Self-concept and gross motor development in kindergarten children
by Kathleen Esther Sorensen

A thesis submitted in partial fulfillment of the requirements for the degree of MASTER OF SCIENCE in Physical Education
Montana State University

Abstract:
This study was initiated to examine the relationship between self-concept and gross motor development in kindergarten children, in male kindergarten children only, and in female kindergarten children only. Prediction of self-concept scores of these children was attempted by the use of the predictor variables age, sex, and 13 gross motor development scores.

Reviewed research and literature revealed conflicting and inconclusive results and theories. This study defined self-concept as the view a child has of his/her role as a learner in school. Gross motor development was defined as the degree of acquisition of static and dynamic balance, running speed, agility, leg power, eye-hand coordination, overhand throwing pattern, and catching ability.

One gross motor development test and one self-concept test were used to assess 37 kindergarten children; 19 boys and 18 girls. Age, sex, 13 gross motor development scores, and self-concept score were established for each child.

Descriptive statistics were computed for all variables and single correlations were computed for pairs of variables. Multiple correlations via multiple regression were computed for the predictor variables age, sex, and each gross motor development score and the predictor variable self-concept score.

There were few significant correlations between any of the gross motor development constructs, age, sex, and self-concept reported for the kindergarten children. With the exception of catching in males there were no significant multiple correlations reported between the predictor variables age, sex, and gross motor development scores and the predicted variable self-concept.

It was concluded that no significant relationship exists between self-concept and gross motor development as assessed by the tools used in the kindergarten children who participated. It was hypothesized that the lack of availability of an appropriate self-concept measure may partially explain the non-significant relationships. It was hypothesized that childrens' self-concepts may be multi-faceted and inconsistent among specific endeavors in areas such as gross motor, fine motor, and academic tasks and in social situations. It was also theorized that kindergarten children may still be ego centered to an extent that they are unable to form generalizations concerning the success of their physical performances.

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Date June 6, 1979

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KATHLEEN ESTHER SORENSEN

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Approved:

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ABSTRACT

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One gross motor development test and one self-concept test were used to assess 37 kindergarten children; 19 boys and 18 girls. Age, sex, 13 gross motor development scores, and self-concept score were established for each child.

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There were few significant correlations between any of the gross motor development constructs, age, sex, and self-concept reported for the kindergarten children. With the exception of catching in males there were no significant multiple correlations reported between the predictor variables age, sex, and gross motor development scores and the predicted variable self-concept.

It was concluded that no significant relationship exists between self-concept and gross motor development as assessed by the tools used in the kindergarten children who participated. It was hypothesized that the lack of availability of an appropriate self-concept measure may partially explain the non-significant relationships. It was hypothesized that childrens' self-concepts may be multi-faceted and inconsistent among specific endeavors in areas such as gross motor, fine motor, and academic tasks and in social situations. It was also theorized that kindergarten children may still be ego centered to an extent that they are unable to form generalizations concerning the success of their physical performances.

CHAPTER I

INTRODUCTION

Children need and deserve more than an education from teachers and schools. They need understanding, patience, guidance and love. They need a base upon which to grow and learn what we, as teachers, have to share. They need positive self-concepts.

The self and attitudes concerning it are learned. Those attitudes toward the self are what help to make children feel good--and feel badly. Perceptions of the self and its worth begin developing at birth. Early childhood experiences are vitally important to the nurturance of the self-concept in the first years of life. Children want to please parents and teachers. Other people considered important to the developing child are especially focal in the formation of early attitudes toward the self.

Humans, including children, tend to strive for emotional balance and consistency within themselves. When experiences support the existing self-image, it is reinforced.

People also tend to be protective of the self and when incidents occur that contradict that self-image, they are usually rejected. When they begin to accumulate and outnumber the others, self-concept begins to change.

Even though self-concepts are quite well formed by the time

children reach schoolage, every experience they have in school influences their self-concepts. Conversely, self-concept has an influence on how children interpret their experiences. Learning environments, in all aspects of social, emotional, academic or physical contexts, affect the self and subsequent feelings of success or failure. Self-concept and learning cannot be separated.

Motor development, as can be evidenced in infants, is a natural phenomenon. As perceptual and cognitive processes begin to develop, motor skills become more than a natural occurrence; their mastery becomes a source of pleasure. Motor skills must be learned; motor skills must be related to self-concept.

Self-concept is a complex phenomenon that seems to be a contributing factor in the determination of behavior in many of the situations in which one is required to think and act. The results of research in this area have been limited, conflicting, and inconclusive. Prominent researchers and theorists in the fields of psychology and education have supported the theory that self-concept and movement are interrelated. The purpose of this study was to increase the knowledge concerning this relationship.

Purposes

The purpose of this study was to examine the relationship between gross motor development and self-concept in kindergarden

children. Specifically, the study was designed to examine the following relationships:

1. between self-concept and gross motor development in kindergarten children.
2. between self-concept and gross motor development in male kindergarten children; and
3. between self-concept and gross motor development in female kindergarten children.

Null Hypotheses

The following null hypotheses were tested:

1. There will be no significant correlation between self-concept scores and gross motor development scores of kindergarten children.
2. There will be no significant correlation between self-concept scores and gross motor development scores of male kindergarten children.
3. There will be no significant correlation between self-concept scores and gross motor development scores of female kindergarten children.

Justification of the Study

Researchers in recent years have attempted to establish the relationships between self-concept and athletic performance, physical

fitness, curriculum design in physical education, and physical performance. The results have been contradictory and inconclusive, partly due to the nature of self-concept and the limited knowledge that exists concerning it. Research concerning the relationship between self-concept and gross motor development in young children is extremely limited. Most of the material available was not specifically concerned with the development of self-concept in young children, nor was it discussed in terms of its nurturance in educational contexts, or presented in such a way that would be useful to teachers (Anderson, 1972). Curry (1974) expressed a need for the body of knowledge to be expanded in the area of self-concept. Snodgrass (1977), as well, stated that the role movement plays in enhancing the self-concept requires additional investigation.

Combs, Kelly, Maslow, and Rogers (1962) all agreed that the views children have of themselves are learned through experience and that children learn about themselves and form views of themselves before, as well as after, entering first grade. Since the self is important to each student, the learning situations provided by school environments are important.

The preschool period in childrens' lives is crucial in that they are beginning to think divergently, formulate attitudes, and develop values that will affect whole-life patterns. If a positive relationship does exist between gross motor development and

self-concept, more physical educators may see a need for planning success-oriented curriculums and adopting success-yielding activities to aid children in forming positive feelings toward movement and the self. By acquiring positive attitudes early in life, an individual may be more likely to continue pursuing an active lifestyle and higher level of physical and mental health. It was the intent of the investigator to address the question, "Is there a positive relationship between self-concept and gross motor development in kindergarten children?"

Definition of Terms

Gross Motor Development. For the purpose of this study, gross motor development was represented by the degree of acquisition of static and dynamic balance, running speed, agility, leg power, eye-hand coordination, overhand throwing pattern, and catching ability.

Self-Concept. Self-concept, as measured by the instrument used in this study, was "how a child views his role as a learner in school. It is the student's sum of experiences, perceptions, attitudes, and feelings about school and school work" (Milchus, Farrah, and Reitz, 1968).

Delimitations

This study was delimited to children whose ages fell between five years and six months and six years and six months on the day

of testing and who were enrolled in one of three classes of afternoon kindergarten in the Bozeman Public Schools, Bozeman, Montana. No children receiving special services were selected as subjects. The study was further delimited to the scores obtained from selected items in the Williams' Gross Motor Coordination Test Battery and Cashin's Test of Motor Development and the responses received from the self-concept items included in the Self-Concept and Motivation Inventory: What Face Would you Wear?

Limitations

The children selected as subjects in this study were not selected in a random fashion and therefore, the results may not be generalized to others outside the sample. The study was limited by the number of children whose parents consented to their participation. The specific constructs of the tools used limited the extent to which self-concept and gross motor development could be measured. The responses of the children depended upon precise and consistent administration of each tool according to protocol.

CHAPTER II

REVIEW OF THE LITERATURE

The self, as the individual known to himself, was studied as early as 1890 in the United States by William James, an introspectionist. During the second, third, and fourth decades of this century, however, behaviorists dominated the psychology field and "self" studies received little emphasis. Writings suggesting a link between psychological theories and psychoanalytical theories, or between cognition and clinical studies, began emerging during the 1940's and 1950's. Empirical studies concerning the "self" in support of these theories did not commence until 1949 (Wylie, 1961). The growing interest during the 1950's can be at least partially attributed to Rogers' (1954) research in the fields of psychotherapy and personality change. During that decade however, few studies were published that investigated the relationship between self-concept and motor performance in elementary or preschool children (Tyler, 1972).

In 1961 Wylie reviewed over 500 studies dealing with self-concept and its development. She described one's conscious self-concept as the phenomenal self and the unconscious self-concept as the nonphenomenal self and was able to categorize and discuss most of the studies accordingly. Rogers, whom Wilie considered a

phenomenologist, has implied that information about the self must come into one's awareness before it can influence behavior. Non-phenomenologists have advocated that one need not be consciously aware of information in order for it to affect outward behavior. Rogers has indicated acceptance of this premise and has stated that experiences inconsistent with one's perceptions are generally denied or altered in such a way as to become consistent and while these perceptions are not verbal or necessarily conscious, they may affect self-concept and behavior (Wylie, 1961).

Each study that Wylie (1961) reviewed was broadly categorized in one of three ways. She grouped those together that were designed to measure general self regard in a phenomenal context. Those studies using measures designed to correlate self-concept with other variables were grouped. Subgroups consisted of parent concepts of child, sex roles, religious affiliation, peer interaction, friend choice, body characteristics, effects of psychotherapy, and susceptibility to persuasion. In this group, no study correlating any aspect of motor ability or development was cited and only one measure was reported appropriate for use with children below fourth grade. Wylie then reviewed the nonphenomenological studies.

Wylie (1961) analyzed each of these studies with respect to requirements for adequate measurement and research design and noted the limitations in their methods. Constructs concerning the self

have not been classified because they have tended to be vague, incomplete and overlap. The amount of substantial findings up until that time was disappointing. Wylie expressed that pioneering in a field is difficult but that if constructs can be identified and methodological flaws avoided, self-concept research can begin producing credible results.

Merriman (1960) reported a positive relationship between motor ability on the Phillip's Jump Chin Run Test of Motor Ability, the personality traits of poise, ascendance, self-assurance and IQ, and the interest modes of 808 high school boys. Those with higher motor abilities scored significantly higher in personality traits and interest modes than those in the lower ability group.

Smith and Clifton (1962) investigated the relationship between self-concept and motor performance in college students. They found that the closer their subjects' self-images were to their ideal self-images, or what they aspired to be, the higher their self-concepts.

A major advancement occurred in the study of childrens' self-concepts with the development of a reliable and valid measurement tool. Piers and Harris (1964) designed an instrument for indicating childrens' feelings about their physical abilities, physical appearance, general states of well-being, social competencies, and school achievement. However, since mastered reading skills were a

prerequisite, the test was not appropriate for children below second grade.

In the area of physical education, Woods (1966) studied relationships between body image, estimates of body space, and performance of gross motor tasks. She found that children tended to underestimate their body size, spatial concepts, and improvement in gross motor tasks.

Torbert (1972) found relationships between gross motor performance tasks and self-concept scores of 100 sixth grade boys after administration of the Lincoln-Oseretsky Motor Development Scale, eight selected motor tasks, and the Piers-Harris Self-Concept Scale. The investigator reported higher overall self-concept scores for boys proficient in the 50-yard dash. The construct physical appearance self-concept was higher for those boys proficient on the eight selected motor tasks which required power, speed, and strength. The eight task combination was also positively related to popularity self-concept. There was no difference in self-concepts between the high and low proficiency groups on tasks requiring agility, balance, or manual manipulatory coordination. Combined scores from the gross motor tasks and the eight power, speed, and strength items did not correlate with higher overall self-concept scores.

Kay et al. (1972) also reported a relationship between

proficiency in the 50-yard dash and overall higher self-concepts in junior high school aged boys. Further supporting Torbert's findings were Sonstroem's (1974) in which a higher relationship was reported between gross motor tasks and self-esteem than between measures of flexibility and balance and self-esteem.

In a study involving female university students, Floyd (1973) examined the relationship between self-concept and physical performance. There was no significant relationship found between the components self description, self-acceptance, ideal concept, or a discrepancy score and physical performance.

Thirty-five boys rated as having emotional and adjustment problems and 35 boys rated as not having these problems by their teachers were administered the Piers-Harris Self-Concept Scale and a perceptual motor battery by Lord (1973). The 35 well-adjusted boys scored significantly higher than the 35 boys rated as not adjusted on the self-concept measure but differences on nearly all the perceptual motor tasks were not significant. The only exceptions were the visual achievement tasks.

In 1973 Albins attempted to find a relationship between self-concept and motor performance in 30 sixth grade girls, 30 eighth grade girls, and 30 college women. The Tennessee Self-Concept Scale and three measures of motor performance involving the Photoelectric Rotary Pursuit Tachometer, the Mirror Tracer, and the Dekan

Automatic Performance Analyzer were made. The only positive correlation between self-concept and motor performance occurred in the eighth grade group with the pursuit tachometer.

Cobb (1975) also reported low correlations between self-concept and perceptual motor abilities in 131 children in grades kindergarten through second who participated in a perceptual motor program. Lamport (1976), on the other hand, sampled 102 learning disabled boys and girls aged eight both before and after participating in a perceptual motor program and found that the boys showed significant improvement in self-concept even though the girls did not. In working with four year olds in a self-concept enhancement program involving physical, intellectual, emotional, and social activities, Landry and Pardew (1973) found that they were able to significantly increase childrens' self-concepts, as measured by the Thomas Self-Concept Values Test and the Development Profile, Human Development Program.

Luebke (1977) made a comparison of the effects of two programs of elementary physical education on 73 third grade children. She pre-tested self-concept, knowledge of activity, physical fitness and time spent in purposeful activity during physical education class. During a 16-week experimental period one group received a traditional physical education program consisting of units such as ball skills and gymnastics. A second group participated in movement education and the third group, a control group, received no physical education.

After the experimental period, the children were post-tested in the same manner. No significant differences were reported in self-concept, knowledge of physical activity, or physical fitness among any of the third graders.

Tyler (1972) investigated the relationship between self-concept and motor performance of second grade children. She determined high and low self-concept groups of males and females within the sample. She then determined low and high motor performance groups of males and females within the sample. The groups containing high self-concept and high motor performance scores were treated statistically to determine the correlation, and the same treatment was applied to those in the low groups. No significant correlation was found between self-concept and motor performance and this was attributed to the averaging effect. It was also reported that boys in the sample had higher self-concepts than girls at the second grade level. It could not be concluded however that self-concept is influenced by motor performance. It was thought by Tyler that socialization and experience were responsible factors in the higher male self-concepts. The group exhibiting positive self-concept showed no significant correlation between self-concept and any of the items used to test motor achievement. The group exhibiting negative self-concept showed correlation with three test items; the boys' negative self-concepts correlated significantly ($T = .53$; $p \leq .01$) with poor

performance in the 40-yard run. The girls' low self-concepts correlated with the soccer punt significantly ($r = .51$; $p \leq .01$) even though they performed at an average level. The girls' low self-concepts were significantly correlated ($r = .44$; $p \leq .05$) with low performance in the side stepping test item.

Thompson (1977) studied the relationships among 218 fourth, fifth, and sixth grade boys' and girls' physical performance scores, estimations, and aspirations of physical performance and self-concept scores. The children estimated their class rank orders of performance on each item in the AAHPER Youth Fitness Test and their class rank orders of their total scores on the Iowa Brace Motor Abilities Test before they were administered. Immediately following their performance on each of the items on the fitness test and after completing the motor abilities test, the children recorded the class rank order of their aspirations. Responses to each estimation and aspiration by each child were then ranked within their classes. Actual physical performance scores were also ranked.

Three different scores of class rank order were computed for each child on each fitness test item and the total score on the motor abilities test. An estimation-actual score was obtained by subtracting the actual score from the estimated score. An aspiration-actual score was obtained by subtracting the actual score from the aspiration score. An estimation-aspiration score

was obtained by subtracting the aspired score from the estimated score.

Seven sets of scores underwent a correlational analysis. They were actual physical performance scores, estimation scores, aspiration scores, estimation-actual scores, aspiration-actual scores, estimation-aspiration scores, and self-concept scores. There were no significant correlations between self-concept and the childrens' estimations of their physical performance compared to their actual scores and the relationships of these differences.

The author reported 43 of the 56 possible correlations as statistically significant ($r \geq .138$) when relating childrens' class rank estimations of physical performance with the self-concept factors. Only two physical performance factors correlated significantly with class rank aspirations but 46 of 56 possible correlations between actual class rank performance and specific self-concept constructs were significant. Total self-concept scores correlated significantly ($r = .30, .36, .19, .18, .29, .16, .19, .33$; $p \leq .05$) with standing broad jump, shuttle run, situps, pull ups, 600-yard run/walk, flexed arm hang, motor ability, and 50-yard dash, respectively.

The relationship of the differences between aspiration and actual scores related negatively to self-concept in the items standing broad jump, shuttle run, 600-yard run/walk, and 50-yard

dash. The relationship of the differences between aspiration and estimations of physical performance to self-concept was significant in only two cases.

The author concluded from her findings that children with higher actual class rankings in physical performance had more positive self-concepts. Those children also had higher estimations of their physical skills. She also concluded that those children could accurately estimate their actual physical performance scores, that children with higher self-concepts did not necessarily aspire higher, and that children who have little difference between actual, estimated, and aspired class rankings did not necessarily have higher self-concepts.

Psychologists and researchers in the fields of general education and physical education have agreed that self-concept is learned and that early childhood experiences are vital in its formation. Snodgrass (1977) viewed the self-concept as a human attribute that must be achieved; its development beginning soon after birth, stabilizing by age 11 or 12, but continuing to grow and change throughout life. Yamamoto (1972) stated that the self-concept evolves from early physical and mental experiences and that home and school environments are major forces in the development of the concept. Therefore, the teacher must seek to understand the individual child in addition to teaching the traditional curriculum. Curry (1974)

expounded upon the learned self-concept theory by reversing and thereby strengthening the general self-concept philosophy; she indicated that self-concept, in turn, has a significant effect on learning. Understanding self-concept should help teachers structure the learning environment to facilitate enjoyment and success.

To develop these theories further is to assume that self-concept and early learning experiences will have some impact on whole life patterns (Keister, 1973). Young American children spend a large portion of their waking hours in school, and many of the relationships formed in that environment are significant to them. Since those years are the most critical in the formation of self-concept, the preschool, kindergarten, and elementary teachers' roles are crucial ones.

Learning models have illustrated the importance of motor development as a basis for the acquisition of perceptual processes and the subsequent cognition processes required in higher level learning (Williams, 1973). It seems that both motor development and self-concept are fundamental to the learning process. Snodgrass (1977) saw self-concept as an integrating factor in all behavior, all human behavior as involving movement, and movement as the base in human functioning. Acquiring motor skills is a basic drive and aids children in achieving higher levels of desired independence.

Yamamoto (1972) also saw an interrelationship between the motor

domain and self-concept. He advocated teachers observing the motor behavior of students, identifying their motor coordination strengths and deficits, and encouraging them to excell in the strong areas as well as attempting to improve the weaker areas. The purpose was to prevent feelings of inadequacy from permeating all areas of the childrens' endeavors. Cratty (1970) supported this allegation by stating that children who have difficulty managing their bodies almost always have poor self-concepts.

While theories tend to support a positive correlation between motor development and self-concept in children, there still seems to be only a small number of published research articles which can statistically support them.

Summary

Self-concept has been the subject of research since the late 19th Century. It was not until nearly 1950, the dawn of the humanistic period, that empirical studies began emerging in the literature. Since then, self-concept theories have gained momentum but much of the work has been specialized, scientific research. Therefore, many of the conclusions and theories are still in a state of indecision and conflict. The studies of Merriman (1960), Torbert (1972), Kay et al. (1972), Sonstroem (1974), and Thompson (1977) reported results supporting a positive relationship between self-concept and

at least some constructs of motor performance. None of these studies involved young children. Floyd (1973), Lord (1973), Albins (1973), Cobb (1975), and Tyler (1972) all reported results that indicated a lack of relationship between motor performance and self-concept and conflicted with the general theories proposed in the 1950's and 1960's. The lack of incongruity in so many of the studies is not clearly understood.

The total number of studies that have investigated the relationship between movement and self-concept is limited and even fewer numbers have investigated that relationship in young children. It is difficult to measure constructs as abstract as those proposed to identify self-concept in early childhood. The purpose of the current study was to further examine the relationship between motor development and self-concept and to seek that knowledge about young children.

CHAPTER III

METHODOLOGY

The purpose of this study was to investigate the relationship between gross motor development and self-concept in kindergarten children. Kindergarten children were assessed in their regular school environments. The method by which this was accomplished is presented in the following order: 1) selection of subjects, 2) instrumentation, 3) administration, and 4) analysis of data.

Selection of Subjects

All children enrolled in three afternoon kindergarten classes of two elementary schools in the Bozeman Public Schools, Bozeman, Montana were invited to participate in this study. Introductory letters and permission slips (Appendix 1) were sent home with the children to their parents. Of those 62 children whose parents received the letters, 49 granted permission. From the 49 children in the population, those children with ages between five years and six months and six years and six months on the date of testing and who were receiving no special services were selected as members of the sample. The sample comprised a group of 37 kindergarten children; 19 boys and 18 girls.

The children participating in the study were in self-contained,

regular education classrooms. Since they began kindergarten in September, 1978, they had been receiving physical education twice weekly for 20-minute periods.

Instrumentation

Two instruments were used in the assessment procedures. The Combined Williams/Cashin Gross Motor Development Test was used to measure the eight constructs of gross motor ability in each child. The Self-Concept and Motivation Inventory: What Face Would You Wear? was used to measure self-concept.

Gross Motor Development Assessment

A total of 13 items comprising the Combined Williams'/Cashin Gross Motor Development Test (CWCGMDT) (Appendix 2) were selected from Williams' Gross Motor Development Test Battery and Cashin's Test of Motor Development. These items were used to measure the gross motor development of each child. The five items prescribed by Cashin partially overlapped Williams' nine test items in that each set provided for assessment of static and dynamic balance, speed, and agility. Items from each of these tests were selected and combined for two reasons: 1) to avoid redundancy that would be created by using both tests in their entirety and 2) for their appropriateness to this study. Factor analytic studies by McCloy (1937) and Fleishman (1961, 1964) have supported the theory that motor skills,

while being specific, can generally be clustered into groups. These skill groups, with the exceptions of flexibility and speed of limb movement, were represented in the items comprising the CWCGMDT.

Some items included in Williams' and Cashin's original test batteries required a higher level of verbal comprehension than others. Since the purpose of this study was to examine, in part, the levels of gross motor development, the factor of higher level comprehension was eliminated to the greatest extent possible.

Those test items selected from the Williams' Gross Motor Development Test Battery have reliability coefficients ranging from .70 to .86. Both sets of test items have been used in Ohio and norms have been established based on students' performances there. The norms were of no concern in this study.

Self-Concept Assessment

The preschool/kindergarten form of the Self-Concept and Motivation Inventory: What Face Would You Wear? (SCAMIN) (Appendix 3) was used to measure self-concept in this study. The test was originally designed to report three separate scores of motivation and self-concept: 1) motivation: goal and achievement needs; 2) motivation: achievement investment; and 3) self-concept. Since the focus of the study involved no aspect of motivation only the second half of the test items that dealt with self-concept were

administered. This procedure could be considered permissible since that section of the test was scored and normed separately.

The SCAMIN was classified as a non-projective psychological test. The items in the inventory were direct and were verbally administered. The children were asked to respond to each item by selecting the one face of the three provided that most clearly expressed their feelings. The three faces depicted happiness with a smile, neutrality or uncertainty with a straight mouth, and unhappiness with a frown and wrinkled forehead (Appendix 3).

In a teacher-rating field test, Milchus (1978) cross-validated the preschool/kindergarten form of the SCAMIN. He reported statistically significant differences ($p \leq .05$) between the distributions of high and low rated students on the self-concept factor. The study involved 27 children.

Reliability of the preschool/kindergarten form of the SCAMIN was reported to be .79 (Spearman-Brown). No other reliability or validity reports were reported for the preschool/kindergarten form.

Concurrent validation studies were not completed because the authors believed the constructs of self-concept inventories designed for different uses would not be highly related. The SCAMIN was designed for use in the evaluation of educational programs in the school setting.

Administration

Consent forms were returned from each child's parent or guardian before administration of either test was begun. Parents/guardians were advised as to the purpose of the study and their rights to the knowledge of the results. After completion of the study, parents received a letter of explanation (Appendix 4) accompanying their child's scores and the group mean scores on each item of the CWCGMDT and total score on the SCAMIN.

Administration of the CWCGMDT and SCAMIN were done individually during the hours that kindergarten classes are normally in session. A colleague of the investigator who was trained in precise administration of the CWCGMDT tested each of the children according to a schedule arranged between the classroom teachers and the investigator. Following the administration of the CWCGMDT, the investigator inventoried the childrens' self-concepts by use of the SCAMIN. Appropriate environments were established for use in testing at each school building and were consistent between the two schools.

Analysis of Data

All data were analyzed by the Sigma Seven Computer, Montana State University Computation Center, Bozeman, Montana. The following SPSS programs were used:

1. CONDESCRIPTIVE--a subprogram used to compute descriptive

statistics for interval-level data;

2. PEARSON CORR--a subprogram used to compute Pearson product moment correlations for pairs of variables; and
3. MULTIPLE REGRESSION--a subprogram to analyze the relationship between a dependent or criterion variable (self-concept score) and a set of independent or predictor variables (age, sex, gross motor development scores).

Descriptive statistics were computed for all raw scores obtained in testing the sample. Scores were then subjected to tests of significance. All hypotheses were tested at the .05 level of significance.

Hypotheses 1, 2 and 3 were tested by subjecting the raw data to tests of significance that revealed correlation coefficients between self-concept and each gross motor development item, sex, and age. Prior to testing, a correlation matrix was created to eliminate the possibility of multicollinearity. This was done between each of the predictor variables age, sex, and gross motor development scores to insure that no high intercorrelation (.80 - 1.00) existed between any two (Kim, 1975). Since no multicollinearity was evident among any of the variables, they were then used as the predictor variables in a step-wise multiple regression equation. Multiple correlations were obtained for the predictor variables as they related to the predicted variable self-concept score.

CHAPTER IV

RESULTS

A 13 item gross motor development test and a self-concept test were administered to 37 kindergarten children between the ages of five years and six months and six years and six months. The relationships between age, sex, the score of each item on the gross motor development test and the raw score and stanine score on the self-concept test were analyzed. Results are presented in the following order: 1) descriptive statistics; 2) hypothesis testing; and 3) discussion of results.

Descriptive Statistics

Means and standard deviations for age, sex, scores on each item of the gross motor development test and the raw scores and stanine scores on the self-concept test are given in Table 1. For all but three variables, mean performances of male and female kindergarten children were consistent. Discrepancies between male and female mean performance scores occurred on the ball skill tasks throw, catch, and bounce with boys scoring higher.

Hypothesis Testing

Three hypotheses were tested in this study. The results will be presented for each hypothesis according to the following format:

Table 1. Means and Standard Devisions of Age, Gross Motor Development and Self-Concept for Kindergarten Children.

Variable	Males (N=19)		Females (N=18)		All Subjects (N=37)	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
AGE[1]	72.20	3.74	72.06	4.30	71.89	3.71
SBEC[2]	4.19	2.97	6.16	6.84	5.12	5.25
SBEO[3]	12.48	7.59	12.70	6.10	12.33	6.90
DBW[4]	24.88	5.94	24.59	5.73	24.91	5.68
DBWF[5]	3.05	2.40	3.15	2.30	3.29	2.29
DBK[6]	19.27	6.00	18.86	5.57	16.75	8.36
DBKF[7]	4.09	2.70	3.12	2.43	3.37	2.64
AGIL[8]	20.69	2.00	22.03	2.24	20.89	4.18
THROW[9]	32.42	12.77	17.92	8.52	24.14	12.24
CATCH[10]	39.27	7.76	27.39	7.39	33.00	9.70
BNCE[11]	7.18	8.46	3.22	2.24	5.64	7.39
SBJ[12]	37.84	5.59	34.65	7.28	35.84	6.42
HOP[13]	12.02	3.48	12.09	2.99	12.09	3.28
TYD[14]	5.01	.37	5.16	.41	5.15	.42
SELF[15]	28.42	2.06	27.83	3.68	28.38	2.95
STAG[16]	4.00	.88	3.94	1.86	4.11	1.45

[1]age (months)
[2]standing balance eyes closed (seconds)
[3]standing balance eyes open (seconds)
[4]dynamic balance walking (seconds)
[5]dynamic balance walking falls (number of falls)
[6]dynamic balance kneel (seconds)
[7]dynamic balance kneel falls (number of falls)
[8]agility (seconds)
[9]throwing (cumulative score)
[10]catching (cumulative score)
[11]bouncing (number of bounces)
[12]standing broad jump (inches)
[13]50 foot hopping (seconds)
[14]20 yard running (seconds)
[15]self-concept (raw score)
[16]stanine (self-concept)

1. Statement of hypothesis.
2. Description of statistical method of analysis.
3. Interpretation of the relevance of the test statistic.
4. Results of the statistical analysis.
5. Behavioral interpretation of the test statistics.

Hypothesis 1

There will be no significant correlation between self-concept scores and gross motor development scores of kindergarten children.

This hypothesis was tested by subjecting the raw data to multiple regression analysis. Multiple regression analysis revealed coefficients between age, sex, self-concept, and 13 gross motor development scores. A correlation coefficient below .70 would result in acceptance of the null hypothesis, with the resulting conclusion that no significant correlation existed between self-concept and gross motor development among kindergarten children.

Results of the MULTIPLE REGRESSION are presented in Table 2. No significant correlations between self-concept and any gross motor development construct were found. The null hypothesis was accepted and itwas concluded that no relationship exists between self-concept and the 13 gross motor development test items in kindergarten children.

Table 2. Multiple Regression Analysis for Predictor Variables Age, Sex and Gross Motor Development Scores for Predicting Self-Concept in Kindergarten Children

Step	All Subjects (N=37)				Males (N=19)				Females (N=18)			
	Variable	Multiple r	r^2	p	Variable	Multiple r	r^2	p	Variable	Multiple r	r^2	p
1.	AGE	.31	.09	n/s*	CATCH	.43	.19	.05	DBKF	.38	.14	n/s
2.	SBEC	.40	.16	n/s	DBW	.55	.31	n/s	SBEC	.53	.28	n/s
3.	DBKF	.49	.20	n/s	AGE	.66	.43	n/s	SBJ	.58	.33	n/s
4.	AGIL	.52	.27	n/s	SBJ	.71	.51	n/s	TYD	.62	.33	n/s
5.	BNCE	.55	.31	n/s	DBK	.73	.53	n/s	THROW	.69	.48	n/s
6.	HOP	.57	.32	n/s	BNCE	.75	.56	n/s	HOP	.74	.55	n/s
7.	SBEO	.58	.32	n/s	SBEC	.76	.57	n/s	DBWF	.78	.61	n/s
8.	SEX	.59	.34	n/s	TYD	.77	.59	n/s	AGE	.83	.69	n/s
9.	SBJ	.59	.35	n/s	AGIL	.79	.62	n/s	CATCH	.84	.71	n/s
10.	THROW	.60	.35	n/s	THROW	.81	.66	n/s	AGIL	.85	.72	n/s
11.	DBK	.60	.36	n/s	HOP	.83	.68	n/s	DBK	.86	.73	n/s
12.	CATCH	.60	.36	n/s					SBEO	.86	.74	n/s
13.									BNCE	.86	.74	n/s
14.									DBW	.87	.75	n/s

*n/s = not significant

Hypothesis 2

There will be no significant correlation between self-concept scores and gross motor development scores of male kindergarten children.

This hypothesis was tested with the same basic design used to test Hypothesis 1. Multiple regression analysis between age, sex, self-concept raw score, self-concept stanine score and the 13 gross motor development scores was made. A correlation coefficient below .70 would result in acceptance of the null hypothesis, with the resulting conclusion that no significant correlation exists between self-concept and gross motor development in kindergarten boys.

Results of the MULTIPLE REGRESSION are presented in Table 2. There were no significant correlations found between self-concept and any items of gross motor development. The null hypothesis was accepted and it was concluded that no significant relationship exists between the self-concepts and gross motor development of the kindergarten boys.

Hypothesis 3

There will be no significant correlation between self-concept scores and gross motor development scores of female kindergarten children.

This hypothesis was tested with the design used to test

Hypotheses 1 and 2. Multiple regression coefficients were established between the variables age, sex, self-concept raw score, self-concept stanine score, and the 13 gross motor development test scores. A correlation coefficient below .70 would result in acceptance of the null hypothesis. The resulting conclusion would be that no significant relationship exists between the self-concept and gross motor development of kindergarten girls.

The results of the MULTIPLE REGRESSION are presented in Table 2. No significant correlations were found. It was concluded that no significant relationship exists between the self-concepts and the gross motor development of the female kindergarten children.

Discussion of Results

The purpose of this study was to examine the relationship between self-concept and gross motor development in kindergarten children.

Differences Between Mean Scores of Male and Female Subjects

Results of the CONDESCRIPTIVE subprogram (Table 1) revealed consistent results between male and female kindergarten children on 13 of the 16 variables involved. It was expected that differences in age, gross motor development, and self-concept would not vary significantly. On three items of the gross motor test; those involving overhand throwing, catching and bouncing, did vary with boys scoring consistently higher than girls. Differences on these three ball

handling skills may be a result of socialization factors in their culture. Malina (1973) and others have hypothesized that boys may be more physically aggressive and proficient in basic motor and athletic skills than girls as a result of learned activity preferences.

Relationships Between Age, Sex, Self-Concept, and Gross Motor Development Tasks

Univariate correlation matrices were created to eliminate the possibility of multicollinearity between any of the predictor variables to be used in testing the hypotheses. The variables involved were age, sex, and 13 gross motor development tasks. The results obtained by combining the scores of all 37 subjects are reported in Table 3. Tables 4 and 5 respectively, report the single correlations of the variables as they apply to the male and female subgroups.

The only high intercorrelation ($\geq$ .80) was reported between DBK and DBKF. This correlation was expected since the two tasks were obviously related. No high intercorrelations were reported between the other independent variables. These results were also anticipated since the tasks were chosen based upon factor analytic studies (Fleishman, 1961, 1964; McCloy, 1937).

Table 3. Intercorrelations for Gross Motor Development Tasks and Self-Concept Scores for Kindergarten Children (N = 37)

	SBEC	SBEO	DBW	DBWF	DBK	DBKF	AGIL	THROW	CATCH	BNCE	SBJ	HOP	TYD	SEX	AGE	SELF
SBEC																
SBEO	.28															
DBW	.34	.20														
DBWF	.30	.41	.34													
DBK	.01	.05	.03	.06												
DBKF	.17	.07	.01	.27	.73											
AGIL	.02	.08	.01	.13	.30	.25										
THROW	.13	.08	.02	.18	.35	.03	.35									
CATCH	.15	.07	.11	.13	.10	.17	.41	.40								
BNCE	.07	.09	.03	.35	.05	.12	.18	.06	.29							
SBJ	.09	.36	.09	.40	.21	.23	.21	.11	.02	.30						
HOP	.23	.04	.17	.08	.33	.19	.23	.02	.04	.04	.24					
TYD	.01	.15	.05	.13	.05	.03	.01	.15	.28	.01	.26	.32				
SEX	.17	.02	.04	.06	.06	.01	.33	.60	.64	.37	.28	.07	.23			
AGE	.17	.00	.17	.19	.14	.12	.25	.15	.01	.02	.21	.06	.37	.10		
SELF	.19	.05	.14	.05	.14	.21	.27	.09	.10	.18	.02	.22	.15	.03	.31	

r 37 = .32; $p \leq .05$.

Table 4. Intercorrelations for Gross Motor Development Tasks and Self-Concept Scores for Male Kindergarten Children (N = 19)

	SBEC	SBEO	DBW	DBWF	DBK	AGIL	THROW	CATCH	BNCE	SBJ	HOP	TYD	AGE	SELF	STA9
SBEC															
SBEO	.63														
DBW	.01	.17													
DBWF	.18	.55	.46												
DBK	.08	.17	.35	.11											
DBKF	.07	.08	.26	.13	.75										
AGIL	.22	.26	.01	.40	.52	.38									
THROW	.05	.29	.34	.20	.60	.09	.22								
CATCH	.12	.01	.23	.23	.01	.22	.32	.01							
BNCE	.02	.29	.05	.40	.06	.13	.01	.29	.29						
SBJ	.05	.45	.20	.24	.26	.12	.06	.04	.19	.34					
HOP	.07	.10	.07	.04	.37	.34	.45	.19	.13	.25	.20				
TYD	.26	.11	.07	.04	.10	.13	.31	.21	.16	.04	.07	.62			
AGE	.11	.03	.16	.28	.11	.07	.37	.13	.14	.17	.14	.39	.38		
SELF	.07	.07	.24	.09	.19	.07	.38	.21	.43	.16	.33	.34	.00	.22	
STA9	.15	.03	.29	.01	.16	.17	.35	.12	.34	.16	.36	.31	.00	.25	.98

*r 19 = .43; $p \leq .05$

Table 5. Intercorrelations for Gross Motor Development Tasks and Self-Concept Scores for Female Kindergarten Children (N = 18).

	SBEC	SBEO	DBW	DBWF	DBK	DBKF	AGIL	THROW	CATCH	BNCE	SBJ	HOP	TYD	AGE	SELF	STA9
SBEC																
SBEO	.12															
DBW	.45	.13														
DBWF	.34	.22	.47													
DBK	.01	.11	.03	.21												
DBKF	.18	.30	.01	.51	.78											
AGIL	.28	.50	.37	.43	.24	.08										
THROW	.14	.33	.11	.07	.21	.16	.24									
CATCH	.07	.23	.16	.17	.36	.23	.27	.10								
BNCE	.02	.23	.34	.34	.09	.01	.21	.25	.21							
SBJ	.14	.32	.15	.60	.24	.42	.37	.10	.16	.29						
HOP	.47	.01	.24	.12	.14	.01	.12	.31	.24	.03	.33					
TYD	.07	.35	.26	.36	.01	.11	.49	.50	.18	.58	.42	.21				
AGE	.20	.13	.27	.00	.15	.09	.12	.55	.33	.19	.11	.27	.14			
SELF	.29	.04	.14	.00	.30	.38	.26	.02	.10	.01	.08	.24	.14	.10		
STA9	.36	.03	.12	.01	.23	.34	.19	.08	.18	.05	.09	.40	.13	.22	.97	

*r 18 = .44; $p \leq .05$

There were no highly significant correlations reported between any variable and self-concept for either males or females. Several theories have been proposed to explain this lack of relationship. The self-concept measure chosen for this study is one of a very limited number available for use with kindergarten-aged subjects. It was designed for assessing the attitudes of children toward the academic aspects of school for the purpose of evaluating compensatory education programs. It may well be that children have self-concepts toward academic endeavors that are not consistent with their self-concepts in relation to movement and physical skills. If this is true, then there may or may not be a correlation between a child's self-concept in various contexts depending upon the child's particular capabilities. Therefore. the reported self-concept scores may not be valid for use in this type of study.

Since very little information concerning the validation of the preschool/kindergarten form of the SCAMIN was available, its true validity can be questioned. It is not certain that the constructs measured by the tool are consistent with those reported in the literature.

Children of preschool age who have not yet been socialized to the extent of primary and intermediate grade school children may still be ego centric enough to be unable to recognize how their physical capabilities relate to their peers. Thompson's (1977)

research, which conflicts with the present findings, may illustrate such a theory. Thompson's 218 subjects were fourth, fifth and sixth graders whose actual physical performances were reported to be highly correlated ($r = .16$ to $.36$; $p \leq .05$) with self-concept. Furthermore, it is not known if the subjects in this study made any conscious or unconscious relationships between their performances on the gross motor tasks and their answers on the self-concept test.

The gross motor items were individually administered which provided the children with no feedback as to their performances in relation to others' performances. Feedback, or knowledge of results, is a form of reinforcement in which children receive information about the correctness or incorrectness of their performances (Singer, 1968). The feedback, had it been provided, may have been used as a basis for forming attitudes about their successes or failures. In this study, it was possible that the children did not associate success with performing at a high level. Obtaining feedback of this nature may have proven detrimental to the self-concept of the children involved in the study.

Prediction of Self-Concept by Sex, Age, and Gross Motor Performance Scores

The variable most predictive of self-concept for combined male and female kindergarten subjects was age (Table 2) which explained

only nine percent of the variance. No variable for the combined group reached significance.

For boys, the most predictive variable of self-concept was catching ($r = .43$; $p \leq .05$). While this correlation was the only one to reach significance (Table 2), it indicates that there may be a relationship between self-concept and at least some aspects of gross motor proficiency. It may be hypothesized that a higher correlation could have been obtained with a larger number of subjects.

No multiple correlations between self-concept and gross motor variables reached significance for female kindergarten subjects in the regression. The number of falls while walking a balance beam and kneeling was the variable most highly correlated and which explained 14 percent of the variance.

With a single exception, the multiple regression analysis resulted in non-significant correlation coefficients existing between the predictor variables age, sex, and gross motor development and the predicted variable self-concept. This would indicate that there was no relationship between these variables as defined in this study and measured by the instruments used. These results tend to support the findings reported by Tyler (1972) in which no correlation was found between positive self-concepts and motor achievement of second graders.

Summary

The results of this study contribute to the body of knowledge concerning the relationship between self-concept and gross motor development. It has been shown that no significant relationship exists between self-concept and age, sex, or 13 measures of gross motor development. This supports much of the published research but few of the theories by recognized theorists in the field of self-concept study.

The availability of appropriate self-concept measures for the nature of this study seems to be the rationale behind non-significant single or multiple correlations between the self-concepts and the gross motor performances of the kindergarten subjects. It was also hypothesized that the children either had separate self-conceptions of themselves as classroom students than they did as physical skill performers or they made no generalizations about their physical performances with respect to skill level or success. It was concluded that, in general, performance on gross motor development items could not be used to predict self-concept as it was measured by the SCAMIN.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

Purposes

The primary purpose of this study was to investigate the relationship between self-concept and gross motor development in kindergarten children, in male kindergarten children only and in female kindergarten children only. Specifically, prediction of self-concept scores of these children was attempted by the use of the predictor variables age, sex, and gross motor development scores.

The conclusions of reviewed research and literature revealed conflicting and inconsistent theory and results. This study defined self-concept as the view a child has of his role as a learner in school. Gross motor development was defined as the degree of acquisition of static and dynamic balance, running speed, agility, leg power, eye-hand coordination, overhand throwing pattern, and catching ability.

Procedures

One gross motor development test and one self-concept test were administered to 37 kindergarten children; 19 boys and 18 girls. Age, sex, 13 gross motor development scores, and self-concept

scores were established for each child. The gross motor development scores measured: 1) static balance; 2) dynamic balance; 3) running speed; 4) agility; 5) leg power; 6) eye-hand coordination; 7) overhand throwing pattern; and 8) catching ability.

Descriptive statistics were established for all variables and single coorelations were computed for pairs of variables. Multiple correlations via multiple regression were computed for the predictor variables age, sex, 13 gross motor development scores, and the predicted variable self-concept.

Results

There were no significant correlations between gross motor development constructs, age, sex, and self-concept reported for the kindergarten children. With the exception of catching in males, there were no significant multiple correlations reported between the predictor variables age, sex, and gross motor development scores and the predicted variable self-concept.

Conclusions

Based upon the results of this study, the following conclusions can be made. Caution should be exercised in generalizing the results to other populations.

1. No significant relationship exists between self-concept scores and gross motor development scores in kindergarten

children.

2. No significant relationship exists between self-concept scores and gross motor development scores of male kindergarten children.
3. No significant relationship exists between self-concept scores and gross motor development scores of female kindergarten children.

The lack of an available and appropriate self-concept measurement tool seems to be a major explanation of the non-significant relationships. The tool used was designed for a use other than which it was applied because it seemed the most appropriate of those available. Self-concept measurement instruments designed for use with kindergarten children are extremely limited.

It was hypothesized that children may form self-concepts concerning academic endeavors that are not necessarily consistent with their self-concepts concerning physical endeavors. It was also theorized that kindergarten children may still be ego centered to an extent that they are unable to form generalizations about their physical capabilities. It was concluded, in general, that performance on gross motor development tasks could not predict self-concept as it was measured in this study.

Recommendations

Evidence of the relationship between self-concept and gross motor development in kindergarten children is inconclusive. The results of this particular study disclosed no significant relationships and while they support much of the limited published research in this field, it does not support the theories of the recognized theorists. The following recommendations for further research are offered:

Develop a valid and reliable paper and pencil instrument for assessing self-concept as it related specifically to physical performance. This would allow for significant advancement in the field of self-concept study. Such an instrument is needed most for use with children at pre-reading levels.

Further attempts at correlating self-concept and motor development in young children are needed. Longitudinal studies and those involving larger numbers of subjects could be of particular significance.

Studies investigating the relationship between the quality of motor skill performances and self-concept in young children would be of interest and would add a new dimension to the existing research body. Quality studies might include the assessment of the fundamental motor patterns

of walking, running, jumping, throwing, catching, striking, and kicking.

APPENDICES

APPENDIX A

INTRODUCTION LETTER AND PARENTAL PERMISSION FORM

BOZEMAN PUBLIC SCHOOLS

OFFICE OF
PRINCIPAL, EMERSON ELEMENTARY
BOZEMAN, MONTANA

January 17, 1979

Dear Parents,

We are currently initiating a project concerning childrens' self-concepts and their motor ability. The project is designed to determine if there is a relationship between how well children perform on a motor ability test and how they see themselves. We are using kindergarten children in an attempt to show that early physical education programs can achieve positive goals in areas other than just the physical. We would very much like to include your child in this project. It would involve your child taking two tests:

1. The Combined Williams'/Cashin Gross Motor Development Plan which will determine balance, speed, agility, leg strength, throwing skill and eye-hand coordination; and

2. The Self-Concept and Motivation Inventory which will be used to measure self-concept.

The children will be tested individually during the time they are in school. Administration of both tests will require approximately 30 minutes.

Let us assure you that your child will in no way be involved in any testing situation that could prove physically or psychologically threatening. Both sets of tasks will be presented in a 'game like' atmosphere.

You are welcome to review and discuss both tests prior to giving consent. It is also your right to terminate your child's

participation at any time. Both individual and group results will be made available to you. However, to meet the confidentiality requirements these scores will be separated so that the only individual results available to you will be your own child's.

We feel that this project will benefit the Bozeman Public Schools and hope that you will allow yoru child to participate. If you have any questions please contact us.

Sincerely,

Dan Luckett, Principal
587-3155

Kathleen Sorensen

Kathleen Sorensen,
Physical Education
Instructor
586-4153

Parent Permission Form

I, _____, the parent/guardian of _____ do hereby give my permission for my son/daughter to participate in the study entitled Motor Development and Self-Concept in Kindergarten Children. I grant this permission understanding that all information concerning the study will be available to me and that the confidentiality of my child is assured.

_____
Parent/Guardian signature

I do not wish that my child participate in the study entitled Motor Development and Self-Concept in Kindergarten Children.

_____
Parent/Guardian signature

APPENDIX B

COMBINED WILLIAMS'/CASHIN GROSS MOTOR DEVELOPMENT TEST

Static Balance Eyes Closed

Purpose

To assess static balance with eyes closed.

Facilities and Equipment

Stopwatch, calibrated in tenth of seconds.

A two foot by two foot minimum area of indoor floor space.

Test Description

The child will stand erect, place hands on hips, lift non-supporting leg, close the eyes, and balance for as long as possible on one foot. The child will perform the task in shoes, preferably gym shoes. There will be four individually timed trials. The child is considered out of balance if: a) the hands are removed from the hips; b) the non-support foot touches the floor; c) the eyes are opened; or d) there is excessive movement of the body and/or support foot. A single trial is recorded as the number of seconds (to the nearest tenth) the child remains in a controlled balance position. The performance score is the average of the four trial scores. Note: if the child remains in balance continuously for 30 seconds on any

given trial, that trial is automatically terminated.

Directions to Child

"Stand nice and tall and put your hands on your hips. Lift one leg like this (demonstrate). When I say 'start', close your eyes and stand like this for as long as you can without taking your hands away from your hips or touching both feet to the floor. Are you ready? Start."

Reliability

.70

Static Balance Eyes Open

Purpose

To assess static balance with eyes open.

Facilities and Equipment

Stopwatch, calibrated in tenths of seconds.

A two foot by two foot minimum area of indoor floor space.

Test Description

The child will stand erect, place hands on hips, place one foot against the inside part of the supporting leg just below the knee and balance for as long as possible. The child will perform the task in shoes, preferably gym shoes. The child is considered out

of balance if: a) the hands are removed from the hips; b) the non-support foot touches the floor; or c) there is excessive movement of the body and/or support foot. A single trial is recorded as the number of seconds (to the nearest tenth) the child remains in a controlled balance position. The performance score is the average of the four trial scores. Note: if the child remains in balance continuously for 30 seconds on any given trial, the trial is automatically terminated.

Directions to Child

"Stand nice and tall and put your hands on your hips. Stand on one foot and place the other below your knee, like this (demonstrate). Stand like this for as long as you can without taking your hands away from your hips or touching both feet to the floor. Please wait until I tell you to start. 'Okay start'."

Balance Beam Walk - Time and Number of Falls

Purpose

To assess dynamic balance while walking a balance beam.

Facilities and Equipment

A two-inch-wide, floor-level balance beam, ten feet in length.

A twelve foot by two foot minimum area of indoor floor space.

A stop watch, calibrated in tenths of seconds.

Test Description

The child will walk forward the length of the balance beam in heel-to-toe fashion. The heel of one foot must be placed on the beam in such a way that it touches the toe of the other foot. If the child steps or falls off the balance beam, he is instructed to step back onto the beam at the point where he stepped off and continue walking, as before, to the end. Each step off the beam with either one or both feet is counted as one 'fall'. Two scores are recorded for each of four trials: a) the total number of falls; and b) the time (to the nearest tenth of a second) required to complete the balance beam walk. The performance scores are the averages of the four trials for each item.

Directions to Child

"I want you to walk from one end of the balance beam to the other trying not to step off. Be sure to place one foot in front of the other so that it touches every time you take a step, like this (demonstrate). If you step off, get right back on in that same spot and keep walking."

Reliability

.79

Balance Beam Kneel - Time and Number of Falls

Purpose

To assess dynamic balance while walking and kneeling on a balance beam.

Facilities and Equipment

A two-inch-wide, floor-level balance beam, ten feet in length.

A twelve foot by two foot minimum area of indoor floor space.

A stopwatch, calibrated in tenths of seconds.

Test Description

The child will walk forward to the center of a two-inch-wide balance beam which has been marked with an 'X' in masking tape. When the child reaches the center, he/she will kneel, touching one knee to the beam. The child will rise from that position and walk to the end of the beam. Falls are measured and trial scores recorded for each of four trials as for the balance beam walk. The two performance scores are the averages of the four trials.

Directions to Child

"I want you to walk to the middle of the balance beam and kneel down, like this (demonstrate), trying not to step off or fall off. Then, stand up and walk to the end of the beam. If you step off, get right back on in that same spot and keep going."

Reliability

.82

Shuttle Run

Purpose

To assess agility.

Facilities and Equipment

A stopwatch, calibrated in tenths of seconds.

A thirty foot by ten foot minimum area of indoor floor space.

Two tape marks, (a) and (b), ten feet apart with at least fifteen feet of running room beyond tape (a).

Test Description

The child will stand with toes behind tape (a) and face tape (b). On the signal 'Go', the child will run and touch tape (b) with either foot, then turn, run back and touch tape (a) with either foot and continue until he/she has completed ten trips or touched each line five times. The child will complete the final trip by crossing line (a). Time for completing the task on each of four trials is recorded to the nearest tenth of a second. The performance score is the average of the trials. The child will be allowed to rest between trials.

Directions to Child

"I want you to stand behind this line and when I say 'Go', run down to this line, then back to this line, then back to this line ten times, like this (demonstrate). I will count for you. I want you to run as fast as you can and I want you to touch the lines with one foot each time you turn. Do you understand? Are you ready? Go."

Reliability

.85

Throwing

Purpose

To assess the overhand throwing pattern.

Facilities and Equipment

Twelve tennis balls in a container one foot behind restraining line.

A twenty-five foot by five foot minimum indoor floor space.

A bare wall at one end of the floor space.

A three-foot-long restraining line twenty feet from the bare wall.

Test Description

The child will stand behind the restraining line and throw

twelve balls, one at a time, in an overhand manner, as hard as possible against the bare wall. One trial consists of twelve throws. Two trials will be taken. The recorded score for each trial is determined by points accumulated from the twelve throws, according to the rating scale. The maximum points for one trial is 60. The following rating scale will be used to determine the score:

5 points - 1. opposition arm and leg with back swing
2. trunk rotation
3. release of ball beside or just in front of the head
4. forward step on foot opposite throwing arm
5. balance maintained on follow through

4 points - any four of the aforementioned criteria

3 points - any three of the aforementioned criteria

2 points - any two of the aforementioned criteria

1 point - any one of the aforementioned criteria

0 points - did not demonstrate overhand throw at the time tested

The performance score is the average of the two trials. After demonstrating the overhand throw, the assessor shall position himself/herself ten feet in front of and to the non-dominant side of the child. When giving directions, the restraining line should not be mentioned. If the child steps past the line, he/she should be asked to move back by the ball box. If the child throws the ball in any other way than

overhand, mark the score as zero and demonstrate the overhand throw again.

Directions to Child

"There are 12 balls here. Throw one at a time overhand, like this (demonstrate), as hard as you can against the wall. Are you ready? Start."

Catching

Purpose

To assess the ability to catch a large ball.

Facilities and Equipment

An eight and one half inch playground ball.

A twenty foot by ten foot minimum area of indoor floor space.

Three 'X's' side by side, numbered one, two and three and having two feet between each. 'X' number two should be thirteen feet from where the assessor is to stand.

Test Description

The child will stand on 'X' number two, with 'X' number one to his right and 'X' number three to his left. Four types of throws will be made by the assessor: a) aerial throws directly to the child; b) bounce throws directly to the child; c) bounce throws toward 'X' number one, to the child's right side; and d) bounce throws toward

'X' number three to the child's left side. In order for the ball to reach the child at chest level on the bounce throws, it is necessary for the ball to strike the floor about four feet in front of the child's body when bouncing directly at him/her and about a foot closer when bouncing to the left or right. Two trials will be given. There are 12 tosses to the child in each trial with no more than three tosses to any one of the four catching areas. The order of the tosses will be randomly determined prior to the first trial and will be repeated exactly on the second trial. If a toss does not meet the stated requirements, repeat the toss. The recorded score for each trial is determined by points accumulated from the catching rating scale. The maximum number of points for one trial is 60. The following rating scale will be used to determine the score:

5 points - clean catch, immediate one or two-hand grasp and control

4 points - juggle catch, initial hand contact without immediate control followed by two-hand catch

3 points - basket catch, any catch other than the above

2 points - hand contact. ball touched hands but attempt to catch failed

1 point - attempt was made to catch the ball but there was no hand contact

0 points - no hand contact and no attempt to catch the ball

The performance score is the average of the two trials.

Directions to Child

"Move if you have to, to catch the ball. Are you ready?"

Ball Bounce

Purpose

To assess eye-hand coordination needed to bounce a ball.

Facilities and Equipment

An eight and one-half inch playground ball, properly inflated.

A twelve-inch square visibly marked on the floor.

A five foot by five foot minimum area of indoor floor space.

Test Description

After the assessor demonstrates the task, the child is given the ball and asked to stand next to the square. He/she is then asked to bounce the ball inside the square as many times as possible with one hand. While executing the skill, the child should stand in the same place. Four trials are given. A trial is terminated when the child: a) moves away from his original spot; b) bounces the ball outside the square; c) loses control of the ball; or d) executes 75 consecutive bounces. The score for each trial is the total number of bounces performed. The performance score is the average of the

four trials.

Directions to Child

"I want you to bounce this ball inside the square as many times as you can without moving your feet, like this (demonstrate). Begin when I say go. 'Go'."

Reliability

.74

Standing Broad Jump

Purpose

To assess leg power.

Facilities and Equipment

A tape measure, calibrated in inches.

A starting line.

A ten foot by five foot minimum area of indoor floor space.

Test Description

Standard procedures for executing and scoring the broad jump will be followed and recorded to the nearest inch. Three trials are taken by the child. The measurement for each trial will be taken at the heel, hand or other body part that lands closest to the starting line. The performance score will be the average of the three trials.

Directions to Child

"I want you to stand with your toes behind this line. Bend your knees, swing your arms and push off with your toes, like this (demonstrate). When I say 'Go', jump as far as you can. 'Go'."

Reliability

.86

Fifty-Foot Hop

Purpose

To assess agility.

Facilities and Equipment

A stopwatch, calibrated in tenths of seconds.

A sixty foot by ten foot minimum area of indoor floor space.

Two tape marks (a) and (b), fifty feet apart with at least eight feet of space beyond tape (b).

Test Description

The child will practice hopping, first on one foot, then the other, to determine the favorite hopping foot. The child then stands behind tape (a) and on the signal 'Go', hops past tape (b). The child is not permitted to change feet during the completion of any one trial and is encouraged to only go as fast as he/she can and still maintain control of the hopping behavior. The score on each of four

trials is the total time, to the closest tenth of a second, that it takes to complete each fifty-foot hop. The performance score is the average of the four trials. The child will be allowed to rest between trials.

Directions to Child

"I want you to stand behind this line. When I say 'Go', hop on your favorite hopping foot all the way down past me. Hop as fast as you can without falling down. Do not change feet. If you do fall, stand up and keep hopping. Are you ready? 'Go'."

Reliability

.79

Twenty-Yard Dash

Purpose

To assess running speed.

Facilities and Equipment

A stopwatch, calibrated in tenths of seconds.

An eighty foot by ten foot minimum area of indoor floor space.

Two tape marks, (a) and (b), twenty yards apart with at least eighteen feet of running room beyond tape (b).

Test Description

The child stands behind tape (a) and on the signal 'Go', runs past tape (b). The score for each of two trials is the time (to the nearest tenth of a second) required to complete the task. The performance score is the average of the two trials. The child should be allowed to rest between trials.

Directions to Child

"I want you to stand behind this line. When I say 'Go', run as fast as you can down past me. Are you ready? 'Go'."

Reliability

.82

COMBINED WILLIAMS'/CASHIN GROSS MOTOR DEVELOPMENT TEST SCORE SHEET

		TRIAL 1	2	3	4	AVE.		1	2	3	4	AVE.
STATIC BALANCE EYES CLOSED												
STATIC BALANCE EYES OPEN												
DYNAMIC BALANCE WALK	No. of Falls						Time					
DYNAMIC BALANCE WALK/KNEEL	No. of Falls						Time					
SHUTTLE RUN												

		1	2	3	4	5	6	7	8	9	10	11	12	TOT		1	2	3	4	5	6	7	8	9	10	11	12	TOT	AVE
THROWING	TRIAL 1														TRIAL 2														

		BR	TL	TM	TL	BR	BM	TR	BM	BL	TR	TM	BL	TOT	AVE.
CATCHING	TRIAL 1														
	TRIAL 2														

	TRIAL	1	2	3	4	AVE.
BALL BOUNCE						
STANDING BROAD JUMP						
50 FOOT HOP						
20 YARD RUN						

COMMENTS:

CHILD'S NAME _____ DATE OF TESTING _____

AGE _____ SEX _____ EXAMINER _____

APPENDIX C

SELF-CONCEPT AND MOTIVATION INVENTORY: WHAT FACT WOULD YOU WEAR?

Item 13; seal — Turn your page over to the back. At the top is a picture of a seal with a ball. In that top row. . . WHAT FACE WOULD YOU WEAR IF YOUR PARENTS WERE TELLING YOU HOW YOU ARE TRYING IN SCHOOL? [Repeat.]

Item 14; doll — The next row down has a picture of a doll. In that row. . . WHAT FACE WOULD YOU WEAR IF A TEACHER WAS TELLING YOU WHAT KIND OF LISTENER YOU WILL BE? [Repeat.]

Item 15; rabbit — Move down to the row with the bunny rabbit. WHAT FACE WOULD YOU WEAR IF THE BOYS AND GIRLS IN CLASS WERE GOING TO PICK THE BEST WORKERS IN THE ROOM? [Repeat.]

Item 16; boy — Now find the boy on a wagon. WHAT FACE WOULD YOU WEAR WHEN YOU TELL YOUR PARENTS HOW YOU FEEL ABOUT BEING IN SCHOOL? [Repeat.]

Item 17; dog — Everyone look for the row with the puppy dog. In this row. . . WHAT FACE WOULD YOU WEAR IF YOU WERE DOING YOUR DRAWING FOR A TEACHER? [Repeat.]

Item 18; bone — Down to the bottom row--with a bone on a plate. WHAT FACE WOULD YOU WEAR IF ONLY THE GOOD CHILDREN COULD HAVE A PARTY? [Repeat.]

Item 19; dog house — Go back up to the top of the page--to the dog house. WHAT FACE WOULD YOU WEAR WHEN YOU'RE THINKING OF HOW MUCH YOU'LL HAVE GROWN UP BY NEXT YEAR? [Repeat.]

Item 20; truck — A truck is on the next row. WHAT FACE WOULD YOU WEAR IF YOU HAD TO MAKE A PICTURE OF AN ANIMAL THAT WAS HARD TO DRAW? [Repeat.]

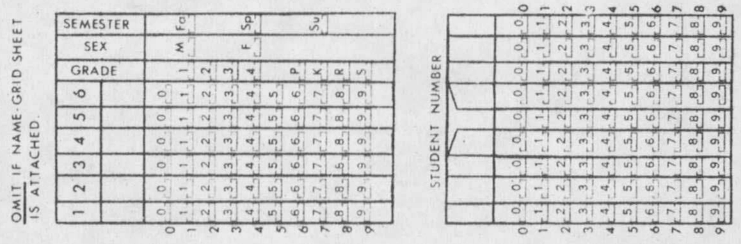
Item 21; house — The next row has a picture of a house. WHAT FACE WOULD YOU WEAR IF SOMEONE WAS TELLING YOU WHAT YOUR CLASS WILL BE LIKE NEXT YEAR? [Repeat.]

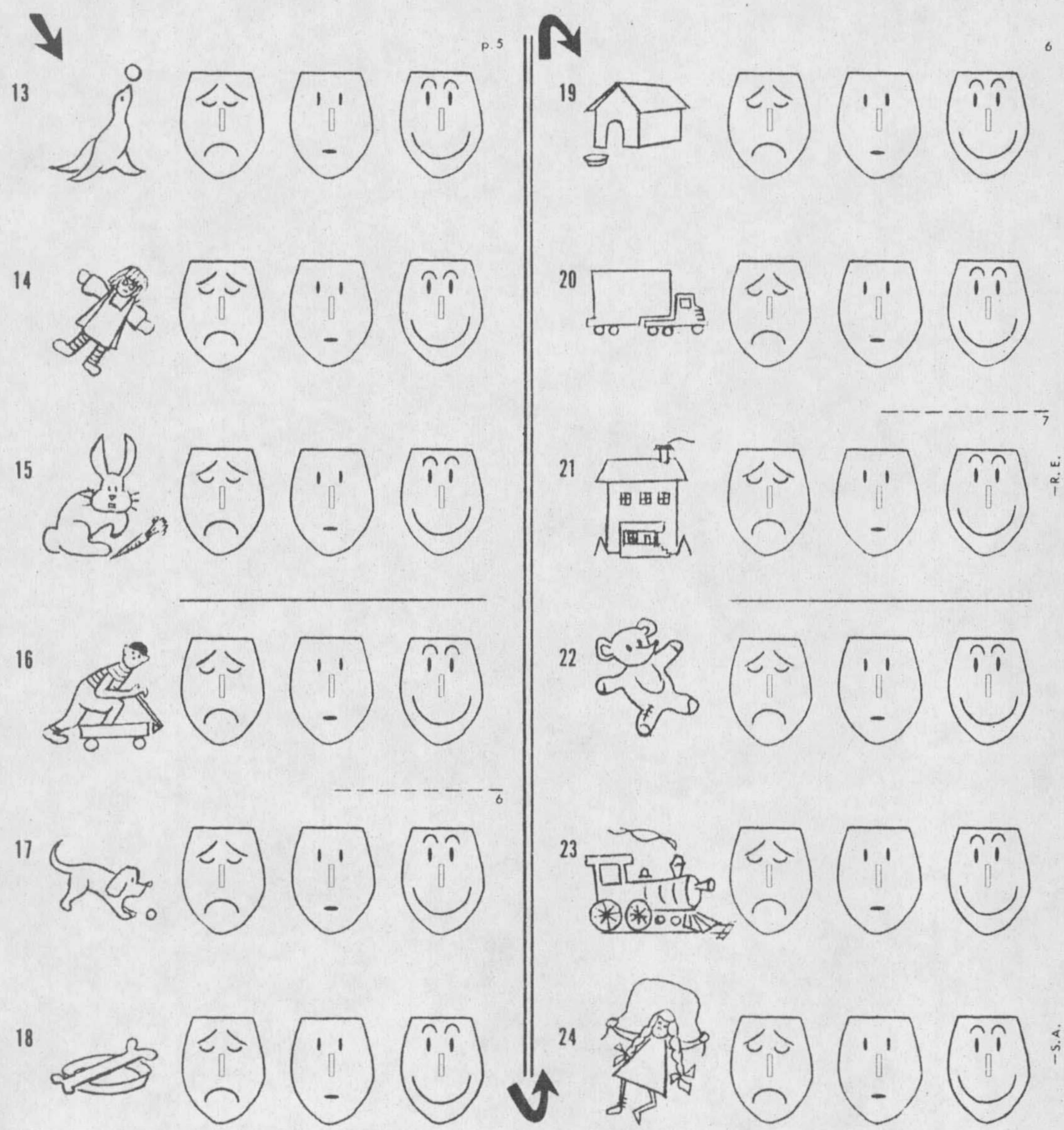
Item 22; Slide your marker down to the row with the teddy bear. WHAT

bear — FACE WOULD YOU WEAR WHEN YOU THINK OF HOW GOOD YOU'RE DOING IN KINDERGARTEN (HEADSTART)? [Repeat.]

Item 23; train — Next is the row with a train. WHAT FACE WOULD YOU WEAR IF YOU TRIED TO LEARN SOMETHING NEW WITH NUMBERS? [Repeat.]

Item 24; girl — One more question. . .the last one. . .in the row near the picture of the girl jumping rope: WHAT FACE WOULD YOU WEAR WHEN YOU THINK OF ALL THE CHILDREN IN CLASS WHO LIKE YOU? [Repeat.]





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UTILITY FORM 3430

OPTICAL SCANNING FORMS™

APPENDIX D

EXPLANATION OF RESULTS TO PARENTS

May 9, 1979

Dear Parents,

You have no doubt been waiting to hear the results of the work we have been doing in the area of self-concept and motor development in the afternoon kindergartens. All of the data has been collected and analyzed. Before you read your child's scores you will want to know some background information:

A total of 37 kindergarten children participated; 19 boys and 18 girls.

The self-concept measure we used was designed to sample young childrens' feelings about themselves in regard to specific situations involving their teachers, classmates, and academic work.

After analyzing the results we found very little relationship between the childrens' scores on the gross motor development test and self-concept test. We do believe that such a relationship does exist, however, and will continue to study in this area and possibly design another project. This work has been some of the first in its field and we hope that in the future it will aid teachers and administrators in helping children achieve and meet with more successes in school.

We sincerely appreciate your interest and willing cooperation in the project. If you have a further interest in the results or your child's performance on any of the tasks please call on us.

Sincerely,

Kathleen Sorensen

Kathleen Sorensen
Physical Education
Instructor
586-4153

Craig Stewart

Craig Stewart
Department of Health and
Physical Education,
Montana State University
994-2260

_____
your child's name

task	_____'s scores	the average scores of all 37 children who participated
1. standing on one foot with eyes open	_____ sec.	12 sec.
2. standing on one foot with eyes closed	_____ sec.	5 sec.
3. walking a 10' x 2" balance beam, toe to heel	_____ sec.	25 sec.
4. number of times the child stepped off a 10' x 2" balance beam while walking toe to heel	_____	3
5. walking a 10' x 2" balance beam, kneeling once in the center	_____ sec.	17 sec.
6. number of times the child stepped off a 10' x 2" balance beam while walking and kneeling once in the center	_____	3
7. agility run	_____ sec.	21 sec.
8. overhand throwing pattern	_____	24
9. catching an 8 1/2" playground ball	_____	33
10. bouncing a ball inside a 12" square	_____ consecutive bounces	6 consecutive bounces
11. standing broad jump	_____ in.	36 in.
12. 50 foot hopping	_____ sec.	12 sec.

13. 20 yard running	_____ sec.	5 sec.
14. self-concept measure (scored on a scale of 12-36, 36 being the highest)	_____	28

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