grade boys. Approximately 250 boys living in similar districts were given three tests as the main criterion of selecting desirable subjects. First the Durrell-Sullivan reading achievement and reading capacity tests were given to all the boys. The purpose of the achievement test was to determine the retarded reader. The purpose of the capacity test was to indicate capacity or ability to learn to read. The subjects selected to take the third test were those who indicated a reading capacity comparable to or higher than their grade level but who were retarded one year or more in reading achievement. The third test given was the Iowa Revision of the Brace Motor Educability test, consisting of a series of stunts predicting a child's ability to learn physical motor skills. This test measures

motor ability, with primary emphasis on native rather than acquired abilities. The final selection of subjects for the study was made from those who scored average or above on the motor ability test.

After equating the subjects in each district according to reading ability and motor ability, each district contained 19 subjects. One district was designated the experimental group. For nine weeks, twenty minutes a day, this group was given special physical motor skills taught by the author. These included the basic skills as follows:

Running	Jumping
Starting	Hopping
Stopping	Climbing
Dodging	Rhythms

In addition, it included the following fundamental skills:

Throwing	Batting
Catching	Tumbling
Kicking	

The subjects in the other district were designated as the control group. The control group was to continue its normal routine and for that reason be a typical example of a normal group of children not receiving physical education.

At the end of the nine-week training period, both groups were retested in motor ability and three weeks later

in reading achievement. The Revised Iowa Brace Motor Educability and the Durrell-Sullivan Reading Achievement tests were given in the post-test as in the pre-test. Both the pre-tests and post-tests in reading were given by teachers under the direction of an educational psychologist. The motor skills tests were administered by the author.

II. METHODS

To analyze the data collected by the test given, three methods were used. First the Pearson (product moment) correlation coefficient was calculated between certain variables to determine the relationships in the pre-tests and the post-tests.

Secondly, in special instances to substantiate the findings of certain correlations, mean scores and mean differences were computed based on raw scores.

Thirdly, the control variables (reading achievement, reading capacity, and motor educability, pre-test) were tested for comparability by comparing the means using the random t-test. Also the criterion variable, reading achievement, was tested for significance.

In this situation the reading achievement, pre-test, control group was compared with reading achievement, experimental group, pre-test to determine the t-value at

the beginning, and the same tests were compared in the post-tests to determine if the motor training influenced the t-score, thus reading achievement.

CHAPTER III

REVIEW OF RELATED LITERATURE

This chapter will discuss the studies and opinions of several authorities concerning particular causes of reading deficiencies, development of character in physical education, and transference of learning from one situation to another. The intent is to stress the importance of emotional and social development in the reading program and point out the possibility of transferring emotional and social characteristics developed through physical education to the reading situation.

I. RELATED LITERATURE IN READING

It has been pointed out that reading retardation may be caused by one or a number of factors. Schubert (29:6) remarked that reading retardation could be caused by any of the following physical factors: poor health, consequent absenteeism, auditory handicaps, visual abnormalities, confused dominance, endocrine dysfunction, and physical immaturity. Psychological factors are mental, emotional, or social immaturity.

In support of the psychological causes, Robinson quotes from Dolch:

"Probably more deficiencies in reading can be traced to discouragement through failure and consequent

attitudes of antagonism toward reading, than any other cause. Many children hate the reading lesson simply because it compels them to exhibit before their companions their ignorance or lack of skill, except in cases in which a satisfactory compensation of a socially approved nature has been established" (28:80).

Realizing this unique problem, educators have devoted much time and effort to attempt to discover and correct the causes of reading failure. The physical causes, once discovered, usually can be corrected. The psychological causes are much harder to define and still more difficult to correct.

Sherman touched on some of the problems encountered when dealing with a retarded reader:

A child may react with a deep sense of failure not only because he realizes his inability to develop adequate reading efficiency, but also because he constantly has to face various social pressures. He must deal with the attitudes of his parents, who are greatly disappointed in his inability to learn, as well as those of his fellow pupils. He must deal too with the attitudes of the teacher, many of whom do not understand the difference between an inherent reading disability and an unwillingness to learn. The child with a reading disability must also deal with the reactions of his playmates, who certainly do not understand the complexity of a reading problem and who frequently tend to categorize the pupil with a reading disability as "dumb" or backward or peculiar. Thus it is not unnatural that frustration and its consequences play an important role in the case of children who have reading difficulties (30:130).

Investigators have found varying degrees of emotional disturbances in the retarded reader. N. B. Smith (31:8) related that failures, especially at a young age, affect the child's whole personality. Smith found 90 per cent of

200 cases of retarded readers to be emotionally disturbed. Misseldine's study (21:271) of 30 children with reading difficulties concluded that most retarded readers were "insecure, restless" and "emotionally ill." Ellis (10:60) concluded that there are emotional factors in many, if not all, cases of reading disability. Sylvester and Kunsts (33:69-70) reported that all pupils with reading problems have emotional problems. Other investigators not so conclusive in their conclusions were Robinson (28:203), who found that 42 per cent of a group of seriously retarded readers had emotional difficulties; Witty (37:291), who placed it at 52 per cent; and Chalman and Gates (31:8), who stated that 75 per cent had emotional difficulties.

Studies of the relationship between a child's emotional pattern and his reaction in learning have led investigators such as Sherman to say:

In many instances a given emotional pattern may be a distinct hindrance to learning a specific task or skill, whereas in others the emotionality of an individual may be a motivating force to greater effort. Then the emotions must be taken into account in evaluating success or failure (30:126).

.....

The emotionality of an individual at the time he is learning a task has a definite influence upon his efficiency in the learning situation. His emotional balance or imbalance also has a definite effect upon his retention of the material that he has learned and upon his ability to recall and put into use that which he may have learned well previously (30:129).

More specific personality characteristics observed in reading cases are fears, tension, a withdrawal of effort, lack of sustained attention, an antagonism toward school, compensatory interests, and a general lack of emotional and social responsiveness. Gann (11:373) studied superior, average, and retarded readers in grades three to six. She found indications that retarded readers were less stable than good readers, not as well adjusted emotionally, less adaptable socially, more fearful and less secure in the face of challenges, less efficient in the use of potential mental capacity, and more concerned with small details.

Gann states:

Implications from the findings in this study may be applied to the practical school situation where the Retarded Reader should be considered as a personality problem, as well as a learning problem. Consideration of his reading difficulty cannot be made apart from his personality adjustment and his attitudes toward the reading experience. Helping to build emotional security may be essential in stimulating greater participation and better achievements (11:139-40).

Robinson states:

There is no doubt that reading failure has led to frustration, discouragement, disinterest, inattention and maladjustment except in those cases in which a satisfactory compensation of a socially approved nature has been established (28:85).

Blanchard (6:774-76) found that a continuation of reading failure resulted in a feeling of failure and that, unless socially acceptable compensations were developed, personality and behavior problems were likely to develop.

If the child experienced success instead of failure, compensations were no longer needed. Children who fail repeatedly in their attempts to learn to read might accept failure and lose all confidence in themselves, rationalize the failure, or refuse to accept it. Such children seem to become aggressive, withdrawn, or lose emotional effectivity.

Witty and Kopel's (38:231) studies in 1939 of the differences between good and poor readers called attention to many of the same items as the previously mentioned studies. The poor reader participated in fewer activities than the good reader and showed higher frequency of fears. Approximately one-half of the children coming to the Northwestern University Psycho-Educational Clinic are characterized by fears and anxieties so serious and so far reaching that no program of re-education could possibly succeed which did not aim to re-establish self-confidence and remove anxieties.

Witty and Kopel (38:231) stressed success rather than failure, regular habits, home cooperation in development of such character traits as initiative and self-direction, more effective social relationships, and a sense of security.

Bond and Tinker (7:104) listed the following as emotional symptoms in relation to reading disability:

shyness or retiring behavior, lack of attentive concentration, habitual nail-biting, a tendency to stutter, lack of self-confidence shown by symptoms of discouragement or by giving up easily, and irritability or aggressive compensatory behavior which draws the attention of other children and disrupts class activities. As a consequence, inadequate emotional stability, insufficient self-reliance, and inability to cooperate may handicap a child in his efforts to learn to read.

Marion Monroe (23:30) relates that fear of making mistakes has weakened many a child's ability to learn, caused him to lose interest and self-confidence, and placed an emotional block between his potential capacities and their free expression.

Monroe (23:256) also points out that favorable attitudes are just as essential to success at the third or fourth grade as at the pre-primer level. Developing the child's self-confidence for learning and an active desire to read are not to be neglected by teachers once the child is initiated into the process of reading. A child's personality growth continues to be modified by his achievements. The well adjusted child applies himself with energy and soon learns; his success in learning maintains his self-confidence and increases his desire to learn more. On the other hand, the maladjusted child

cannot release his energy constructively; he is emotionally blocked and frustrated and fails to learn. Failure adds to his burden of conflicts and despair, creates a dislike for school, and results in undesirable attitudes, rejection of reading, and still more failure.

Thorndike and Woodyard add to this by saying:

It is a matter of common knowledge that a mind which for any reason becomes engaged in an activity and finds itself repeatedly and persistently failing therein, is impelled to intermit or abandon it. The person does abandon it unless this compulsion is counter balanced by some contrary force, such as hope of a turn of the tide toward success, or an inner sense of worth from maintaining the activity or a fear that worse will befall him if he stops (35:241).

Paul Witty wrote:

In recent years attention has been repeatedly directed toward the need for educational programs that are designed to fulfill basic human needs: (1) the need for physical well-being (2) the need for social acceptance and effective group membership and (3) the need for "ego-status" that accompanies attainment of esteemed goals. When needs are reasonably met, individuals tend to be happy and well-adjusted. On the other hand, when needs are denied or inadequately satisfied, maladjustment usually follows. It's not surprising therefore, that writers stress the close association between subject failure and emotional disturbance, since failure in reading may result in the child's loss of social status or self-respect.

Evidence is accumulating in support of the thesis that the learning of any subject must be viewed in terms of the total personality to the learner (37:512).

Helen Zolkos (39:512) reports that reading problems are definitely related to the wholesome adjustment of the child. The child's physical, social, emotional, and intellectual growth and development are closely related

to his behavior and progress in the learning situation. Reading affects the whole organism, and whenever the balance of the organism is disturbed by emotional, physical, or social handicaps, reading efficiency may be greatly reduced.

II. RELATED LITERATURE IN PHYSICAL EDUCATION

Chapter I emphasized that physical education is concerned with an individual's emotional and social development as well as his physical and intellectual development. The following review of literature discusses the views of leading physical educators on emotional and social development acquired through physical education. This section should point out the similarity of the characteristics gained through physical education and those needed to be a successful reader.

Many personal qualities affecting emotional and social development can be cultivated through a well-organized physical education program. Some of the principle ones listed by Dr. Delbert Oberteuffer are (25:134-54):

1. Self-expression
2. Self-appraisal
3. Self-realization
4. Self-determination
5. Emotional control

6. Self-sufficiency

7. Self-direction

An important contribution of physical education is the development of social skills. Individuals failing to develop social skills are seriously handicapped. They do not know how to get along with other children and as a result tend to withdraw from the group, adding to their social and emotional problems. Physical education brings children together in activity under the leadership of capable teachers and helps them learn how to play and get along with others.

Oberteuffer (25:160) believes that motor development often is a vehicle for social and emotional development, that motor activities are the ready means for a child's social contacts with his peers. A child who is backward in motor development has occasion to be angry or afraid in the face of obstacles; the more skillful child will meet them unemotionally.

In discussing the effects of a modern physical education program upon the development of man, Oberteuffer writes:

A well-developed modern program of physical education will seek multiple outcomes, some of which are immediate, some long-range, but all of which are within the reach of competent teaching.

Modern physical education is developed in response to man's needs. It is based upon the facts of man's

nature. Those who teach it study man in his biological and social setting. They analyze the forces which are playing upon him physically, psychologically and socially and construct a program in response to them. They aim to meet adverse forces with counter measures and to supplement the fullest realization of his potentialities.

"Physical" education is not "physical" at all in an isolated somatic or "body" sense. It does not mean an education of the physical. It signifies education through and by means of experiences which are generally associated with physical activity but which have emotional personality, or intellectual ingredients as well. Modern physical education is to be judged by its impact upon the whole man, not merely upon a few parts of him. It seeks the development of personality and personality is defined dynamically as the process of living (25:31-5).

When considering more specific values of physical education, Pearson agreed with Oberteuffer:

Many out-comes can be expected to evolve from a balanced program. These cut across the whole personality, character and physical being of the child and can remarkably alter the profile of the social groups in which he exists. These outcomes may be expected in all the major areas of life, including the physical, social, emotional, intellectual and recreational. Such outcomes constitute many of the competencies necessary for total fitness (26:5).

Most physical educators will agree that the aims of physical education are at all times in line with the main purposes of education in general. Douglass (9:223) said that physical education as well as education in general should produce a self-directive, self-reliant individual, free from mental conflict, healthful in a physical sense, and concerned with the problems of the social group. In a few words, physical education as a

part of the individual's total education should help produce an integrated personality.

Dr. Eleanor Metheny of the University of Southern California made the following statement concerning the contributions of physical education:

With each new experience in movement, the individual finds more pathways leading to a better understanding of himself, to establish his unique relationship to other human beings, and he makes progress toward becoming a better integrated person--mentally, physically and emotionally healthy. . . . This is the psychosomatic potential which exists in every class in physical education (22:28).

Most physical educators agree that physical education is an important phase of children's lives and makes a great contribution to their growth. Children who develop skill in certain physical activities achieve social adjustment and emotional well-being. Cowell (8:141-50) states that motor activities such as games and sports help to build competencies other than motor skills and physical health. They assist social and emotional adjustment and hence change the personality.

Cowell believes the personality involves both negative changes such as the development of withdrawal tendencies, social incapacities, anxieties or frustrations and more positive ones such as discovery of self and realization of one's capacities. Improvement in the capacity for self-analysis and self-direction and better social and emotional adjustment are realistic products of

the physical education experience.

In regard to the socio-emotional outcomes of physical education, Pearson wrote:

Teachers are well aware that such competencies as self-expression, self-control, self-confidence and self-respect are basic to a child's happy participation in society. Skills in these "self" areas can be a natural outcome of a sound physical education program and when used continuously can provide a carry-over value into adult life, just as physical skills can (26:15).

Smith wrote:

Physical education offers opportunity for guidance through the very nature of its activities. Students may play out their anti-social feelings and through this medium resolve many of their problems with the release of tension. Within games and sports are the potentialities for developing self-direction and self-discipline. Along with the freedom of activity is a corresponding sense of responsibility (32:337).

Jones (18:19) indicates that through physical education there is much opportunity for success and through success the child is able to obtain self-assurance and recognition of others.

Halsey and Porter state:

The objectives of physical education are the best possible development of all the children and youth, especially along the closely related lines of physical growth, motor skills, emotional maturity and social adjustment (14:4).

They also believe that

As he learns to climb up and over obstacles and apparatus and to jump down, his skill gives him new confidence. Learning new skills of movement helps him to overcome fear and to avoid frustration. It helps, therefore, in his emotional development.

Another contribution becomes apparent whenever children are guided in playing games. Here there is the process of the common enterprise, the rules which all observe so that the game may go on, the discipline of the self in the interest of belonging to the group (14:34).

Participation in physical activity can provide relaxation and relief from the strain and nervous tension of the school day. It gives the child an opportunity to express himself and make social adjustment within his group. To acquire these the child needs to have the skill to be able to compete successfully with his playmates.

Schoonover (15:983) demonstrated that physical education definitely improves strength, speed, and coordination--prerequisites to gaining skill. In a study Schoonover gave thirty minutes of supplementary instruction in basic physical education skills three times a day for thirteen weeks to an experimental group. They showed significant gains in strength, agility, speed, and power over a control group receiving regular physical education.

Jones (15:981) found that boys high on strength tests in early adolescence tend to be superior in physical development and motor and social performance.

Another study by Biddulph (3:6) indicated a greater degree of personal and social development for high achievers than low achievers of motor performance involving strength, speed, and coordination. Buddulph concluded that other things being equal the individual who has developed a high

degree of motor skill will be better equipped to meet the problems of personal and social adjustment than will the individual frustrated in the motor control of his body.

A study by Blanchard (5:39) concluded that character and personality traits are affected by participation in physical activities, the result being that desirable rather than undesirable traits are stimulated.

Other studies by Cowell (15:989) and Tryon (15:989) indicate that children who are strong and have a good background in play skills are sought after by others and appear to have a favorable social position.

Fear of not being able to accomplish a task has probably caused many children to not attack a new problem with confidence. As LaSalle (20:13) relates, studies of children's fears show that lack of play skills is among the reasons given by the children themselves for being afraid.

Humphrey (16:25) relates Pestalozzi's observations that children approach their studies with a greater amount of interest after enjoyable physical activity, indicating the potential of physical education.

LaSalle quotes Meek as saying:

The boy who lacks skill in and has distaste for organized games is considered fearful and is ridiculed and shunned by the groups whose attitude towards him is one of social ostracism. "Because of this," according to her study, "motor skill becomes an important factor in the individual's feeling of confidence and pride in himself" (20:9).

LaSalle (20:9-10) states that the qualities most admired by seventh grade boys are expertness in organized games, readiness to take daring chances, and leadership in games. The boy who lacks skill or does not like games is considered a sissy and a coward.

Much research indicates that children who perform most proficiently in physical feats are usually the most popular. Consequently, if children are given an opportunity to develop their skills and abilities in physical education, they should have greater opportunity for social acceptance among their peers.

Smith (31:10) told of a study by Axline indicating that improvement in both reading and personality adjustment resulted from a program of play therapy. It was concluded that if the difficulty which some retarded readers show is due mainly to inconsistencies within their value system and if non-directive play therapy can aid the individual in changing his attitude toward self or in re-evaluating his concept, then, correspondingly, changes should occur in subject matter ability after non-directive play therapy.

Learning to read requires alert attention and good concentration. The child must have the physical fitness and health to apply himself whole-heartedly to the task of learning to read. If he fatigues easily, inattention develops; if health is poor, absenteeism results and, as

a consequence, failure in learning to read follows. A good physical education program strives to build and maintain strength, endurance, good health, and other attributes which together constitute physical fitness.

Alley and Bantz (1:26) described a good physical education program as one with activities and sufficient exercise designed to develop the strength and endurance of the child so he can meet the daily tasks and have an adequate reserve as insurance against infectious disorders which seem prone to attack the excessively tired, the worn-out, the run-down individual with weakened resistance.

Several studies have indicated a relationship between strength, social prestige, and personal adjustment. Oberteuffer quotes Rugen as saying:

"There is a tendency for high strength to be associated with good physique, physical fitness, early maturing, social prestige and social stimulus values and an apparent satisfactory level of personal adjustment; and that boys with low strength scores showed pronounced tendencies toward an asthenic physique, later maturing, poor health, social difficulties and lack of status, a feeling of inferiority and personal maladjustments" (25:45).

Betts writes:

General physical condition is related to attitudes, alertness and other factors which facilitate learning. Lowered vitality contributes to a lack of readiness for learning.

Excessive fatigue operates to lower mental efficiency. Low body tone can cause the child to feel that life is just a little rugged (2:635).

Gates (12:103) indicated that physical distress and

poor muscle tone may result from many different causes, any one of which may seriously interfere with the child's success in reading. Such symptoms as lethargy, inattention, irritability, drowsiness, excitement, and nervousness may develop. Gates feels that the child who is fatigued or below par physically often is inattentive or drowsy. In some instances physical difficulties may result in negative attitudes toward learning to read.

III. RELATED LITERATURE IN TRANSFER OF LEARNING

In this study it was assumed that concomitant learnings from physical education will be transferred to and have an affect upon the reading program. Although physical education and reading are not specifically related subjects, it is believed that many of the same characteristics influence success in both areas.

There is no doubt that learning is affected by many conditions. The goal of teaching is to produce desirable changes in behavior which will carry-over or transfer to new situations. What is learned in school is not always for immediate use but for future use. Thus a transfer of learning must take place for schooling to be useful.

Pressey and Robinson say the problem of transfer may be put thusly:

To what extent and in what way will the acquirement of skill, understanding, and attitude in one subject or topic or in one type of situation influence skill, knowledge, understanding, and attitude in another subject or topic or in very different situations.

.....

Narrower in range but still involving the issue of comparative extrinsic value of school subjects is the problem: To what extent does the acquirement of skill, information, understanding, or attitude in one subject effect achievement in related subjects? (27:271-72).

Current educational practices are based on the assumption that children can apply general learning in different or new situations. Studies have proven that transfer of learning does occur, and from these studies several theories on transfer of learning have been developed.

Knapp and Hagman (19:25) briefly define some of the more accepted theories by Thorndike, Judd, Bagley, Pressey, and Robinson, and the Gestalt theory. None of these theories claim to have the answer to transfer of learning, but each contributes to a possible solution to the problem of transfer of learning.

First is Thorndike's theory of transfer according to identical elements. This theory states that specific things learned in one situation become useful in other situations. Second is the theory of generalization of experience advanced by Judd. This theory proclaims that education is training in how to think, how to generalize, and how to be scientific. According to this theory, transfer

is determined by methods of teaching and learning. Third, Bagley has theorized that ideals of procedure such as neatness and orderliness transfer when consciously worked for and when they are emotionalized and given value by the learner.

A fourth theory, proposed by Pressey and Robinson, is transfer by common elements. They reason on the basis of their interpretations of experimental evidence that there may be transfer of fact, skill, or method if there is a common element and if the common element is perceived.

Finally there is the belief of Gestalt psychologists that transfer is accomplished through insight into the whole of a perceived situation and that cues releasing previously formed patterns are important. They deny the identical-elements transfer theory. The whole may give meaning to some of the parts quite different from what they would be if the part stood by itself.

Although very little experimental work has been done in the area of transfer of social and emotional learning, it is thought that transfer of such traits definitely takes place.

Knapp and Hagman present the following statement on the transfer of emotional and social learnings:

If school experiences duplicate out-of-school situations, school behavior may be repeated elsewhere. This might be thought of as transfer of

identical elements or it might well be regarded as simply repetition. There may be transfer through generalization of concepts of how to behave in socialized situations, how to get along with people and how to adjust to emotional tendencies and pressures in conformity with Judd's theory.

Ideals, attitudes, dispositions, self-reliance, perserverance, feelings of confidence and the like may transfer. If Bagley's theory--that attitudes must be elevated ideals and given emotional tone in order for transfer to be effective--is correct, than strong attitudes and emotionalized responses not only transfer as much but become the bases for transfer of associated factors. Attention to attitudes and to emotional aspects of education thus represents the backbone of teaching for transfer according to the Gestalt theory of insight and cues which bring forth previously formed patterns (19:26).

Many studies indicate that positive transfer of learning does take place. This has been proven by many experiments under varying conditions. Since most of the studies were done in areas other than transference of emotional and social behavior, this paper will not attempt to cite these studies. Instead, stress will be put on the conditions conducive to transfer of learning.

Three studies on the transfer of learning were discussed by Gray (13:20). A study by Haskell compared two equal groups in English vocabulary by teaching Latin the conventional way and as it relates to English. It was stressed that the amount of transfer depended in part on whether or not Latin was taught in relation to English.

Another study by Woodrow (17:120) stressed that the method of teaching affected transfer of learning.

Woodrow compared two groups of college students on memorizing tests after they had been given two different types of memory training. The results showed that the group trained to memorize poetry and nonsense syllables was far below the group trained in learning rules for memorizing.

A third study by Werner indicated that intelligence affects transfer of learning. In a series of English usage tests, Werner compared pupils with low, medium, and high intelligence who had studied a foreign language. He found the superior pupils did much better on the tests. The low and medium groups showed little transfer of learning.

Most psychologists and educators believe transfer of learning is most likely to occur under the following conditions.

1. When there is a similarity between two situations. For instance the study of Latin should increase English vocabulary.
2. When the behavior or skill being transferred has meaning to the individual; for example, if the child understands the relationship or applications of a learning.
3. When superior intelligence is present, relationships and transfer are more likely to occur.
4. When teaching methods are organized with transfer of learning as an objective.

Blair, Jones and Simpson make the following statement regarding transfer of learning:

Anything which can be learned can be transferred including such things as attitudes, a feeling of self-confidence, sets and interests, as well as skills, facts and other items generally thought of as constituting school work. Transfer may be quite specific, as when elements of one learning situation form in another. In such case the effects may be either positive or negative, that is a previous learning may either facilitate a new learning or may cause interference. Also transfer may be general, in that a given learning such as a principle, a set, or method has influence upon any number of later learning situations (4:261).

Attitudes formed previously to a learning situation may greatly affect transfer of learning. The child who has unpleasant emotional or social experiences in one situation will not approach a similar situation with as much interest or self-confidence. Blair, Jones, and Simpson (4:255) indicate that transfer of attitudes is a special case of transfer where the self plays an important part. For instance, two children of equal mental potential may differ greatly in their ability to solve problems because one has self-confidence and aggressiveness and the other may be shy and have a tendency to withdraw from difficult problems. Previous experiences obviously conditioned the way they perform.

In relation to attitudes Blair, Jones, and Simpson state:

Children carry to new problems not only skills, principles and knowledge, but also attitudes and

personality traits. These are truly transferable elements and among the most important.

An indirect but neat piece of evidence on how attitudes transfer may be seen in the results of a test in which directions are given not to guess. When this is done, a large part of the measurement is not of knowledge alone, but of personality traits. Students who have had a good share of success and have self-confidence are apt to leave many fewer blank spaces in their answer sheets than those whose experience with tests and with problems in general have been marked by lack of success (4:255).

Transfer of learning is often neither realized nor the relationship to other situations recognized by the child. In many instances the child studies things in school which have no meaning or purpose to him; consequently, he learns slowly and retains very little. Probably the most important single factor in any learning situation at school is the classroom teacher. The tasks of the teacher while teaching transfer of learning is described in the following statement by Johnson, Johnson, and Humphrey:

The critical factor which determines whether or not our more lasting objectives are to be realized is the teacher. The teacher is the key. Most pupils are too young and too immature to be counted upon to see the relationship that exists between play and sports and other and later life situations. . . . Over the years we have become convinced that the teacher and coach who want transfer to take place must assume that teaching transfer is essential if transfer is to take place (17:83).

To gain transfer it is essential that the teacher think through his subject matter and study the generalizations, relationships, and methods that may transfer. Also, transfer depends on how well the teacher can lead students

to see the similarities between the subject matter and its applications.

Blair, Jones, and Simpson give a list of suggestions which should serve for the basis of teaching for transfer:

1. Have clear-cut objectives. Decide what students should be able to do as a result of their work.
2. Study the course content to find what it contains that is applicable to other school subjects and to out-of-school life.
3. Select instructional materials which are best suited to the job of making relationships apparent.
4. Let the students know when to expect transfer, what kind to expect, and the benefits which it can bring them.
5. Use methods of teaching (e.g., problem solving, discussion, leading questions) which will facilitate transfer.
6. Provide practice in transfer. It is not enough to point out relationships. Pupils should be given practice in finding relationships on their own. Tests of application, guided discussion and actual class projects ought to provide this kind of experience.
7. Concentrate on the process of learning as well as upon products. Do not be satisfied with a right answer or solution, but probe to find out why a certain answer was given, and discuss with the class the steps which led to their answers (4:257).

CHAPTER IV

ANALYSIS OF DATA

The sample population for this study was selected by administering three pre-tests used as control variables. The tests were the Durrell-Sullivan Reading Achievement, Durrell-Sullivan Reading Capacity, and the Revised Iowa Brace Motor Educability tests. The subjects, fourth grade males selected by these tests, were divided into an experimental group and a control group of nineteen subjects each. The experimental group was given special motor training for nine weeks. Following the motor training both groups were given post-tests, the motor educability and reading achievement tests, identical to the ones given on the pre-test. The reading achievement test was used as the criterion variable.

After the essential data was obtained, zero order correlations, means, and mean differences were computed to determine the relationship between certain variables in the pre-test and post-test. Furthermore, the control and experimental groups were tested for comparability and significance by using a random group t-test.

I. COMPARABILITY

Table I shows the means, standard deviations, difference between means, and the t's obtained from this

data. On the basis of the computations it was determined that there were no significant differences between the two groups. Therefore, the null hypothesis (that the groups are alike) was accepted.

TABLE I
PRE-TEST COMPARATIVE DATA

	<u>Control</u>		<u>Experimental</u>		Mean Difference	t
	M	σ	M	σ		
Word Capacity	44	7.14	43	5.93	1	.39
Paragraph Capacity	30.4	4.44	29.8	3.41	.7	.58
Word Achievement	14.5	4.45	12.6	4.86	1.9	1.29
Paragraph Achievement	11	3.64	9.4	3.01	1.6	1.50
Motor Educability	47.5	1.92	46.8	9.02	.8	.27

II. CORRELATIONS

Correlations made between different variables may be found in Tables II and III. Table II gives the correlations between variables of the control group, both pre-test and post-test. In the pre-test only one correlation was significant at the .05 level of confidence, that between motor educability and paragraph achievement having a correlation of .459. In both, the correlations were

lower in the post-test than in the pre-test. This would tend to show that after a period of nine weeks there was less relationship between capacity and achievement in reading than before. There was also less relationship between motor educability and each of the reading tests.

TABLE II
CORRELATION COEFFICIENTS FOR
THE CONTROL GROUP

	Pre- test	Post- test
Word Capacity with Word Achievement	.370	.296
Paragraph Capacity with Paragraph Achievement	.192	.152
Motor Educability with Word Achievement	.361	.188
Motor Educability with Paragraph Achievement	.335	.260
Motor Educability with Word Capacity	.380	.227
Motor Educability with Paragraph Capacity	.459*	.399

* significant at .05 level

Table III shows the same information for the experimental group. In the pre-test one correlation was significant at the .01 level of confidence, that between word capacity and word achievement, with a correlation of .703. In the post-test the same variable was significant at the .05 level although greatly reduced from the pre-test. In addition the correlation between motor educability

and word capacity rose from .193 to .470. This latter correlation is significant at the .05 level.

TABLE III
CORRELATION COEFFICIENTS FOR
THE EXPERIMENTAL GROUP

	Pre- test	Post- test
Word Capacity with Word Achievement	.703**	.464*
Paragraph Capacity with Paragraph Achievement	.440	-.149
Motor Educability with Word Achievement	-.122	-.213
Motor Educability with Paragraph Achievement	.275	.339
Motor Educability with Word Capacity	.293	.470*
Motor Educability with Paragraph Capacity	.164	.323

* significant at the .05 level

** significant at the .01 level

An interesting item to notice on correlation Tables II and III is that all the correlations between motor educability and all other tests decreased from the pre-test to the post-test in the control group and increased in the experimental group, with the exception of motor educability and word achievement. This could indicate that the experimental group was performing more in accordance to their abilities on the post-tests than the control group. This is, however, only an indication and certainly cannot be taken as proof.

III. MEANS AND MEAN DIFFERENCES

The mean score (Table I) on word achievement was 14.5 in the pre-test for the control group and 12.6 for the experimental group. After the training period the mean for the control group was 23.2 and for the experimental group 21.7, almost the same increase for both groups. This would seem to indicate that training in motor skills had no bearing upon increase in word achievement.

The same general trend holds true in paragraph achievement. The mean of the control group in the pre-test was 11, in the experimental group 9.38. The post-test means were 17.63 for the control group and 13.96 for the experimental group, an increase of 6.63 for the control group as opposed to a gain of only 4.58 for the experimental group.

IV. T-SCORES

In order to gain a more comprehensive picture of the data obtained, the means of the control group were compared with the means of the experimental group by the use of the random t-test.

First, t-values were computed on the control variable, reading achievement, reading capacity, and motor educability of the pre-test to determine if the control and experimental groups were comparative groups. As

indicated in Table I, they were comparative groups; therefore, the null hypothesis was not rejected.

Following the special motor training given to the experimental group, post-tests were given to both groups and a random t-test was performed on the control variable, reading achievement, to determine any change from the pre-test. Recalling that reading achievement consisted of two parts, paragraph achievement and word achievement, the t-test involved comparing four factors in the pre-test and four factors in the post-test. Table IV shows these results.

TABLE IV

RANDOM T-TESTS FOR THE CONTROL AND EXPERIMENTAL GROUPS

Control Group	Experimental Group	Pre-test t	Post-test t
Word Achievement	with Word Achievement	1.29	.64
Paragraph Achievement	with Paragraph Achievement	1.50	2.71*

* significant at the .05 level

The t-score for paragraph achievement pre-test was 1.50, insignificant for this study. The t for the same tests in the post-tests was 2.71, significant at the .05 level of confidence. However, this change was in favor of the control group, the opposite of what might be expected. Such an occurrence might be attributed to an error in

testing in either the pre-test or post-test or both. It might also have been because of the differences in teaching reading between the control group and the experimental group, teachers in the control group doing the better teaching.

The t-scores on the pre-test between the control groups and experimental groups word achievement was 1.29, insignificant for this study. For the same tests on the post-test the t was .64, indicating no difference between the groups, thus insignificant.

CHAPTER V

SUMMARY AND CONCLUSIONS

As will be recalled from the preceding research, the basic emphasis in this study was placed upon developing the emotional and social traits of the non-reader through physical motor training.

Throughout Chapter III, Review of Related Literature, the importance of emotional and social adjustment of the non-reader was emphasized, and it was pointed out that physical education could do much to provide this type of adjustment. The problem (although it is believed to occur only in certain situations) was whether there would be any transfer of emotional or social adjustment gained through physical training to the reading situation, thus influencing reading achievement.

Expressing the value and importance of physical education to the adolescent was one of the main reasons for beginning this study. The lack of experimental work in this area made the study more complex, but this alone pointed out a need for making such an investigation.

I. SUMMARY

In an attempt to determine if certain traits that may be acquired in physical education would possibly

transfer and affect a pupil's reading achievement, an experimental study was conducted comparing an experimental group given training in motor skills to a control group not given motor training.

Pre-tests consisting of a reading achievement, reading capacity, and motor educability test were given to both groups as control variables. The same tests were given as post-tests to both groups, with the reading achievement a criterion variable.

The data from these tests were analyzed by three methods, zero order correlations, mean differences, and the random t -test.

In the pre-test the control group, with the exception of paragraph capacity with paragraph achievement, had higher correlations between tests than the experimental group. However, the same test correlations in the post-test, with the exception of paragraph capacity with paragraph achievement and motor educability with word achievement, revealed higher correlations by the experimental group. Even though the experimental group's correlations were higher on the post-tests, they were not significant.

Means and mean differences based on raw score for the pre-test and post-test for each group varied little, substantiating the results of the correlations.

Utilizing the t 's of the variables, there was no significance between the groups with the exception of the control group's paragraph achievement, post-test, with the experimental group's paragraph achievement, post-test, which had a t of 2.71, significant at the .05 level of confidence. However, this significance was in favor of the control group, definitely indicating that the motor training given to the experimental group had little if any influence on their paragraph achievement.

II. CONCLUSIONS

The conclusion of this study has to be of three possibilities: First, that training in motor skills does not influence reading, secondly, that if it does it was outweighed by superior teaching in reading by the teacher in the control group, and thirdly, the absences of sufficient design or no relationship make the results ethereal.

Another study of this type using the same reading teachers should be conducted. It is apparent that the reading classes were a variable in themselves; therefore, the motor skill training as the only variable was not valid.

It is recommended that a similar study be conducted with more controls. Such controls would be one reading teacher, control of time spent in teaching reading and having a larger group for the study.

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