San Fernando Valley State College

DEVELOPMENT AND VALIDATION OF A FILM
AND INSTRUCTIONAL MANUAL FOR
TEACHING THROWING TO PRE- AND ELEMENTARY SCHOOL CHILDREN

A Thesis submitted in partial satisfaction of the requirements for the degree of Master of Arts in

Physical Education

by

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ABSTRACT

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An inservice training film and manual on the development of the overhand throw was prepared for the use of pre-school and elementary school teachers for teaching the skill of throwing. To validate the usefulness of this film and manual, a study was conducted. The study lasted for twelve school days and involved 140 students in pre-school, kindergarten, and first grade. The experimental kindergarten and first grades were at the Rio Plaza Elementary School and the control kindergarten and first grades were at the Rio Real Elementary School, both in the Rio School District. There were only two preschool classes in the district, both at the El Rio Elementary School, hence one class served as the experimental group and the other the control group.

The students were all filmed both before and after the research began, as they threw a tennis ball into a net three times. This was done to determine their throwing ability. The t test was used to determine if there was any significant difference between the control
groups, who were provided with the film and manual.

The results of the study were:

1. There was no significant difference in the improvement between the control group and the experimental group at the pre-school level.

2. There was significant improvement at the 5% level of confidence in favor of the experimental kindergarten group over the control group.

3. There was significant improvement at the 1% level of confidence in favor of the experimental 1st grade over the control 1st grade.

4. All the experimental groups, considered as a whole, showed significant improvement over the combined control groups at the 1% level of confidence.

Due to these results, the null hypothesis was rejected in every case except for the pre-school groups who apparently were unable to accept the training and aids offered.

The findings indicate that the film and manual are valid tools in aiding teachers to teach the skills of the overhand throw in the elementary school. This being true, other tools, similar to these, designed to promote the development of other motor skills and motor movements, could benefit elementary school teachers, and, consequently, their students.
CHAPTER I
INTRODUCTION

Physical educators are beginning to realize that physical education is not meeting the needs of elementary school children. The children are not learning motor movements and motor skills, such as hopping, skipping, jumping, running, catching, and throwing, all of which are necessary for proper learning and performance of sports skills in the future. When these children move into junior and senior high school, the physical education teacher assumes that they know these motor skills, and, as a result, these essential skills may never be taught. Instead, time is spent learning the specific skills required for specific sports. Poor experiences may develop due to the lack of a good foundation on which these specific skills may be built. The student may become frustrated and discouraged because of his inability to perform the skills with any degree of proficiency. As a result, bad feelings may develop in the student toward physical education and in his participation in physical activities.

How can efficient movement and good motor planning become a part of every elementary school child's educational experience? The answer lies in either of two alternatives: (a) Specialists in physical education may be hired to teach on the elementary level; or (b) Better training in physical education may be provided for elementary teachers.
The Problem

Statement of the Problem

The problem considered in this study was to investigate the effects of training pre-school and elementary school teachers in the art of the overhand throw and their subsequent ability to teach this skill to students. Training was given the teachers by means of an inservice type of film showing the development of the mature form of the overhand throw. A manual was also given to these teachers, to be used as a reference during the study.

Statement of the Purpose

It was the purpose of this study to determine whether an inservice training film and manual for teachers on the development of the mature form of the overhand throw can aid teachers in teaching this skill to children.

Hypothesis

The investigation was designed to test the following null hypothesis: The ability of a child to use the mature form of the overhand throw will not be affected by the teacher's knowledge and instruction in the skill.

Scope and Limitation

The study dealt with 140 boys and girls. The subjects were pre-schoolers, kindergarteners, and first graders, ranging in age from four to seven, in the Rio School District of Oxnard, California. Six teachers were involved in the study. These teachers were regular teachers in the pre-school, kindergarten, and first grades of the Rio Plaza Elementary School, Rio Real Elementary School, and El Rio
Elementary School. The schools were chosen because the students attending were from very similar backgrounds. Eighty-six percent of these schools' populations were of Mexican-American extraction, the families having three or more children. Their socio-economic status was considered lower middle class. All of the elementary schools in the Rio district were equipped with similar facilities and equipment.

This study involved one kindergarten and one first grade from Rio Plaza and one kindergarten and one first grade from Rio Real, the Rio Plaza students comprising the experimental group and the Rio Real students the control group. There were only two pre-school classes in the Rio district, both located at the El Rio Elementary School, therefore, one was considered the experimental group and the other the control group.

The study was conducted over a period of twelve school days. All of the students involved in the research were filmed as they threw a tennis ball overhand into a net just before the study was begun. Each child's throw was carefully analyzed and recorded on a check sheet to determine a pre-test score of his throwing ability. The inservice training film was shown to the teachers at Rio Plaza Elementary School and to one of the pre-school teachers at the El Rio Elementary School. The manual was given to these teachers three days before the study was begun. All of the teachers from the Rio Real School and the other pre-school teacher from the El Rio School were taught the art of throwing overhand, without the training aids. At the conclusion of this study, the students were again
filmed as they threw the tennis ball into a net. Their throwing ability was analyzed and compared with the first performance. A t test was administered to determine any statistically significant difference between the two groups.

A pilot study was conducted at another school in the Rio School District, the El Rio Elementary School. This school was chosen because the students were of similar background as the students in this study and the school was equipped in much the same manner. This was done to give the experimenter an opportunity to practice analyzing the film showing the students in the act of throwing and to adjust the check sheet used in the analysis so it would be more workable.

Assumptions

The study was based on the following assumptions:

1. The mature form of the overhand throw can be taught.
2. The students at these ages of maturation are able to learn the mature form of throwing.
3. The students involved in this research project will not practice the overhand throw outside of the twenty-minute instructional period during the twelve school days of the study.
4. The teachers who are teaching the overhand throw are of equal teaching ability.

Importance of the Study

The importance of this study was based on:

1. The need to instill in elementary school teachers the knowledge and ability through which they may teach physical skills to children.
2. The need to provide elementary school teachers with a tool or source of reference from which they may gain knowledge as to the development of the mature form of throwing and, thus, may do a better or more effective job of teaching this skill.
3. The feasibility of teaching other motor skills or motor movements in the same or in a similar manner, thereby improving the physical education experiences for elementary school children.

Definition of Terms

The following terms are defined as they are used in this study:

1. **Throwing skill** is "the ability to project an object accurately and with sufficient force through space (with the arm). (It) requires coordination of many distinct mechanisms which require many years of experimentation and practice on the part of the child before a mature pattern is developed." (3:123)

2. **Mature**—"a state of full development, perfected." (15:908)

3. **Form**—correctness of technique, body position, and movement. (15:568)

4. **Overhand**—"performed with the hand raised above the elbow and the arm above the shoulder." (15:1043)

5. **Stage**—"a period, level, or degree in a process of development, growth, or change." (15:1417)

6. **Mature form of the overhand throw**—the final stage of development, a correct throw.

Organization of the Remaining Chapters

The following chapter, Chapter II, consists of a review of related literature pertaining to the mature form of throwing, as well as a review of research performed by the Army and Navy in the area of audio-visual aids and their effectiveness in teaching.

The chapter following the review of literature deals with the actual procedures and organization used in the research. Chapter IV contains the analysis of the data. The final Chapter contains the summary and conclusion of this study, along with the investigator's recommendations for further study.
CHAPTER II

REVIEW OF RELATED LITERATURE

The purpose of this Chapter is to review the research which deals with the overhand ball throw. There has been some research done on the different forms of throwing, such as, the overhand, the underhand, the sidearm, in addition to a review of the different objects which may be thrown. However, this study is only concerned with the overhand ball throw.

The recorded research dates from the 1930's, but very little was actually done until about the late 1950's. Wild performed an extensive study in the development of throwing behavior (17:20-24). Glassow and Rarick have done extensive studies in finding ways to improve motor skills and for measuring motor development (10). Much of the research in this field is limited because of the small number of subjects used in the studies, thus making it difficult to draw valid conclusions.

Another purpose of this Chapter is to review the research available in the area of audio-visual aids. Is a film an effective device for teaching this skill? If so, what are the qualities or criteria which make it effective? These and other questions will be answered within this Chapter.

Development of Throwing

Studies reveal that a child makes his first throwing attempts within the first year of life, in fact, at about six months of age. Cratty, however, feels that it is not really clear whether an infant is actually attempting to throw, or whether he is "simply
moving the arm in a rapid arc and the subsequent loosening of the
object which happened to be in the hand at the time" is interpreted
as a throwing motion. It is not clear "whether inherent throwing
patterns are manifested (5:22)."

Gesell reported on a research project in which the tester rolled
a ball to the child to see how much of a throwing response was
demonstrated (6:85). After confidence was established between the
child and the tester, the child was asked to throw the ball from a
sitting position. The child involved in this experiment was about
40-weeks-old. The throw was quite crude in nature and the child
either held onto the ball too long or just let go of it without any
attempt to direct it toward the tester.

Another study by Gesell and Amatruda showed that a child of
12-months can definitely throw a ball after the examiner had first
demonstrated the throw (7:70, 78). Children used in this experiment
demonstrated a great variety of throwing patterns. The ball was
rolled, or tossed, with an underhand, sidearm, or overhand throw.
The children still were unable to time the release of the ball
accurately. When the overhand throw was used, the child tended to
let go of the ball above his shoulder, or not until he had finished
the downward movement of the hand. The shoulder has a major part
in the throwing movement. However, the one-year-old child's movements
are almost all in the shoulder and there is little movement in the
elbow and wrist. These studies demonstrate that throwing begins to
emerge in the first year of life.
While a baby must first perfect his ability to release his hold on an object, Gesell stated that the ability to throw becomes quite apparent at 15-months. As a child sits in his high chair, he finds apparent enjoyment in throwing things off his tray (9:227).

Gesell found that throwing at this age can be performed in a standing position but that it was still accomplished in an immature form. The release was not quite coordinated with the arm movement. Also, that the child tended to take steps both before and after the throw. It is not until a child is about four years of age that he acquires a definite stationary stance before the delivery is made. If the child is prevented from moving, he will face the direction in which he is going to throw the ball, then, with feet together, and with arm above or near the shoulder level, release the ball with a full, forward extension of the shoulder and elbow. His body remains fairly erect throughout, neither rotating nor twisting as the ball is thrown. Occasionally he might lean slightly forward at the hips. Exaggerated extension of the fingers and poor timing of the delivery causes the ball to be poorly directed.

In an experiment in which children were to throw a ball into a box, it was found that some threw it into the box while others dropped it in after going through the throwing motion. This act of putting the ball into the box rather than throwing it in was also covered in a study by Glassow, Halverson, and Harick (10). A 16-month-old boy, who had demonstrated the basic overarm movement preferred to carry the ball to the designated target instead of throwing it. Possibly this was due to the fact that he was still
not secure in his newly found skill and, since he wants to achieve, he performed the feat in the surest manner he knew.

Throwing at the age of two years, according to Gesell, can still be characterized as immature, with the act of walking occurring before and after the throwing of the object. There is only a slight body rotation as the ball is brought forward if the child is standing stiffly. There is improvement in the timing of the release but exaggerated finger extension still hinders the directioning of the ball. The arm is also still stiff with jerky movements (6:84-89).

Guttridge used subjective ratings to describe the throwing ability of children ranging in age from two to seven years (11:244). Trained observers were used to rate these children. She found none of the two- and three-year-old children were able to throw a ball well. In the four-year-olds, one child could be classified as skillful and twenty percent of the children were rated as proficient. Quite a jump was made in the five- to five-and-one-half-year-olds, where seventy-four percent were rated proficient. In the five-and-one-half- to six-year-olds, eighty-five percent were rated as throwing proficiently. Sixty-five percent of the six- to six-and-one-half-year-olds were rated as throwing proficiently. From this study, it was noted that there was a wide range in the abilities to throw a ball, from "extreme awkwardness" to "excellent."

A thorough study by Wild dealt with the development of throwing behavior between the ages of two to seven years (17:20-24). She analyzed the combination of movement patterns of the arms and body with cinematographic records. Her main objective was to find how
children use their bodies while throwing a ball in an overhand motion at progressive age levels. The boys and girls were carefully selected according to their age, at each six-month age level, between the ages of two to seven years. Selection was also made on the basis of their having achieved normal development in four important phases of child growth: Physical, mental, motor, and personality. All of the children had similar home and school environments and all were right-handed. The children were asked to do three overhand throws which were recorded on film and carefully analyzed.

Through the analysis of these films, Wild found movement and timing features of throwing which showed certain patterns related to certain ages. Also, at certain ages, there were combinations of patterns seen in the arm and body motions, and in the whole throw which seemed to be typical. She found four types of arm movements and five types of body movements which combined to make up six types of complete throwing movements, only four of which were clearly defined. Assignment of these four types to an age schedule was made, along with suggestions for a developmental sequence. According to Wild, stage one is—

"characterized by typical antero-posterior movements, of which there is preliminary incipient stage with no body movement. This stage can be assigned to ages two to three or possibly up to four and is described as follows: The reverse movement of the arm is either sideways-upward or forward-upward usually to high above shoulder, elbow much flexed. With this reverse arm movement, the trunk extends with dorsal flexion of ankles and carries the shoulders back. The trunk then straightens, carrying the shoulders forward, and flexes forward with plantar flexion
of the ankles as the arm swings forward over the shoulder and down in front. Elbow extension starts early. Movements of the body and arm are almost entirely in the anteroposterior plane over feet which remain in place; the body remains facing the direction of throw all the time; the arm is the initiating factor. There is trunk left rotation toward the end with arm's forward reach (17:20-24)."

Gesell was almost in full agreement with Wild in this statement, except he found that the child's weight remains almost entirely on the right foot throughout the throwing process whereas Wild said that both feet remain firmly in place (8:84-89). Both of these findings could be true—the weight could be placed more on one foot without moving the other, thus both feet would remain in the same place. Another point Gesell brought out was that the child still had little ability in directing the flight of the ball.

Wild describes the second stage by the statement that it—

"is marked by the introduction of body and arm movements in the horizontal plane, as contrasted to the anteroposterior plane, and is assigned to ages three and one-half to five years. The whole body rotates right, then left, above the feet; the feet remain together in place. The arm moves either in a high oblique plane above the shoulder or in a more horizontal plane, but with a forward downward follow-through. The elbow is much flexed; it may extend at once or later. The body changes its orientation and then re-orientates to the throwing direction. The arm is the initiating factor. (17:22)."

Again, Gesell's study was almost in full agreement (8:84-89). Gesell made a few additional observations not noted in Wild's study. He said there was an improvement in wrist-movement. The timing for the release of the ball had also improved, with the fingers used more for directing the ball's flight. Also, boys showed superior ability by the ease of delivery and accuracy. The horizontal plane which Wild mentioned in the movements of the body and arms
was not as characteristic in the act of throwing by girls as by boys. Girls tended to use a downward sweep. This difference might be explained in that Wild's study indicated the horizontal plane was present at this age but that not all the children necessarily threw the ball in such a manner. Wild did not mention differences attributable to sex until the last stage.

With reference to the third stage, Wild said:

"...it marks the introduction of stepping; it is the right foot-step-forward throw, assigned to age five to six. The weight is held back on the left rear foot as the spine rotates right and extends, the arm swings obliquely upward over the shoulder to a retracted position with elbow much flexed. The forward movements consist of a stepping forward with right foot, unilateral to the throwing arm, with spine left rotation, early turning of the whole body to a partial left, facing and trunk forward flexion, while the arm swings forward either in an oblique-above-the-shoulder plane or in a sideways-around-the-shoulder plane, followed by a forward downward movement of follow-through. Elbow extension does not start at once. This throw has both anteroposterior and horizontal features (17:22)."

Gesell again pointed up the sex differences which appear during this age period (8:34-39). The girls' stance is uncertain; with neither foot advances. Either foot may support the weight, the arm is brought over the shoulder behind the head, with the elbow high to the side and the trunk rotated and twisted to the right. The delivery is forward and downward, with weight shifting to the left foot or a step forward on the right foot, after which the ball is thrown almost entirely with the shoulder and wrist movement. The boys, however, threw as described by Wild in stage three. In Gesell's study, the girls had not really progressed much beyond the first stage described by Wild.
The fourth and last stage, described in Wild's study—

"is the left-foot-step-forward throw with trunk rotation and horizontal adduction of the arm in the forward swing. This throw is the mature form and all boys from six and one-half years up have it. The girls have, in most cases, attained the body and foot movements but incompletely developed forms of the arm movement. Others show decided regressions or retardations (17:22)."

Comparing boys' and girls' performances, Wild did find basic growth patterns for the age and sex to be different in the levels of proficiency. Gesell, et al, summarized the sex differences quite well in the following statement:

"Sex differences at five years and six years were clearly evidenced both in the throwing stance and in the actual delivery of the ball. Among the outstanding differences were the following: (1) Boys advanced the left foot only during delivery. (2) Boys held the ball at the right of the shoulder, while girls, in general, held it above the shoulder. (3) Boys utilized trunk and leg movements to greater advantage than did girls. Girls stood more erect in throwing than did boys. (4) Boys used the left arm to greater advantage in maintaining balance. (5) Boys shifted their weight more markedly than did girls. (6) Boys directed the course of the ball more accurately than did girls. On release, boys held the wrist and fingers in almost a straight line with the forearm, whereas girls flexed the wrist sharply so that the hand was brought down almost at a right angle with the forearm (3:84-89)."

In summary, there was almost full agreement among all the research studies as to the development of the overhand ball throw of the child in the first decade of life. By assembling these studies, a much fuller and detailed description was obtained. One disagreement was apparent in comparing Wild's studies with those of Gesell. Wild stated that, in the first stage, the feet remain in place during the throw whereas Gesell said the weight was mostly on the right foot. However, this could be possible,
inasmuch as weight may be shifted from one foot to the other without moving the feet.

Several conclusions may be drawn from these studies:

1. Throwing development begins to emerge in an immature form in the first year of life. This is primarily a response to maturation.
2. There are two main trends in the development in the sequential movement patterns of throwing stated by Wild, with which the other researchers are in agreement:
   a. "The gradual shift of movements from a predominantly anteroposterior plane to a horizontal plane; and
   b. "the transition from the use of an unchanging base of support to a shifting base on the same side as the throwing arm followed by the transference of weight in a much more stable and functional arm-foot opposition relationship (6:23)."
3. There are marked sex differences in pattern development of throwing which begin to appear at about the age of four favoring the boys. Thereafter, the girls lag behind the boys in about the second or third stage of pattern development. There is one possible reason for this—that boys have more opportunity to develop this skill.

Effects of Instruction on Throwing Abilities

Dusenberry, in his study, dealt with children from three- to seven-years-of-age (2:9-14). He used a control group and an experimental group, throwing for distance. Significant gains were revealed by the experimental group. The training consisted of six instructional periods in six weeks. It must be noted, however, that the control group also made progress in this period. The significant gains in skill shown by the experimental group was credited to the change in stance, resulting in greater torso rotation.
Studies have been made to determine the effects of training in specific skills on subsequent participation in games involving those skills. One study by Sparks, which dealt with first graders, indicated that the experimental group improved more than the control group after instruction was given, but it was felt that the gains were not significant (15).

Halverson conducted a study in which she tried to find methods for bringing a child from the beginning stages of throwing to the mature form (12:44). The project teachers identified specific movement problems, then provided experiences to develop these areas. The throwing patterns of the instructed group did reflect greater maturation than did those of the non-instructed group. Halverson concluded that the pre-school and elementary school child can develop more complex motor demands than were previously expected if they have been provided with the proper environmental stimulation and opportunity.

In summary, this writer noted that:

1. In all the studies, there were indications that more improvement was found in the trained groups than in the control groups, although both showed improvement.

2. In reviewing these studies, it appeared that most of the training periods were not very extensive. Some were given training once a week only. This led the author to believe that, if the training periods were held several times a week, the findings would favor the experimental groups to an even greater extent.
3. The findings further indicated that the rate of throwing increased along with the improvement in form.

4. It was concluded that possibly more time should be spent in training children at an early age, before habits become fixed, thereby making it more difficult to learn correct methods. It would appear that educators have, traditionally, underestimated a child's learning capability at early ages of development.

The Effectiveness of Audio-Visual Aids in Teaching

The United States Army and Navy both conducted exhaustive studies to determine the value of motion pictures as educational and training devices. These studies were the most complete investigative research projects found by this writer in the subject area. The results were stated as follows:

1. Good films can be used as the sole means for teaching some kinds of factual material and performance skills. Where the instructional situation makes this advisable, take advantage of this possibility.

2. Increased learning will result from film showings if the viewers are told "firmly" that they are expected to learn from the film and that they will be tested. Then, be certain they are tested on the content of the film.

3. Learning from film showings can be increased by repeated showings, pre-testing, or post-testing with knowledge of results given to the students.

4. Learning is also increased by introducing the film, stating the purpose and importance of the showing and how it is related to their training.

5. Ability to learn from films improves with practice in learning from films.

6. Trainees will learn more if printed study guides are used before and after viewing.

7. Note-taking should not be encouraged during the average film showing because it interferes with attention and, hence, with learning.

8. One showing of a film dealing with a complex skill may be insufficient. Show a film in the practice area so that the student can easily refer to the film model (such as, equipment demonstrated in the film) as often as necessary. This can be accomplished
by rear projection of film loops on daylight screens in the work area. Students should sit within twelve screen widths and within thirty degrees of the center line. Men can partially learn to do a skill by watching a film and imagining that they are performing the skill and by going through the skill "mentally," even though they do not have the equipment available. Films can provide a model for guided "mental" practice.

9. Film viewing sessions of informational material can extend to at least one hour without reduction in training effectiveness. (Some evidence from other studies contradicts this finding, especially for young children.)

10. Do not assume that learning has occurred as a result of showing a film. Evaluate the effect of a film by giving a test.

11. It is important for students to know ahead of the showing what special terminology or nomenclature must be learned.

12. The sound track often covers the important material to be learned in an informational film.

13. The more films seen in a study situation, the more he learns from other films.

14. If students should transfer their learning to a different but related situation, the operating principles should be explained in advance.

15. After testing students on film content, the correct answers should be explained. This can improve their learning (1:173).

Implications for Present Study

Through the related literature, the different stages of the development of the overhand ball throw were clearly defined. It was also disclosed that most boys develop throwing abilities by the age of six and one-half years, but many girls do not progress much beyond the second or third stage, and seldom to the fourth, or final, stage. Our culture has influenced this to some extent. Boys, generally, are more interested in playing ball than are girls, and therefore have the opportunity to develop the skill to a greater degree of proficiency.
All the research that was reviewed as to the effects of instruction on throwing abilities pointed up the fact that instructed groups improved more, and at a faster rate, than did those who were in control groups. It appeared, then, that instruction did aid in improving a child's ability to throw a ball.

Research concerning audio-visual aids revealed that films can be an effective device for teaching. Criteria based on sound research was included for the purpose of making a film an effective teaching device. If these criteria were followed, films can be good teaching tools.

In this study, an attempt was made to show how the teacher's ability to teach the overhand ball throw to students may be altered and enhanced. Tools offered were the inservice training film and instructional manual, both of which related to the development of throwing as described in the literature researched.
CHAPTER III

METHODOLOGY

The purpose of this study was to determine whether an inservice training film and instructional manual for teachers on the development of the mature form of the overhand throw can aid them in teaching this skill to children.

Preliminary Procedures

A pilot study was conducted a few weeks before the actual study was begun to determine the most appropriate angles to film children as they threw the ball, as well as to establish the reliability of the tester in analyzing the children's throwing proficiency. After studying films taken at angles of 45°, 90°, and a front view of a child in the act of throwing the ball, it was decided to use the 90° and front view positions. The angular shots were directed to the side of the body showing the throwing arm. The 45° angle shot was eliminated because it tended to distort the image of the actual movement of the child as he threw the ball.

To establish the reliability of the techniques of analyzing the act of throwing by use of a film of the subject's performance, a group of twenty primary grade students were rated as to their throwing ability by the investigator. Two weeks later, the same films were again rated by the investigator. The test-retest correlation coefficient was .99.

The length of the study was not determined by the pilot study inasmuch as the pilot study included only twenty subjects and the
teachers of one kindergarten class and one first grade class. The length of the study was determined by the findings in the related literature, none of which described projects that ran as long as this one, but all of which suggested that a longer study was advisable.

Also, the size of the ball to be used was not selected through the pilot study. A tennis ball was chosen because it was considered to be a better fit for the hands of the children at these ages than another size of a ball.

Subjects

The subjects for this study consisted of 140 boys and girls, pre-school, kindergarten, and first graders, ranging in age from four to seven, enrolled at the Rio Plaza, Rio Real, and El Rio Elementary Schools in the Rio School District, Oxnard, California. Six teachers, who were the students' regular classroom teachers, taught the children how to throw, using the mature overhand throw. The teachers assisted the students in completing a questionnaire (Appendix A).

This questionnaire was filled out by the students one week before the study began. It served to verify the assumption that the majority of the students were from similar socio-economic backgrounds.

The identification number assigned to the students was selected according to alphabetical listing in the roll call order of their class. The numbers were put on cards which were pinned by all four
corners to the front of the child's shirt or blouse. This process served to identify the child through the entire testing situation. The identification tags were about eight or nine inches square, having a black background with white six inch numerals, thus they were easily readable on the films.

Another questionnaire was devised and completed by the participating teachers, in order that this tester might gain information concerning them. These questionnaires were filled in at a meeting held on Tuesday before the project was begun. Pre-test schedules were arranged for the following Thursday and Friday. The experimental teachers attended another meeting in the district office on Friday, for the purpose of viewing the inservice training film and receiving their manuals. A sample of the questionnaire completed by the teachers appears in Appendix B.

**Experimental Design**

The study was conducted for twelve school days, twenty minutes per day. Each child was filmed while standing in a circle, four feet in diameter, marked by a white rope. The child threw a tennis ball into a golf net three times. The net, seven feet high and nine feet wide, was placed ten feet away from the circle for the preschoolers and fifteen feet away from the circle for the kindergarten and first grade students. The camera was positioned in a perpendicular manner so as to film the entire side of the child's body, showing the arm movement as he threw the ball.
The students were instructed by their teachers to go into the circle and throw the tennis ball, overhand, three times, at a target on the net. They were told to throw as well as they possibly could as soon as they had been given a signal by the photographer to throw the ball. The teachers also told the children that they would have an opportunity to "see themselves" on film in about two weeks. The teachers demonstrated the overhand throw with a motion of her arm. The students had identification tags attached to their clothing, these having been placed on each child before he left the classroom.

The target on the net was two feet, four inches long, and one foot, ten inches wide, with a black and white circle, one foot in diameter, in the center. The target was positioned in the middle of the net and was held in place by wire at all four corners. The target was twenty inches from the ground for the pre-schoolers and twenty-four inches for the kindergarten and first graders.

A copy of the instructions given to the teachers is found in Appendix C. On Friday before the research began, the teachers in the experimental group were shown the film on the development of the mature form of the overhand throw and were given the manual illustrating and explaining the stages of the development of the overhand throw.

On the first day of the project, the following notice was sent home with each student who was involved:
Dear Parents,

Your children are participating in a Motor Learning Research Project for the next two and one-half weeks. We would appreciate it if you would not let your children play with any ball during this time.

Your cooperation is greatly appreciated.

On the Monday following the meeting with the teachers of the experimental group, the students in this group were shown the film on the development of the mature overhand throw. This showing was repeated in six days. During the other ten school days allotted for the project, the teachers spent twenty minutes of each day instructing the children how to throw a tennis ball, using the mature form of the overhand throw. The control group teachers spent a like amount of time teaching the students how to throw a tennis ball in a mature form of the overhand throw, but neither the control group teachers nor the students were given any instructional aids.

Instrumentation

The experimental group used the film on the development of the overhand throw. One sound track was provided for the students and another for the teachers. Teachers in the experimental group also were given a manual which illustrated the development of the mature overhand throw. This manual was provided as a source of reference throughout the study (See Appendix D). A Super-8 Bell and Howell movie camera was used to film the children, both before and after
the twelve-day study, to analyze their throwing ability. A check sheet was devised and used by this investigator, to record and evaluate the filmed throws. This check sheet provided a record of the child's throwing ability in four stages of development. Movement and position of the arms, hand, wrist, body (rotation), legs, and stance were checked at each stage. A copy of the check sheet is included at Appendix E.

**Statistical Design**

A comparison analysis was made of each student before and after instruction, to determine his throwing ability. Data was compiled for each grade level in all the schools in the project. A t-test was used on the "improvement scores" to determine if any significant differences existed in mean gains between the experimental and control groups.

**Summary**

The research extended over a period of twelve school days, with a filmed account of the children, both before and after the project. The film was used as a basis for analyzing their throwing ability. A comparison, using student's t, was made to determine if significant differences in mean gains existed between the two groups. The following Chapter presents the results of this analysis.
CHAPTER IV

RESULTS

The problem considered in this study was to investigate the effects of training pre-school and elementary school teachers in the art of the overhand throw and their subsequent ability to teach this skill to students. Training was given the teachers by means of an inservice type of film, showing the development of the mature form of the overhand throw. A manual of instructions was also given to these teachers to be used as a reference during the study.

The purpose of this Chapter is to present an analysis of data pertinent to the study of this problem to determine:

1. The teacher's background, feelings, present class practices, and knowledge of physical education, and

2. Whether significant changes in the children's abilities to execute the overhand throw occurred during the project period.

Student's Questionnaire

A questionnaire was filled out by each student, with the assistance of the teacher, one week before the study began. This was done to verify the assumption that the students involved in the project were from similar socio-economic backgrounds.

Teacher's Questionnaire

All but one of the teachers in the project were veteran teachers (one was a first-year teacher). Only two of these teachers had even one course in elementary physical education. The others had none
and had little or no personal experience in sports activities. Each teacher, however, felt that physical education was an important part of the elementary school child's experience, but none felt qualified, both in knowledge and in class organization, to do a good job in this area. All indicated that a specialist in the field of physical education would be greatly welcomed, but, if a specialist were not available, all would welcome being provided with a simple tool and the necessary information and instruction to aid them in teaching motor skills and motor movements. The teachers felt that a workshop, offering such inservice training, would greatly enhance their abilities to teach children in these subject areas. The teachers freely admitted that the instruction in physical which they offered their students was quite limited, mainly because of their own basic insecurity. This does not in any way reflect on these individuals' teaching ability, for, according to Mr. Weber, District Superintendent, "These teachers are not teaching these grades by chance. It is the philosophy of the Rio School District that kindergarten and first grade are the most important grades in the child's educational experience. Therefore, we put our very best teachers in those positions."

Comparison of Mean Gains

A comparison was made to determine if significant differences in mean gains existed between the experimental and control groups based on pre-test and post-test scores at each of the grade levels tested as well as for all the subjects. The findings are set forth in the following tables:
### TABLE 1
COMPARISON OF MEAN GAINS FOR PRE-SCHOOLERS

<table>
<thead>
<tr>
<th>GROUP</th>
<th>N</th>
<th>M</th>
<th>RANGE</th>
<th>$\bar{m}$</th>
<th>$\sigma_m$</th>
<th>$\sigma_d$</th>
<th>$t$</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>12</td>
<td>+2.085</td>
<td>0 - 5</td>
<td>1.76</td>
<td>.53</td>
<td></td>
<td>1.38</td>
<td>Not at 5% level</td>
</tr>
<tr>
<td>with manual</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.356</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>15</td>
<td>+ .267</td>
<td>-10 - 5</td>
<td>4.55</td>
<td>1.29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>without manual</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### TABLE 2
COMPARISON OF MEAN GAINS FOR KINDERGARTENERS

<table>
<thead>
<tr>
<th>GROUP</th>
<th>N</th>
<th>M</th>
<th>RANGE</th>
<th>$\bar{m}$</th>
<th>$\sigma_m$</th>
<th>$\sigma_d$</th>
<th>$t$</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>25</td>
<td>+2.92</td>
<td>-7 - 14</td>
<td>4.29</td>
<td>.896</td>
<td></td>
<td>1.30</td>
<td>Sig. at % level</td>
</tr>
<tr>
<td>with manual</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.363</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>25</td>
<td>-.36</td>
<td>-10 - 8</td>
<td>4.547</td>
<td>.946</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>without manual</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 3
COMPARISON OF MEAN GAINS FOR FIRST GRADERS

<table>
<thead>
<tr>
<th>GROUP</th>
<th>N</th>
<th>M</th>
<th>RANGE</th>
<th>$\sigma$</th>
<th>$\sigma_M$</th>
<th>$\sigma_d$</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental with manual</td>
<td>29</td>
<td>+3.621</td>
<td>-5 - +9</td>
<td>3.528</td>
<td>6.669</td>
<td>1.23</td>
<td>3.456</td>
<td>Sig. at 1% level</td>
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<tr>
<td>Control without manual</td>
<td>27</td>
<td>- .63</td>
<td>-13 - +10</td>
<td>6.035</td>
<td>1.183</td>
<td></td>
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</table>

### TABLE 4
COMPARISON OF MEAN GAINS FOR ALL SUBJECTS

<table>
<thead>
<tr>
<th>GROUP</th>
<th>N</th>
<th>M</th>
<th>RANGE</th>
<th>$\sigma$</th>
<th>$\sigma_M$</th>
<th>$\sigma_d$</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental with manual</td>
<td>66</td>
<td>+2.742</td>
<td>-8 - +14</td>
<td>3.6</td>
<td>.448</td>
<td>.71</td>
<td>3.93</td>
<td>Sig. at 1% level</td>
</tr>
<tr>
<td>Control without manual</td>
<td>74</td>
<td>- .054</td>
<td>-13 - +10</td>
<td>4.707</td>
<td>.551</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Major Findings

The findings from these various treatments were as follows:

1. Since there was no significant mean gain improvement between the experimental and control pre-school classes, the null hypothesis is accepted.

2. Since the experimental kindergarten class showed significant mean improvement at the 1% level of confidence over the control group, the null hypothesis is rejected.

3. Since the experimental first grade showed significant mean gains of improvement over the control group at the 1% level of confidence, the null hypothesis is rejected.

4. Since all the experimental groups considered together showed a significant mean gain over the control group, at the 1% level of confidence, the null hypothesis is rejected.

The fifth and final Chapter will again summarize these findings and report the conclusions drawn from them.
CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this investigation was to determine the effect of training on the pre-school and elementary school teacher's ability to teach the overhand throw.

The project included 140 boys and girls, pre-school, kindergarten, and first graders, ranging in age from four to seven years, enrolled in the Rio School District of Oxnard, California. Six teachers were involved in the study. These teachers were regular classroom teachers in the pre-school, kindergarten, and first grades of Rio Plaza Elementary School, Rio Real Elementary School, and El Rio Elementary School. One kindergarten and one first grade from Rio Plaza, and one kindergarten and one first grade from Rio Real were used. The group from the Rio Plaza School was the experimental group, and those from the Rio Real School were the control group. There are only two pre-school classes in the school district. Both are at the El Rio Elementary School. One class was considered the experimental group and the other the control group. The study was conducted over a period of twelve school days.

The experimental group used the film and manual, while the control group were given no teaching aids. All of the children were filmed before and after the teaching period to determine their
throwing abilities. The $t$ test was used to determine any significant differences in mean gains made between the experimental group and control group in each grade, and for all the students in the experimental groups and control groups.

**Major Findings**

1. **Teacher's Questionnaire:** The teachers in the project did feel physical education was important to every elementary school child but they did not feel qualified in the knowledge and class organization to do the job well. As a result, they would welcome any help they can get, so long as it does not take away from their teaching of the subject matter in academic areas of instruction.

2. There was no significant improvement between the experimental or control pre-school classes at the 5% level of confidence, so the null hypothesis was accepted.

3. The experimental kindergarten classes showed significant improvement at the 5% level of confidence over the control kindergarten, so the null hypothesis was rejected.

4. Since the experimental first grade showed significant improvement at the 1% level of confidence over the control first grade, the null hypothesis was rejected.

5. All the experimental groups together showed significant mean gains over the control groups at the 1% level of confidence, thus requiring the author to reject the null hypothesis.

**Conclusions and Discussion**

Students in the experimental groups improved more than those in the control groups. In fact, there was some regression in the control groups at the kindergarten and first grade levels. This, possibly, was due to the fact that the teachers of the control groups stressed accuracy because they were not sure of the final form in the development of the mature overhand throw. Apparently
they believed that people who are accurate in throwing often have good form, consequently they had the students aim down their throwing arms. This brought their stance back to the first stage, with feet next to each other, and with the child facing the direction the ball was to be thrown. In so doing, interference with the arm movement resulted. It would appear that teaching without adequate knowledge can be harmful and may even cause regression, rather than improvement.

Greater improvement was noted with the older children. This, possibly, was due to better communication and understanding between the teacher and students, inasmuch as the older students are naturally better adjusted to a teaching/learning situation.

In conclusion, the use of the manual and film appears to have aided the elementary school teachers in this project in gaining knowledge of the development of the overhand throw, a prerequisite to teaching this skill to children in kindergarten and first grade. This researcher believes from these findings that other similar tools would aid elementary school teachers in their instruction of other motor skills and motor movements.

Recommendations for Future Studies

The teachers in the project felt the number of days of teaching in the research project were adequate but that they should be extended over a longer period of time. Possibly the teaching of the skill of ball throwing should be scheduled three times a week, rather than every day.
The teachers also felt that the film was helpful in that it served to coordinate the subject matter. They did question its usefulness for students, especially the pre-schoolers. They felt that the time taken to show the film to students might be better spent teaching throwing a ball outside in the field.

It was felt that the teaching tools would have been even more useful if they had been presented in a teachers' workshop. They felt that the material in the manual was good but that it took a disproportionate amount of time to read, taking time needed for other class preparation. Possibly this knowledge may be presented orally so questions may be answered as presented, rather than requiring teachers to read a manual. The manual could be used as a reference by the teachers in future instruction.

This researcher feels that this tool and similar tools could also be used in college classes, such as Physical Education in the Elementary School, to teach future elementary school teachers the knowledge of the development of the overhand ball throw. In that way, they would be better prepared to handle the job in the field.
BIBLIOGRAPHY
BIBLIOGRAPHY


APPENDIX A

STUDENT QUESTIONNAIRE
STUDENT QUESTIONNAIRE

(PLEASE WRITE OR PRINT YOUR ANSWERS TO THE QUESTIONS SO THEY MAY BE EASILY READ. USE YOUR VERY BEST PENMANSHIP!
PLEASE ANSWER THE QUESTIONS AS HONESTLY AS YOU CAN AND THE VERY BEST YOU CAN!)

NAME_________________________GRADE____AGE_____NUMBER____
(First) (Last)

TEACHER'S NAME_________________NAME OF YOUR SCHOOL________

How many brothers do you have?____How many sisters do you have?____What is your father's job?________________________

Does your mother have a job?____If so, what is it?____

Do you play baseball?____Do you bat a ball well?________

Would you like to learn to bat a ball better?________________

Can you throw a ball well?____Would you like to learn to throw a ball better?____Can you catch a ball well?________

Would you like to learn to catch a ball better?________
APPENDIX B

TEACHER QUESTIONNAIRE
TEACHER QUESTIONNAIRE

Name__________________________ Grade you teach__________________________

School________________________ Number of students________ Boys____ Girls____

How long have you been teaching?________________________ Have you ever had any course(s) in teaching physical education in the elementary school?____ If so, what were they and when were they taken?________________________

Do you have a yearly program in physical education?____ If so, what areas do you cover?________________________

Is the teaching of the motor skill of throwing part of your curriculum?____ Have you ever taught the motor skill of throwing?________________________

Do you feel there is a need to teach your students how to throw?____

Why?________________________

What time every day do you teach physical education?________________________

Do you feel physical education is an important part of the elementary school child's experiences?____ Why?________________________

Do you feel your college preparation adequately prepared you to teach physical education?____ Why?________________________

Would you welcome a specialist to aid you in this area?________________________

If a specialist were not available, would you welcome a simple, usable tool, with the necessary information, to aid you in your teaching of a motor skill movement of physical education?________________________

Have you had any experience in sports activities in school?________________________

When and where?________________________

Have you had any experience in a recreation program or similar program?____ When and where?________________________
APPENDIX C

TEACHER INSTRUCTIONS
TEACHER INSTRUCTIONS

I greatly appreciate all the time and effort you are putting into this project and would welcome any suggestions you may have to improve the film, manual, and the actual project at any time.

INSTRUCTIONAL PROCEDURES:

1. Number your children, according to their alphabetical standing in the roll call order of your class. These same numbers will be used both times the children are filmed (pre- and post-testing).

2. Pass out student questionnaires the day before the study begins. Have the children take home the parent letters the first day of the teaching, May 17, 1971. Please read the questionnaires out loud as the children fill them out. Return them to me when the children come out to the filming area.

3. Explain to the children their part or what they are going to be doing for the next twelve school days.

4. Pin the number (black and what material), which was assigned to them, from number one to the last number in your class, on the front of the children's clothing, all four corners to be pinned down.

5. Have the children line up according to their number, starting with number one.

6. Bring the children outside to the filming area.

Thursday, May 13, Rio Plaza and the pre-school children at El Rio will be filmed in the pre-test.
Friday, May 14, Rio Real will be filmed in the pre-test.
Any children missing their pre-test film will be filmed first thing Monday morning, May 17.

7. As the children finish the filming, please remove their numbers.

8. Teach the overhand ball throw with a tennis ball for twelve school days, everyday, during your physical education period, starting May 17, Monday, to June 2, Wednesday. Teachers at Rio Plaza Elementary School and one teacher from El Rio will use the manual and film Friday, at 3:20, in the district office, May 14. Their children will see the film Monday morning, May 17. The teachers at Rio Real Elementary School and one at El Rio School will use whatever aids and knowledge at their disposal.
APPENDIX D

INSTRUCTIONAL MANUAL
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<table>
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<tr>
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<th>Page</th>
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</thead>
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</tr>
<tr>
<td>WILD'S SECOND STAGE</td>
<td>6</td>
</tr>
<tr>
<td>WILD'S THIRD STAGE</td>
<td>9</td>
</tr>
<tr>
<td>WILD'S FOURTH STAGE</td>
<td>12</td>
</tr>
<tr>
<td>THE GRIP</td>
<td>17</td>
</tr>
<tr>
<td>TEACHING SUGGESTIONS</td>
<td>20</td>
</tr>
</tbody>
</table>
HOW TO USE THE MANUAL

The manual was devised as a teaching tool for pre-school and elementary school teachers to aid them in teaching the overhand throw. This section is written to assist the teacher in using this manual to its fullest. Teachers should read the page describing the stage of development and study most carefully the points to remember. After this, teachers should study and analyze the pictures and their captions. It would be well then to re-read the section outlining the points to be remembered. Try to gain enough knowledge of each stage so you will be able to recognize at which stage your students are in their development of the overhand ball throw.

The last section, entitled teaching suggestions, was put into the manual to help the teachers put their knowledge to use in teaching the overhand ball throw. Note, they are teaching suggestions only, meaning the teacher may or may not use them. Feel free to use any part or parts which are applicable to your program.
WILD'S FIRST STAGE

CHARACTERIZED BY BACKWARD AND FORWARD MOVEMENTS

Points to Remember:

The body and arm movements are almost completely in back and front.

1. Backward movements:
   a. The arm is brought up sideways, or up in front of the body, without bending the elbow, until the arm is above the shoulder. The arm is brought too high above the shoulder.
   b. The elbow becomes very bent once the arm reaches behind the shoulder.
   c. With the back arm movement, the body bends back.
   d. Neither foot is forward at the beginning of or during the throw.
   e. The hand, with the ball, at the end of the backward movement, is behind the head.
   f. The ankles bend at the onset of the throw which pushes the shoulders back.
   g. The hand is brought back at the wrist as far as possible.

2. Forward movements:
   a. The arm swings forward and upward over the shoulder, then straight down in front to the side of the body.
   b. The elbow straightens too early (in back of the shoulder).
   c. The shoulders come forward with the arm, causing the child to go up onto his toes.
   d. The hand at the wrist comes very far straight forward.
   e. The fingers are very straight at the end of the throw.

3. The body faces the direction of the flight of the ball throughout the throw.

4. The feet do not move, neither foot forward, throughout the throw.

5. The arm provides most of the force to send the ball through the air.
**Stage One**

**Backward Movement**

1. Neither foot is forward

2. The arm is brought up at the side without bending the elbow until it is above the shoulder, or (See #3)

3. The arm is brought upward in front of the body. The elbow is not bent until the arm is above the shoulder.

4. 

(Images 1 to 4 correspond to the stages described.)
The arm is brought too high above the shoulder. The ankles bend, causing the shoulders to be pushed back.

The hand at the wrist goes straight back.

With the back arm movement, the body bends back.

The elbow is extremely bent and the hand is behind the head.
STAGE ONE
FORWARD MOVEMENT

The body straightens, and The shoulders come forward.

The elbow straightens too early, in back of the shoulder.

The hand at the wrist comes straight forward.
The arm comes down in front and to the side of the body.

(5) Neither foot is forward
WILD'S SECOND STAGE

CHARACTERIZED BY THE BEGINNING OF THE BODY AND ARM MOVING IN A HORIZONTAL PLANE.

Points to Remember:

1. Backward movements:
   a. The arm is in a more horizontal plane as it is brought back, more to the side than up and down.
   b. The elbow bends sooner than in the First Stage (before the arm is behind the shoulder).
   c. The elbow becomes extremely bent at the back of this movement.
   d. The body turns toward the direction of the hand which is doing the throwing.
   e. Neither foot is forward.
   f. The hand with the ball is not nearly as far behind the head as in the First Stage.
   g. The wrist is brought straight back, behind the head.

2. Forward movements:
   a. The arm starts the movement forward, in somewhat a horizontal plane, then downward and forward, coming slightly across the front of the body.
   b. The elbow may straighten before it reaches the shoulder, or as it reaches the shoulder, which is still too soon.
   c. The body turns toward the direction the ball is to be thrown.
   d. The hand at the wrist comes straight forward.
   e. The fingers are very straight at the end of the throw, but they do begin to direct the flight of the ball somewhat.

3. The feet do not move, neither foot is forward at any time throughout the throw.
STAGE TWO
BACKWARD MOVEMENT

Neither foot is forward.

The elbow bends sooner than in the First Stage (before the arm is behind the shoulder).

The arm is in a more horizontal plane as it is brought back, more to the side than up or down.

The arm does not go above the shoulder.

The body turns in the direction of the hand doing the throwing.
STAGE TWO
FORWARD MOVEMENT

The hand at the wrist is still brought straight back. The elbow is still extremely bent but the hand is not as far behind the head as in Stage I.

STAGE TWO
BACKWARD MOVEMENT (Cont'd)

The arm starts the movement forward, somewhat in a horizontal plane, then downward and forward, slightly across front of body.

The elbow may straighten before it reaches the shoulder, or as it reaches the shoulder, which is still too soon.

The body turns toward the direction the ball is to be thrown.

Arm brought forward and downward slightly in front of body.

The wrist comes very far forward, fingers still very straight at the end.

Neither foot is forward.

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WILD'S THIRD STAGE

CHARACTERIZED BY THE INTRODUCTION OF STEPPING. STEPS FORWARD WITH FOOT ON SAME SIDE AS HAND THROWING THE BALL.

Points to Remember:

1. Backward Movements:
   a. The arm moves in an upward arc, back over the shoulder. At its full backward movement, it is slightly lower than the shoulder.
   b. The elbow is extremely bent.
   c. The body turns toward the hand which is throwing the ball. Body rotation at this stage is greater than at Stage 2. At end of backward rotation, the body straightens.
   d. Body weight is on left foot (or on opposite foot from the hand throwing the ball).
   e. Neither foot is forward.
   f. Throwing hand is brought straight back at the wrist.

2. Forward Movements:
   a. Throwing arm swings sideways, around the shoulder, then forward and down, across the body.
   b. Elbow straightens above the shoulder (still too soon).
   c. The body turns toward direction the ball is to be thrown, rotation continues beyond that point.
   d. Steps forward with foot on same side as hand throwing the ball.
   e. The hand at the wrist comes straight forward but not as soon as in Stages 1 and 2.
   f. The fingers are straight at the end of the throw. They do a better job directing the flight of the ball. Fingers grip better and timing of release of ball is improved.
BACKWARD MOVEMENT
STAGE THREE

(1) Neither foot is forward

(2) Throwing hand is brought straight back at wrist.
   Body turns toward hand throwing the ball. Body rotation is greater than at Stage 2. At end of rotation, the body straightens.

(3) Arm moves in upward arc, back over shoulder. In full backward movement, is slightly lower than shoulder.

(4) Elbow is extremely bent.

Body weight is on foot on opposite side to throwing hand.
FORWARD MOVEMENT
STAGE THREE

Elbow straightens above shoulder, still too soon.

Body turns toward direction ball is to be thrown, rotation continues beyond.

Hand at wrist comes straight forward.

Throwing arm swings sideways, around shoulder, then forward and down across body. The fingers are straight at end of throw. Do a better job directing flight of ball.

Fingers grip better and timing of release is improved.
CHARACTERIZED BY:  
A. THE LEFT FOOT FORWARD.  
B. THE BODY ROTATION.  
C. THE ARM MOVES HORIZONTALLY TOWARD THE BODY IN A FORWARD SWING.  
D. THE LEFT ARM IS OUT IN FRONT OF THE BODY FOR BALANCE IN THE BACKWARD MOVEMENT AND MOVES TO THE LEFT HORIZONTALLY IN THE FORWARD MOVEMENT.

Points to Remember:

1. Backward Movements (describes a right-hander):

   a. The weight of the body shifts to the right foot as the left side turns toward the direction the ball is to be thrown. This is called a pivot, the weight being on the right foot, primarily on the ball of the foot (just behind the toes and in front of the arch of the foot). The thrower bends his right knee and pushes with his left foot, as though pushing a scooter, while turning his body to the right until facing the direction the ball is to be thrown. The left foot is brought forward and down, with toes pointed slightly inward and left knee slightly bent. All thrower's weight is now on the entire right foot.

   b. Body rotates to the right and is somewhat inclined backward.

   c. The left hand is placed in front of the ball until the ball is started back and the left foot is being brought forward. The left arm is then brought forward in front of the body, toward the direction in which the ball is to be thrown. It reaches a position parallel to the ground at the same time the left foot is placed on the ground in front of the thrower (this is done for balance).

   d. The head, which remains in the same position throughout the throw, i.e. facing the direction the ball is to be thrown, does not turn with body rotation but eyes lock down left arm.

   e. The upper arm is moved parallel to the ground, just behind the shoulder while the forearm is at about a 30° angle at the elbow with the upper arm and is out in front of the body. When the upper arm starts to reach its farthest point behind the shoulder, the forearm comes up, maintaining the same angle at the elbow, and traveling the same distance behind the shoulder as the upper arm.

   f. The hand is in line with the forearm, palm down, until the forearm comes up at which time the hand is turned
at the wrist (rotating counter clockwise) and back, putting the palm of the hand at about a 45° angle.
g. The shoulder on the throwing arm side is in an inclined position, slightly back. The opposite shoulder is in an inclined position, upward and slightly forward.

2. Forward Movements:

a. The body rotation begins the motion forward to the left and upward, while the weight of the body is being shifted to the left foot as the knees straighten.
b. Forward motion of the shoulder on the throwing arm side starts slightly after the body rotation begins. It is upward and toward the direction the ball is to be thrown.
c. The upper arm moves forward horizontally, slightly behind the shoulder at the onset of the motion, then it snaps forward in front of the shoulder. The forearm stays a little behind the upper arm until the elbow has reached a position just in front of the shoulder, then the forearm snaps forward.
d. The hand and wrist stay in the same position (turning counter clockwise and back) until the forearm snaps forward, extending the elbow. Then the hand turns clockwise and snaps forward. The ball is directed by the fingers as they extend and release their grip in the direction of the flight of the ball following the snap of the wrist.
e. The left arm moves horizontally to the left side of the body as the ball enters its flight.

3. The shoulder, arm, wrist, hand, and fingers all extend in the direction of the flight of the ball in succession as described above.

4. The weight of the body is shifted to the right foot as it steps forward for the follow-through.
The left hand is placed in front of the ball until the ball is started back and the left foot is brought forward.

The weight is on the right foot as the left side turns toward the direction the ball is to be thrown.

The body rotates to the right and is in an inclined position.

The right forearm is at about a 30° angle with the upper arm and out in front of the body until the upper arm reaches its farthest point behind the shoulder.
The left arm is brought forward in front of the body toward the direction the ball is to be thrown.

The hand is turned at the wrist, counter-clockwise and back. The right shoulder is back. The upper arm is moved parallel to the ground, behind the shoulder. The forearm, at the elbow, is at about a 30° angle with the upper arm and travels the same distance back of the shoulder as the upper arm.

The left arm reaches a position parallel to the ground at the same time the left foot is placed on the ground in front of the thrower.

The forearm stays a little behind the upper arm until the elbow is just in front of the shoulder.

As the body rotates, the weight of the body is shifted to the left foot and the knees straighten.

The body rotation begins with the motion forward.
FORWARD MOVEMENT
STAGE FOUR (Cont'd)

The hand and wrist stay in the same position until the forearm snaps forward, extending the elbow. Then, the hand turns clockwise and snaps forward.

The left arm moves horizontally to the left side of the body as the ball enters its flight. The right arm comes across the body in the follow-through.
THE GRIP

The development of the mature grip was not associated with any of Wild's Stages of development of the overhand throw in this manual due to the fact that many children do grip a ball in a mature manner in all the stages. If an immature grip is to be found, it is usually in Wild's first stage. This is not to say the immature grip cannot be found in any of the other stages, but, generally speaking, it is limited to the first stage.

THE IMMATURE GRIP

Points to Remember:

1. All the fingers are grouped together on top of the ball throughout the throw.

2. As the grip matures, the fingers spread around the ball.

THE MATURE GRIP

Points to Remember:

1. The grip remains the same from the time the ball is first picked up until it is released.

2. The thumb is placed on the side of the ball closest the body toward the bottom of the ball.

3. The little finger is placed under the ball on the side away from the body with the inside of the finger next to the ball.

4. The index finger and the middle finger on the hand are placed over the top of the ball.

5. The ring finger is to the outside of the ball near the top.

6. The ball never comes to rest in the palm of the hand.
THE IMMATURE GRIP

All the fingers are grouped together on top of the ball throughout the throw.

As the grip matures, the fingers spread around the ball.
The thumb is placed on the side of the ball closest to the body toward the bottom of the ball.

The little finger is placed under the ball on the side away from the body with the inside of the finger next to the ball.

The index finger and the middle finger are placed over the top of the ball. The ring finger is to the outside of the ball near the top. The ball never rests in the palm of the hand.
TEACHING SUGGESTIONS

Thought Questions

These questions were developed for two reasons: (1) To bring the children's attention to, or to make them aware of, what the different parts of their bodies are doing when they are throwing a ball, and (2) for the teacher's use in leading her students in areas of instruction for daily lessons. One or more questions may be asked each day, depending on the ability of the students, and the difficulty of the task. The questions were arranged in some form of progressive order, but may be changed about at the discretion of the teacher.

1. What is an overhand ball throw?
   Ans: Hand above elbow.

2. How do you hold a ball?
   Ans: Spread fingers; never let it touch the palm of the hand; the fingers do the holding.

3. What do the feet do when the ball is being thrown?
   The knees?
   Ans: The foot on the same side as the hand which is throwing the ball is back and the other is forward.
   The knees are slightly bent.

4. Where is the weight of the body?
   Ans: On the back foot during the backward movement of the throw, changing to the front foot in the forward movement.

5. What does the trunk of the body do when you throw a ball?
   Ans: Turns away from the direction the ball is to be thrown on the backward movement and toward the direction the ball is to go on the forward movement.
6. What does the head do when the ball is being thrown?
   Ans: At all times, the head is turned in the direction the ball is to be thrown.

7. What do the shoulders do when the ball is being thrown?
   Ans: The shoulder on the side of the throwing arm is inclined backward and the opposite shoulder is inclined forward and upward on the backward movement. The shoulder on the side of the throwing arm in the forward movement starts slightly after the body rotation is commenced.

8. What does the arm do that is throwing the ball?
   Ans: The upper arm is moved parallel to the ground to a point just behind the shoulder. When the upper arm reaches its farthest point behind the shoulder, the forearm comes up, maintaining the same angle at the elbow, traveling the same distance back from the shoulder as the upper arm. The upper arm moves forward horizontally, slightly behind the shoulder at the onset of the forward motion, then it snaps forward in front of the shoulder. The forearm stays a little behind the upper arm until the elbow is just in front of the shoulder, then it snaps forward.

9. What does the arm do that is not throwing the ball?
   Ans: The left hand is placed in the front of the ball until the ball is started back and the left foot is brought forward. The left arm is then brought forward in front of the body in the direction the ball is to be thrown. It reaches a position parallel to the ground at the same time the left foot is placed on the ground. In the forward movement, the left arm moves horizontally to the left side of the body as the ball enters its flight.

10. What does the hand and wrist do when the ball is being thrown?
    Ans: In the backward movement, the hand is turned at the wrist (counter-clockwise) and back. In the forward movement, the hand turns at the wrist (clockwise) and snaps forward after the forearm snaps forward.
ACTION QUESTIONS

These questions were developed to be used at times when the children actually have balls and can practice throwing. They are representative of the many questions a teacher could ask a class as a whole or an individual student as she passes from child to child.

For increasing range of motion and speed:

1. How far can you throw the ball?
2. Can you throw the ball this far (20 feet)?
3. Can you hit this object (a target)?
4. Can you throw the ball hard?

The grip:

1. When you pick up the ball, can you see the palm of your hand?
2. Can you put your thumb and little finger at the bottom of the ball?
3. Can your fingers hold the ball?

The head:

1. Can you look at your target all the time?

Weight of the body:

1. Can you put the weight of your body on your back foot when you are bringing your arm back to throw?
2. Can you change the weight to your front foot as you throw the ball?

The arm:

1. Can you bring your upper arm out more to the side (horizontal) rather than right up next to your ear?
GAMES

1. SNAP

   a. Find a long line. Have all the students line up, with the teacher in front (right handers with their left side to the teacher and their left foot on the side of the line closest to the teacher).
   b. Keep both feet on the ground.
   c. Turn away from the forward foot until they can see some object which the teacher directs them to look at behind or to the side of them.
   d. At the word "Snap," students turn back as fast as they can, without moving their feet.

2. PROGRESSIONS:

   a. Bring arms up.
   b. Always look where ball is being thrown.
   c. Bend knees.
   d. Lead with the hips on the snap forward.
   e. Throwing arm movement.
   f. Body and shoulder lean-back.
   g. Opposite arm movement in front of the body for balance.
   h. Hand and wrist movements.

   Movements can be started without a ball, then, after the movements become fairly smooth, the ball can be added.
BIBLIOGRAPHY
(for Instruction Manual)


APPENDIX E
CHECK SHEET
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<td>2-shoulders rotate back and up</td>
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<td>3-level back and then down</td>
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<td>after arm gets to shoulder</td>
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<td>4-shoulder lowered at the onset</td>
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<td>Shoulder forward</td>
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<td>1-With the arm, up and down</td>
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<td>2-forward, up and down</td>
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<td>3-forward, across and down</td>
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<td>4-across</td>
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<td>Non-throwing arm</td>
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<td>1,2,3-arm is not up, at side</td>
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<td>4-up in front of the body and then to side parallel to the ground</td>
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