THE EFFECTS OF THREE CONDITIONS INVOLVING ACTIVE OR PASSIVE OBSERVERS UPON PERFORMANCE OF COLLEGE FEMALES ON A VOLLEYBALL OVERHAND SERVE TEST

THESIS

Presented to the Graduate Council of the North Texas State University in Partial Fulfillment of the Requirements

For the Degree of

MASTER OF SCIENCE

By

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The purposes of the study were to determine if college females perform best on the AAHPER Volleyball Serve Test with classmates passively or actively observing, or instructor only actively observing, and to determine which condition was best for high, medium, and low skilled beginners.

Subjects were sixty-three college females. Data were analyzed by a two-way analysis of variance with repeated measures. Conclusions of the investigation were beginners perform better with active than passive observers present; highly skilled beginners perform better with active observers than instructor only present; medium skilled beginners perform better with active observers and instructor only than passive observers present; and low skilled beginners showed no significant difference between conditions. $\cap.C.$
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CHAPTER I

INTRODUCTION

In the field of education evaluation has been considered of primary importance to administrators, teachers, and students. Baumgartner and Jackson (3) stated that "measurement and evaluation are integral components of the educational process" (p. 13). "Evaluation is not only a means of determining whether achievement is acceptable, but also a means of facilitating learning" (p. 16).

Safrit (7) suggests that evaluation serves many purposes, one of which is to classify a student's ability. One way to classify a student's ability is through testing. Baumgartner and Jackson (3) agree that tests are a necessary part of evaluation in most physical education classes. Tests may be used for placement, diagnosis, evaluation of learning, program evaluation, and motivation. Evaluation of student achievement "is an extremely important part of the instructional process" (p. 315). Clarke (4) purports that while testing will never replace teaching, it aids in the learning process and may insure and hasten student's growth as a highly effective teaching device.

Skill testing leads to the evaluation of a student's psychomotor abilities. Clarke (4) stated that the learning of desirable skills is the foundation of physical education
"to evaluate status and progress in the acquisition of skills is an important phase of measurement in physical education" (p. 300). He contends that the fundamental function of physical educators is to "understand each child's needs in order to give him adequate guidance and to adapt programs to meet his needs" (p. 3). Barrow and McGee (2) agree that evaluation becomes a technique for judging how effective an educational experience has been for an individual.

In many schools, colleges, and universities, skill testing makes up a major portion of the evaluation process in physical education courses, the results of which are often the basis for a percentage of a student's final grade. It is for this reason that most students consider skill tests to be extremely important in nature.

When the time arrives for a test to be administered, each student reacts in his individual way. Some students may become nervous or depressed, while others may be calm or unworried. Since each student is considered to be unique, the principle of providing for individual differences must become a reality in education according to Clarke (4). He further contends that in order to provide for individual differences the exact needs of the student must be established and this can be accomplished through measurement and evaluation. Alcorn, Kinder, and Schunert (1) conclude that providing for individual needs and differences is the stimulating challenge of present day teaching.
Therefore, since testing appears to be generally accepted in the educational process, teachers should make a concentrated effort to provide the best possible environment for test administration. Barrow and McGee (2) stated that instructors should be reluctant to use a test which will have negative aftereffects on his students, such as tests that are too difficult. It would also seem that instructors should be hesitant to test under conditions which might have negative aftereffects, such as testing individuals in front of many observant classmates. Many times when test day comes instructors have heard students comment that it makes them uncomfortable to perform while everyone is watching. Some students consistently ask if they may be the last to be tested hoping that time will run out and their classmates will be busy collecting equipment or going to the dressing room and attention will not be focused on them. Some students may become excessively nervous, worried, or upset, when called upon to perform with many classmates watching which may result in performance below their actual level of ability. If this occurs, test scores would therefore be lower and the test grade assigned to the student might not be representative of their actual ability. The instructor therefore, should consider altering future testing situations for certain groups of students.

In many skills testing situations however, there may be a necessity for observers to be present, whether observing
while awaiting a turn or helping with test administration and scoring. The number of observers in such instances may vary from a few to one-half of the class or more. Often-times, it appears to be taken for granted that skill tests will be given in groups and therefore many observers will be present.

Perhaps this commonly used skill test environment is not the best for all students if each student is unique in his own right and may not perform the same as other students under the same conditions. Cratty (6) stated that observers can change performance output of an individual who is performing. Therefore, perhaps some students need a different environmental condition when being tested to enable them to put forth their best effort. Individual testing may be the best environmental condition for some students even though it may be time consuming, whereas group testing may be best for other students. According to Singer (9) the more highly skilled performer will show an increment in performance, whereas the lower skilled performers will show a decrement in performance with an audience present. Therefore, it is possible that a student's skill level may be a factor in the determination of testing conditions.

It would seem desirable to examine this problem in a real classroom setting as opposed to a laboratory setting.
Singer (10) stated:

In most experimentation in motor learning the subject is removed from reality; that is, the setting and the task are usually contrived and artificial. . . . Valid behavioral information appears when consistency in observations occurs not only in isolated circumstances but in social settings as well (p. 377).

He concluded that activity pursuits and proficiency attained in "real-life" tasks are to some degree dependent upon factors such as peer and culture influence, cooperative as well as competitive ventures, and social interactions.

In view of the above concerns, there is a need to examine the situation of skills testing and the conditions under which these tests are administered. Of equal importance is the examination of this situation in an actual classroom setting rather than in a laboratory setting. It is hoped that the results of this investigation will provide teachers, potential teachers, and administrators with information concerning the type of environment that will allow the student to perform at his optimum level.

Statement of the Problem

This study was designed to determine if female beginning volleyball students at North Texas State University could better perform the overhand serve in one of three treatment conditions involving active or passive observers. The study further sought to determine if one of the three treatment conditions involving active or passive observers
was superior for students ranking in the higher, middle, or lower one-third of their class in overhand serving ability.

Purposes of the Study

The purposes of the study were

1. To determine if female beginning volleyball students at North Texas State University perform best on the AAHPER Volleyball Serve Test with only the instructor actively observing and recording performance;

2. To determine if female beginning volleyball students at North Texas State University perform best on the AAHPER Volleyball Serve Test with several classmates passively observing performance and the instructor observing and recording performance;

3. To determine if female beginning volleyball students at North Texas State University perform best on the AAHPER Volleyball Serve Test with the instructor and several classmates actively involved in duties associated with administering the skills test such as recording and ball retrieving, and not intently watching the total performance;

4. To determine which of the three conditions was best for performance of those female beginning volleyball students at North Texas State University ranking in the higher, middle, and lower one-third of their class in overhand serving ability;

5. To examine the interaction effect of skill level and treatment conditions.
Definition of Terms

The following terms and definitions were pertinent to this study

Theoretical:
1. **Skill Test.**—"Designed to measure a student's ability to perform selected skills in controlled situations" (1, p. 426);

2. **Overhand Serve.**—"Performed in volleyball with an overhand throwing action" (8, p. 283);

3. **Passive Observers.**—"Those who are physically present and who neither support nor evidence hostile feelings about the performance viewed" (6, p. 20).

Operational:
1. **Skill Test.**—A measurement device used to determine a student's ability to perform a sports skill such as the overhand serve in volleyball;

2. **Overhand Serve.**—Putting the ball in play in volleyball from behind the baseline by first tossing the ball then contacting the ball with a fist or open hand using the overhand throwing motion;

3. **Passive Observers.**—Classmates who are observing a performance by another classmate and have been asked not to make any encouraging or discouraging remarks to or about the student being tested;

4. **Actively Involved Observers.**—Classmates and instructor who are involved in duties associated with the
administration of a skill test, such as recording, ball retrieving, etc., and are not intently watching the student performing the test.

Delimitations of the Study

This study was delimited to female beginning volleyball students performing in three selected treatment conditions. Furthermore, the American Alliance for Health, Physical Education, and Recreation Volleyball Serve Test was used in all testing.

Limitations of the Study

This study was limited in that the subjects were selected from the three womens' beginning volleyball classes at North Texas State University, Denton, Texas, in the fall semester 1977. Furthermore, two of the classes regularly met for one hour three times per week, while the third class regularly met for one and one-half hours two times per week.

Summary

A major concern of physical educators is the skill development of their students. The skill test is a popular method of determining the level of that development. The present investigation is an attempt to determine which of three selected treatment conditions is the best environment for administering skills tests to students and which is best for students of high, medium, and low skill ability.
CHAPTER BIBLIOGRAPHY


CHAPTER II

REVIEW OF LITERATURE

An extensive review of related literature revealed a limited number of experimental studies directly related to the effect of classmate observance upon performance of required skill tests. The literature reviewed in this section was selected because of its relationship to the importance of evaluation and skill testing in physical education. It also includes pertinent information on the overhand serve in volleyball, the theory of social facilitation, evaluation apprehension, and coaction and audience effects on performance.

Evaluation and Skill Testing

Safrit (34) defined evaluation as "the process of making judgments about the results of measurement in terms of the course objectives" (p. 1). Barrow and McGee (3) stated that in the final analysis evaluation becomes a technique for judging how effective the educational experience has been for the individual. In order to evaluate a student's abilities a measurement device may be used to obtain raw data for assimilation of results. One such measurement device in the area of physical education is the skill test. Scott and French (36) stated that skill development is widely recognized as one of the major objectives in physical education.
and that measuring sport skills is an important aspect of the teaching procedure. Clarke (10) recognized the importance of skill testing in physical education and stated that it accomplishes three major purposes. These purposes include evaluating the progress of each student, classifying students according to levels of ability, and establishing minimum standards in activities where achievement levels may be established in terms of skill test scores.

Safrit (34) stated that one of the most common reasons for evaluation of students achievement in motor skills is as a basis for grading. In physical education classes this area (motor skills) often receives great emphasis when grading. Scott and French (36) add that it is helpful to know the status of a student at the end of a unit. In most schools a teacher is expected to give a grade. "Grading is basically a process of rewarding a student according to his learning relative to the learning of other students, and relative to a subjective standard established by the teacher" (p. 2).

One method of administering skill tests is in groups. According to Barrow and McGee (3), testing in a school situation is a group experience. It is not often appropriate or feasible to administer tests in "solo fashion". They contend that some factors which are present during skill test administration are, groupings, waiting turns, helping score and administer the test, and cooperation with classmates and the teacher. Whether "groupings" meant other groups waiting to
take the test was not indicated. Alcorn, Kinder, and Schunert (2) have concluded that other learning activities must be planned for students not taking the test when only part of the class can be tested at one time.

Knapp and Leonhard (25) however, have stated that teacher administration of tests to individual students is likely to produce greater accuracy of results than does the group method. Although this method is appropriate for clinical and research and laboratory testing, wide use of it is impractical in most school situations because of the time required. They further postulate that in most programs, individual administration by teachers is most useful in re-checks of questionable cases and in make-ups for students who may have been absent or unable to take the test at the time of group tests.

AAHPER Sports Skills Tests

According to Shay (37), the editor of the American Alliance of Health, Physical Education, and Recreation Skills Test Manual, one of the greatest problems that has confronted the physical education profession is that of providing teachers with dependable and reliable instruments for evaluating physical activity. He charged that during recent years other disciplines have been developing standardized tests while physical educators have not made a great deal of progress in the area of measurement and evaluation.
The first program of its kind was undertaken by the AAHPER in the late 1950's in the area of physical fitness. In 1959, a project was initiated to develop standardized tests for various sports activities. The initial phase of the project established tests and norms for the most common sports in school programs of physical education.

The ultimate purpose of the AAHPER Sports Skills Tests is to "encourage all boys and girls to participate in team and individual sports and to provide a way in which they may appraise their skills relative to norms for boys and girls of the same age" (p. 8). The purpose of the AAHPER Volleyball Serve Test is "to measure the player's skills in serving as in an actual game" (p. 21).

Overhand Serve in Volleyball

Slaymaker and Brown (43) stated that "power volleyball" was a term coined in recent years to describe a type of volleyball played at a more highly competitive level than the usual recreational game. Each point must begin with a serve from behind the baseline. In power volleyball, this serve is usually a forcefully hit overhand type of floater serve. The manner of the ball in flight makes it difficult to return. In addition, they state that instructors and students alike are aware of the futility and loss of time in a game in which there are numerous serving errors. It, therefore, seems very necessary to teach and test for good serving ability.
According to Bluth (6) "the only measure of the effectiveness of a serve is whether it contributes to scoring a point" (p. 9). In discussing the serve, it is stated that an effective serve is a combination of power and accuracy with techniques varying from player to player. In comparing the overhand serve with the underhand serve, he stated that too many players sacrifice a good underhand serve for the status of the overhand serve, which for them may not be effective. On the other hand, he stated that the overhand floater serve does not depend on maximum power for effectiveness; therefore, it is a good serve for younger, smaller, or weaker players.

The overhand serve can easily be taught to beginners and even the most inexperienced players can be easily taught to accurately place this serve within the volleyball court. Egstrom and Schaafsma (18) concur with other authorities, that the serve is a very important aspect of the game of volleyball. They contend that the overhand floater serve is used by most players because it puts the opponents on the defensive. The underhand serve may be a more consistent method but does not have the effect of the overhand serve, because it is easy to receive and set up a power play.

Schaafsma and Heck (35) concluded that although it is possible to serve the ball underhand with considerable accuracy, the trajectory and lack of force of this technique make it a defensive serve for all but the beginning level of skill, or until players are able to pass the ball accurately when it travels in a downward path.
Social Facilitation

Social facilitation, narrowly defined by Martens (28), refers to an increment or decrement in performance due to a spectator effect. Spectators may be classified into groups as to effect, such as audience effect which is behavioral effects from passive spectators, or coaction effects which is others doing the same thing at the same time but independently.

Zajonc (47) stated in his theory of social facilitation that the presence of others enhances the emission of dominant responses by increasing the general drive level of individuals. He theorized that it is important to distinguish between learning and performance. Learning is basically the acquisition of new responses whereas performance is the emission of old (well learned) responses. He contended that the presence of spectators is a source of drive arousal and therefore facilitates performance on well learned tasks, but hinders performance on poorly learned tasks. Also, spectators may impair the acquisition of new responses.

Cratty (14) stated that individuals observing performance can change the output of the individual who is performing, but the type of change is not indicated. Davis (17) suggested that performers may do better or worse when an audience is present, but it is unlikely that they will be indifferent to the presence of others. In other words, some type of effect or change will occur even if very slight. Singer (38) stated that some performances are impaired by
presence of spectators, others are improved, and still others may not be affected at all. He contends that in general, the more highly skilled performer will show an increment in performance, whereas, the lower skilled performer will show a decrement in performance in the presence of spectators.

Singer (42) presented two categories for task performance and the effect spectators should have on persons performing these tasks. One category involves simple tasks, demanding physical energy, repetition, power, strength, or endurance. These tasks are probably benefited by the presence of spectators. The second category involves complex tasks, which require coordination, fine movements, and intense concentration. Presence of spectators may impair performance until these tasks become thoroughly familiar to the subject.

Evaluation Apprehension

Several authorities have conducted studies to determine whether or not social facilitation or evaluation apprehension is the actual source of the so called "social facilitation" phenomenon. Martens (28) charged that Zajonc's theory of social facilitation is perhaps an oversimplification of the matter of the mere presence of others arousing a performer and causing the emission of dominant responses thus increasing performance. Cottrell, as cited in Simmel, Hoppe, and Milton (11), stated that perceived potential for evaluation by others leads us to anticipate positive or negative outcomes in performance.
Cottrell et al. (12) conducted a study in which one group of fifteen subjects learned alone; one group of fifteen subjects with two people comprising the audience; and one group of fifteen subjects with two blindfolded people comprising the audience. The task was a recognition and pseudorecognition task involving nonsense words. The results revealed that the group that performed with two blindfolded people in the room obtained the same results as the alone group. It was summarized that the presence of others who could not evaluate the individual's performance (blindfolded persons or mere presence of others) did not produce the social facilitation phenomenon.

Coaction and Evaluation Apprehension

Singer (42) stated that the effects of coaction appear to be dependent upon the subject's awareness that he is to be evaluated in some way. Klinger (24) and Henchy and Glass (22) agreed that the potential for evaluation is a necessary condition for social facilitation effects. In both studies, it was found that the presence of a coacter or coacters who could not evaluate the other subjects' performance did not significantly improve scores.

In a study conducted by Martens and Landers (30), it was shown that increasing number of coacters resulted in increased impairment of performance in the game of "roll-up." Subjects performed alone, in dyads, triads, and tetrads and three levels of evaluation potential were created; the normal
coaction situation (direct evaluation), the removal of visual cues but knowledge of others' performance outcome (indirect evaluation), and no potential for evaluation (no evaluation). Results supported the hypothesis that increasing coacters results in increasing impairment of motor performance. Furthermore, the results supported the hypothesis that evaluation rather than the mere presence of others is the source of the social facilitation phenomenon.

The findings in Martens and Lander's study were replicated by Burwitz and Newell (7). The "roll up" game was used with the same four coaction situations. It was shown that performance in triads and tetrads was significantly inferior to that of subjects performing the "roll up" task alone or in dyads.

Carment and Latchford (8) indicated that evidence shows that coaction effects occur only when the coacters perceive that their performance is under observation and is being evaluated. They conducted a study which was designed to assess the effects of the presence or absence of the experimenter on the rate of responding of forty-eight males and forty-eight females in coacting and alone situations. The task consisted of moving a lever (self-centering toggle which was mounted on a panel) back and forth for a period of ten minutes with a three minute rest period after five minutes. Based upon the results of the study it was concluded that coacting subjects with the experimenter present respond more
rapidly than subjects in experimenter absent groups. In addition, not only does the rate of responding decline when the experimenter is absent, but the coaction effects disappear as well. This may be caused by the fact that no information was made available to the subjects as to how well they were performing, therefore, a coacter was not perceived as an evaluator.

Coaction Effects

Martens and Landers (29) conducted a study to determine the effects of coaction on muscular endurance. Boys of three different age groups were used to perform a task which consisted of extending one leg horizontally while sitting down and holding the leg in that position for as long as possible. One-third of the subjects within each age group did the task alone, another third in pairs, and another third in fours. This study was not designed to include evaluation potential as was a previous study by Martens and Landers (30). The results revealed that the subjects in the groups of four were able to hold their legs in the extended position significantly longer than the pairs or the alone groups in all three age groups.

Abel (1) found that on a paper and pencil maze test subjects performed better in groups than when alone. The subjects for the study were thirty-eight girls with IQ scores of fifty to fifty-nine and thirty-six girls with IQ scores of seventy to seventy-nine. The subjects were also tested
on performance tests in addition to written IQ tests and it was determined that the group with the lowest IQ's had mental ages under thirteen and the group with the higher IQ's had mental ages above thirteen. The chronological age of all the subjects was fifteen or sixteen and both groups were equivalent in social and economic backgrounds. She concluded that the more intelligent subjects profit most from social facilitation since scores on the maze test were higher for the high group than for the low group when working with others.

Burwitz and Newell (7) found that when subjects were required to perform a novel motor skill ("roll up") an increase in the number of coacters resulted in impairment during initial learning and during performance. Subjects that performed alone or in pairs were significantly superior to those who were in groups of three or four. These findings support those of an earlier study done by Martens and Landers (30) under the same conditions.

Bird (5) conducted an investigation to test the effects of the presence of an audience as compared to a coaction setting during performance of two different psychomotor tasks. The first task used the steadiness tester-hole apparatus in which subjects placed a stylus in each of four marked holes and attempted to hold the stylus as still as possible so as not to touch the sides of the holes. The second task involved the use of the Minnesota Rate of Manipulation Turning Test which required subjects to turn and place as many of sixty
cylindrical blocks as possible within the designated thirty second time period. Ninety female subjects were randomly assigned to each of three treatment conditions: alone; audience with two passive spectators in view of the performer and standing on marks placed on the floor; and coaction with observers seated at a table and in full view of each other but with the restriction of no talking or comparing scores so there would be no competition. All subjects took three trials on the tasks of hand-steadiness and manual dexterity. The results showed some support for the hypothesis that the effects of an audience and coaction group setting are not identical. The coaction group performed significantly better than the audience group on both tasks. However, there was no significant difference between the coaction and the alone group on the task of hand-steadiness, nor between the alone and audience group on either task. Bird concluded that the findings of the study strongly suggested that the two paradigms of audience and coaction cannot be viewed as having identical social effects.

In an experiment by Dashiell (16) it was found that an improvement in performance occurred because of the presence of others, but the improvement was in speed at the expense of accuracy. Tasks included multiplication of two-place by two-place numbers, analogies, and free serial word-associations. Subjects performed the tasks alone, in front of passive spectators, together with simple coactors, and together with
competing coacters, without stressing the competitiveness of the situation. When performing alone subjects were put in separate cubicles and when working in groups subjects sat around a common table.

Audience Effects

Fisher (19) defined the types of audience as the "mere presence of other individuals who remain silent and offer no direct feedback (just physically present)" and an audience that "actively relates to the performer and may be either supportive or threatening" (pp. 4-5). In the latter case, it is assumed that the audience has some knowledge of the activity.

One of the earliest studies in the area of social psychology was conducted by Triplett (45). Forty subjects were used in the study and were tested alone and in a competitive situation with others present. The tasks were winding a fishing reel and riding a bicycle. Results revealed that twenty subjects did better when in a competitive situation, ten did worse, and ten did the same in the competitive and alone situations. Triplett concluded that the presence of spectators seemed to liberate latent energy and stimulate the performer to greater effort.

In a study conducted by Travis (44), subjects were instructed to hold a flexible pointer on a revolving disc containing a target (pursuit rotor) as long as possible. Practice was carried out in the "alone" situation, except
for the presence of the experimenter, for several days until the task was well learned. Then, after a warm-up period, each subject was required to perform in front of a passive audience that varied in size from four to eight persons. Although most subjects were judged to demonstrate distress to some degree or other, more than 81.1 percent performed better in front of an audience than when alone.

Jones and Cobes (23) purported that fifth grade students performed best on a complex and difficult task when peers were present, regardless of the levels of anxiety. Subjects were 120 fifth-grade students who performed on a modified Swedish Labyrinth. Each of the two groups consisted of an equal number of high and low anxious subjects. Each subject was randomly assigned to peer group present condition, and peer group absent condition.

Pessin (33) had thirty-six males and twenty-four females learn lists of nonsense syllables alone and in front of a passive audience. On the average, learning a sequence of seven nonsense syllables was faster when the subjects were alone than when in front of spectators. Moreover, the mean number of errors during acquisition was larger when an audience was present than when the subject was alone.

When given a particular message and a pair of words subjects were found to make the quickest decisions when alone and the slowest decisions before an unseen audience as shown in a study by Wapner and Alper (46). Sixty male and sixty
female college undergraduates were to pick the word they believed to be consistent with the passage they were given. Decisions were timed in three experimental conditions; deciding alone except for the experimenter, deciding before an audience of other subjects and deciding before an unseen audience behind a one-way window. It was also noted that the subjects began to adapt to the various conditions during the one hour testing session.

Ganzer (20) gave seventy-two females differing in test anxiety, five learning trials on a list of nonsense syllables under two different conditions. One condition had an observer present to watch the experiment from behind a one-way mirror and the second condition had a group who received no instruction regarding any observers. All subjects returned to the experiment the following day and were given two re-learning trials. On the first day, observed subjects learned the list less efficiently than did the nonobserved group. No significant effects were attributable to the observers on the relearning task on the second day.

Martens (27) conducted a study with 106 male undergraduate students performing a task on a coincident timer. Results revealed that when learning a complex motor skill, the presence of ten passive spectators significantly impaired performance as compared to individuals performing alone. On the other hand, after the skill had been reasonably well learned, individuals performing in the presence of an
audience were significantly superior to those performing alone. Also, significant increases in palmar sweating occurred among individuals learning and performing with an audience. Martens indicated that the presence of others was arousing to the subjects based upon the results revealed in this study.

Paulus et al. (31) conducted a study to determine the effect of spectator presence on gymnastic performance. It was found that spectator presence led to a significant decrement in quality of gymnastic performance when subjects were given a forewarning of the presence of the spectators but had no overall effect when subjects were not forewarned. The subjects for the study were college level students enrolled in gymnastic classes. One class contained twenty-five male students and one class twenty-one male and female students. Performances were recorded by use of a hidden video tape recorder and later each subject's routine was graded by a group of judges.

Sixteen college athletes and non-athletes were given ten thirty-second practice trials to learn to balance on a stabilometer in a study conducted by Singer (40). The next day they were allowed three more trials alone and three trials before a group of spectators. The three trials in the presence of others actually resulted in generally poorer performances than on the trial immediately preceding, which was executed without the audience. It was concluded that the non-athletes performed significantly better than the athletes on two of the three trials performed in front of the spectators.
In a series of three tests Gates (21) varied the audience from the experimenter only, to a small group of six onlookers, to a large group of twenty-seven to thirty-seven spectators. The tests used in the study were the Coordination (Three Hole) Test, the Woodworth-Wells Color-Naming Test, and one form of Woodworth-Wells Analogies Test. Gates found that the audience had various effects on the subjects and the study failed to show that audience is an asset or a detriment to performance. Differences in scores were slight, and it was determined that more difficult tests should be used with the same testing conditions so greater subject concentration and attention is needed to successfully complete the tests.

Cottrell (11) conducted an experiment in which male undergraduates acted as subjects to fulfill a course requirement. There were thirty-three subjects in each of four cells in the experimental design. Each subject had five anticipation trials on a practice list of noun pairs and then a two minute rest period. The subjects then continued to work on one of two lists presented on a memory drum, either alone or with an audience of two male students present. The audience sat close to the subjects and watched quietly and attentively and the experimenter was concealed from the subject’s view at all times. Results showed that audience did not by itself significantly affect the quality of performance. The difficulty of the lists also affected the performance on the test.

Singer (39) found that quiet spectators had virtually no effect on subjects performing a mirror tracing task. Subjects
for the study were forty college students placed in four equal groups. Testing conditions consisted of either having no spectators view performance or having three male and three female college students quietly sit in a semi-circle around the subject during performance. He concluded that an audience does not always improve or impair performance. In this study subjects improved their performance from trial to trial and Singer suggested that the nature of the motor task used may have minimized the potential impact an audience might have had on the subjects.

Paulus and Cornelius (32) had forty-five students in a gymnastic class to perform a practiced routine either alone, with seventeen spectators from another class and no warning of their presence before entering the room to perform, or with seventeen spectators from another class and a warning of their presence one minute before entering the room to perform. The performance of all subjects was recorded on a video tape recorder which was hidden behind some materials in a corner of the gym. The performances of the subjects was rated on a five-point scale by four certified judges according to the criteria of the International Gymnastic Federation. It was found that in the two spectator conditions the more highly skilled subjects showed greater decrements in performance than the relatively less skilled subjects. This effect was greater in the warning condition than in the no warning condition.
Cox (13) conducted three experiments to investigate the effects of the presence or absence of mothers, teachers, peers, and unknown female adults on the performance of second and third-grade elementary school boys who differed in levels of test anxiety. Subjects were sixty boys, thirty of which scored in the lower twenty-five percent of the Child Form of the Yale Test Anxiety Scale, and thirty who scored in the upper twenty-five percent of the same test. In each experiment subjects performed a marble-dropping task for one minute. During the next five minutes different variations were introduced in the three experiments. In the first experiment the subjects' mother or female teacher entered the room in two of the treatments, while only the experimenter was present during the third treatment. In the second experiment the same three variations listed above were used in addition to a fourth treatment in which a peer of the subject entered the room. In the third experiment the subject's teacher or an unknown female entered the room in two of the treatments while only the experimenter was present in the third treatment. It was found that low test anxious boys showed response increments when any of these persons entered and stayed in the room, while the presence of mothers or teachers resulted in response decrements in high test anxious boys. Conversely, when only the experimenter and subjects were present, low test anxious subjects showed response decrements, while high test anxious boys showed response increments under this condition. Cox
cautions that the conclusions drawn from this study were very firm but were made from a limited and very prescribed population of second and third-grade boys who obtained extreme scores on the Yale Test Anxiety Scales. In addition, all subjects came from upper and upper-middle class families.

Chevrette (9) conducted a study to determine the effect of different conditions of peer group observation on three tests of physical performance as executed by fourth graders. The subjects were thirty-five boys and twenty-four girls who performed three tests. The tests were the vertical hang from the horizontal bar, the grip strength test on the dynamometer, and the shuttle run. Each subject was tested under the following conditions; unobserved, in front of members of the same sex, in front of members of the opposite sex, and in front of a mixed group. He concluded that there were no significant differences in the performance of girls on the three tests due to the different conditions, there were no significant differences in the performance of boys on the grip test or the vertical hang test because of testing conditions, and significant differences due to peer motivating conditions were found with boys when the shuttle run test was administered.

Kozar, as cited in Fisher (26), stated that the very nature of the content and teaching methodology of physical education and athletics, dictates that learning and performance occur in the presence of others. Teachers, coaches,
classmates, teammates, opponents, and various kinds of audiences are always present. Kozar concluded that this should serve to underscore the concern that individuals involved in teaching and coaching ought to have about the concept of social facilitation.

Summary

A review of the literature revealed a limited number of experimental studies related to the effect of classmate observance upon performance of skills tests. The resume' of literature in this chapter focused upon evaluation and skill testing in physical education, the overhand serve in volleyball, the theory of social facilitation, evaluation apprehension, and coaction and audience effects on performance.
CHAPTER BIBLIOGRAPHY


CHAPTER III

PROCEDURES

This study was conducted to determine if female beginning volleyball students at North Texas State University could better perform the overhand serve in one of three treatment conditions involving active or passive observers. The study further sought to determine if one of the three treatment conditions involving active or passive observers was superior for students ranking in the higher, middle, or lower one-third of their class in overhand serving ability.

Preliminary Procedures

A comprehensive review of the literature was conducted. Information related to evaluation and skill testing in physical education, the overhand serve in volleyball, the theory of social facilitation, evaluation apprehension, and coaction and audience effects on performance were included. Information from the review was utilized in the determination of skill test conditions, and interpretation of the results of the testing in relationship to audience effects or the effects of observers on performance.

Subjects

The subjects were seventy-three female undergraduate students enrolled in three beginning volleyball classes at
North Texas State University, Denton, Texas, during the fall semester 1977. All students enrolled in the three classes were selected as subjects in the study. There were twenty-eight students in two of the classes, and seventeen in the third class. Permission for the use of the subjects was obtained from the chairperson of the Department of Health, Physical Education, and Recreation, and the coordinator of the physical education activity program at North Texas State University.

Experimental Design

Subjects attended physical education volleyball classes three times a week on Monday, Wednesday, and Friday for forty-five minutes or two times a week on Monday, and Wednesday, for sixty-five minutes. The subjects received instruction concerning the overhand serve on the fourteenth day of class (or its equivalent in the Monday, Wednesday, class). At least five minutes of practice of the overhand serve was required each class day throughout the period of experimentation. Subjects were asked to serve overhand during all drills and games. Each class was reminded that the serve skill test in their class would be on the overhand serve and therefore it would be advisable to use the overhand serve at all times.

Every two weeks after the volleyball overhand serve was learned, beginning on the seventeenth class day, subjects were required to practice overhand serves individually within
their squads (teams constructed for tournament play in class). Each subject was required to attempt five serves into a court marked for the AAHPER Volleyball Serve Test. Scores were not recorded for these practices (the schedule for these practices may be found in Appendix A).

On the thirtieth class day all subjects were required to attempt ten overhand serves within their squads. The serves were practiced on a court marked for the AAHPER Volleyball Serve Test, and the scores were recorded by the squad leader. Subjects were involved in tournament play for the next two weeks, therefore the next recorded practice day for the overhand serve was the thirty-eighth class day. Scores recorded on this day were used to rank subjects within their classes as to high, medium, or low ability on the overhand serve in volleyball according to standards set in the AAHPER norm table for seventeen-to-eighteen year old females (4).

The results of the test were utilized in assigning subjects to the three skill groups for testing. Each group included a comparable number of high, medium, and low ability subjects in the overhand serve. The subjects were placed in a predetermined testing order so testing would proceed in an organized manner and so the possibility of a sequence effect would be minimized. (A copy of the assignment of subjects to groups, test rotation by groups, and test rotation within groups may be found in Appendix B).

From the seventy-three students enrolled in the three volleyball classes, five subjects were dropped from the study
due to absences on one of the three test days. Subjects were all informed that the scores from the three trials of the volleyball serve test would be averaged to comprise their grade for that particular skill test. Therefore, all subjects were urged to be present on each of the three testing days.

In order to maintain a statistical balance in subjects, two subjects from one skill group and three subjects from a second skill group were randomly eliminated at the conclusion of the testing. Total subjects numbered sixty-three with twenty-one in each skill level group.

The total experimental period consisted of thirty-two class days or the last eleven weeks of a fifteen week course. The first week of the study was utilized for teaching the volleyball overhand serve, with the second through the tenth weeks of the study used for practice of the skill in game and testing situations. The eleventh and final week of the study was used totally for testing of all subjects. Total testing time was approximately forty-five minutes, in each of the three classes, for three class days.

Test Instrument

The American Alliance of Health, Physical Education, and Recreation Volleyball Serve Test (4) was used to measure the subjects' volleyball serving abilities. The decision to use this test was governed by the objectives of the study, review of literature, and availability of facilities and equipment in addition to the facts that the test is standardized and
has established norms. Furthermore, the test measures serving ability, an important skill in the game of volleyball according to Shay (4). It also measures the serve in a game type situation because it involves one performer at a time, provides for accurate scoring, has a sufficient number of trials, is meaningful in that it shows results, and it is judged by criteria which can be applied statistically. Scott (3) stated that all of these characteristics are necessary for a "good test." (A copy of the complete description of the AAHPER Volleyball Serve Test may be found in Appendix C).

Test Administration

The test was administered in the Women's Gymnasium at North Texas State University. All subjects were administered the serve test on court number four, located at the north end of the gymnasium (A diagram of the gymnasium and courts may be found in Appendix D). One week, or three class days of Monday, Wednesday, and Friday, were required to complete the testing. The subjects in the class which regularly met on Monday and Wednesday for sixty-five minutes were asked to meet on Monday, Wednesday, and Friday during the testing period to allow for consistency in test administration.

Each student in the three classes was provided with instructions for each treatment condition prior to the actual testing periods in an effort to avoid confusion on test day. In the instructor only treatment condition, subjects in the group who were not being tested were instructed to wait
outside the northeast gymnasium doors. In the passive observer treatment condition, subjects in the group who were not being tested were instructed to quietly observe. Finally, in the active observers treatment condition, subjects not being tested were assigned duties such as retrieving balls, calling footfaults, and handing balls to the subject being tested. Subjects were instructed in how to call footfaults and practice was provided during class periods.

The subjects not involved in taking the test were participating in other class activities. These activities consisted of competitive games between groups on court number two. Alcorn, Kinder, and Schunert (1) stated that students should have learning activities planned for them if they are not involved in the actual testing.

Prior to the first testing day, instructions for the AAHPER Volleyball Serve Test (Appendix C) and instructions for subjects involved in the testing and in class activities were read to each class. (A copy of instructions read to the subjects may be found in Appendix E). Subjects reporting on the first testing day were read instructions for that particular day. Instructions included directions for the group testing with passive observers, group testing with active observers, and group testing with only the instructor observing performance. The subjects were assigned to their stations after receiving the instructions. Directly adjacent to the court used for testing, a chalkboard was located which
included diagrams of the court and testing stations as well as the assignment of subjects by name to their starting positions. This information was placed on the chalkboard prior to the testing periods. This served as a reminder for the subjects when they reported to the testing station, and it avoided possible confusion. (A copy of the chalkboard diagram may be found in Appendix F).

When each group reported to the testing station, a brief revised list of instructions for the test were read (Appendix G). When the remainder of the subjects at the station were assigned to positions, the test administration began. Upon the completion of test administration for each subject, the group rotated to the next station and test administration continued in this manner until each subject had completed the test.

Subjects taking the AAHPER Volleyball Serve Test had received instructions to complete warm-up serves prior to the testing period. Test instructions were given to the subjects by the test administrator. The instructions were to "serve ten trials with the overhand serve into the opposite court. A trial consists of one attempt to serve or one contact of the ball. You will not be penalized for tossing the ball and then letting it drop if you feel you made a bad toss." If the attempt landed within the proper court boundaries, the instructor recorded the score on the scoresheet according to its placement as measured by the location of the first contact
of the ball with the floor. If the ball failed to land within the proper court boundaries, or touched the net, standards or facilities surrounding the court, it was scored as one trial and a zero was recorded on the scoresheet. Furthermore, if a footfault occurred, the serve counted as one trial and no points were awarded. (A copy of the scoresheet may be found in Appendix H). The test was administered by the instructor (this investigator) to minimize the possibility of variability in the determination of scores. (A complete diagram indicating the position of the test administrators may be found in Appendix I).

Analysis of Data

The data from this study were analyzed by use of a two-way analysis of variance with repeated measures. Rotation of treatments was utilized to control for the possibility of sequence effects. The independent variables were the type of treatment condition and the skill level. Dependent variables were the scores from the testing in each of the three conditions. The $F$ ratio was used to determine if significant differences existed between the mean scores of subjects in the three treatment conditions, as well as between the mean scores of the high, medium, and low skilled subjects in the three treatment conditions. Significance of results was determined by analyzing data at the .05 level of confidence (2). Duncan's multiple range test was used to make comparisons
between means following significant F ratios. Data from this study were analyzed at the North Texas State University Computer Center.

Summary

This chapter described the design and procedures used in the investigation. It included selection of the subjects, selection of the test instrument (AAHPER Volleyball Serve Test), test administration, procedures, and the experimental design for the study.
CHAPTER BIBLIOGRAPHY


CHAPTER IV

PRESENTATION OF DATA

Findings of the Study

The purpose of the present investigation was to determine if female beginning volleyball students at North Texas State University could better perform the overhand serve in one of three treatment conditions involving active or passive observers. The study further sought to determine if one of the three treatment conditions involving active or passive observers was superior for students ranking in the higher, middle, or lower one-third of their class in overhand serving ability.

The design of the study was a three by three factorial. The independent variables were the type of treatment condition (observance of performance by active observers, passive observers, and instructor only) and skill level (high, medium, or low). The dependent variables were the scores from the testing in each of the three treatment conditions. Data collected included practice scores used for ranking of subjects (Appendix B) and the skill test scores of subjects in the three treatment conditions (Appendix K). Data were analyzed by a two-way analysis of variance with repeated measures. Duncan's multiple range test was also administered. The .05 level was used to determine significance for the study.
Determination of performance differences between the three treatment conditions required that each subject's score on the AHPER Volleyball Serve Test in each treatment condition be shown as a mean or average score. Table I includes the means and standard deviations of volleyball overhand serve scores of subjects in the three treatment conditions.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Passive Observers</td>
<td>11.06</td>
<td>8.78</td>
</tr>
<tr>
<td>II. Instructor Only</td>
<td>12.49</td>
<td>8.12</td>
</tr>
<tr>
<td>III. Active Observers</td>
<td>14.02</td>
<td>9.28</td>
</tr>
</tbody>
</table>

The mean score of the skill test with active observers present was 1.53 points higher than with the instructor only present and 2.96 points higher than with passive observers present. There was also a greater variance in skill test scores in the active observer treatment condition than in the other treatment conditions.

The mean score for subjects in the high skill group was 20.17, the medium skill group 13.62, and the low skill group 3.78. These scores correlate with those used for ranking of skill level. The subjects scoring twenty points or above were ranked as highly skilled, fourteen points or above were
ranked as medium skilled, and thirteen points or less were ranked as low skilled. In the AAHPER Volleyball Serve Test, it is not possible to obtain a score with a decimal or fraction since all scoring is in whole numbers and the ten trials are totaled and not averaged. Therefore, the mean score for the medium skill group was rounded to fourteen which correlates with the score used for ranking.

An analysis of variance with repeated measures was computed using subjects scores in each treatment condition to determine if significant differences existed between performance on the volleyball overhand serve test in the three treatment conditions involving active and passive observers. Table II presents the results of the analysis of variance (Table II, p. 48).

The $F$ ratio of 66.90 for the between subject comparison of groups was significant at the .05 level of confidence (15). This indicates that a difference existed in the skill test scores of the three ability groups (high, medium, and low). An $F$ ratio of 10.85 for the within subject comparison of treatments was significant at the .05 level of confidence (15). This indicates that a difference existed between the active observer, passive observer, and instructor only treatment conditions on the volleyball overhand serve skill test scores. In addition, the interaction comparison of treatments and groups yielded an $F$ ratio of 5.04 which was statistically significant at the .05 level of confidence (15).
### TABLE II

**ANALYSIS OF VARIANCE OF VOLLEYBALL OVERHAND SERVE SCORES WITH PASSIVE OBSERVERS, ACTIVE OBSERVERS, AND THE INSTRUCTOR ONLY PRESENT**

<table>
<thead>
<tr>
<th></th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Between subjects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B (Groups)</td>
<td>2</td>
<td>8582.32</td>
<td>4291.16</td>
<td>66.90*</td>
<td>0.000</td>
</tr>
<tr>
<td>Error B</td>
<td>60</td>
<td>3848.83</td>
<td>64.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Within subjects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A (Treatments)</td>
<td>2</td>
<td>274.67</td>
<td>137.33</td>
<td>10.85*</td>
<td>0.000</td>
</tr>
<tr>
<td>AB (Interaction)</td>
<td>4</td>
<td>255.11</td>
<td>63.78</td>
<td>5.04*</td>
<td>0.000</td>
</tr>
<tr>
<td>Error W</td>
<td>120</td>
<td>1518.22</td>
<td>12.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>188</td>
<td>14479.14</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*F .05, df 2/62 = 3.15

According to Klugh (11) interaction is present when the effect produced by variable A depends upon the level or magnitude of variable B. If variable A fails to produce the same effect at all levels of variable B there is an interaction of A and B. In this investigation, variable A (treatment conditions) failed to produce the same effect at all levels of variable B (skill groups); therefore, a significant interaction between treatment conditions and skill groups occurred.

Downie and Starry (9) stated that effects of interaction can best be depicted by the construction of a simple graph of
group means. Figure 1 (p. 50) depicts the interaction effect found in this study. The plotted profiles are not parallel which according to Downie and Starry reveals there is a significant interaction effect. Volleyball overhand serve scores of Group II (medium skill) and Group III (low skill) improved from the passive observer treatment condition to the instructor only treatment condition while Group I (high skill) serve scores decreased between these two treatment conditions. Group I (high skill) and Group II (medium skill) improved their performance from the instructor only treatment condition to the active observer treatment condition whereas, scores for Group III (low skill) decreased between these two treatment conditions.

Duncan's multiple range test was computed to determine if significant differences existed among skill groups. Table III presents the results of this test as applied to group means (Table III, p. 51).

Group I (high skill) scored significantly higher than Group II (medium skill) and Group III (low skill), and Group II (medium skill) scored significantly higher than Group III (low skill). This indicated that subjects were ranked accurately on their volleyball overhand serve ability according to recorded performance scores taken before testing began. Statistically significant results were indicated by the mean difference exceeding the range product value or the necessary value for Duncan's multiple range test.
Figure 1. Interaction of skill group means (serve scores) and treatment conditions.
TABLE III

RESULTS OF DUNCAN'S MULTIPLE RANGE TEST FOR SIGNIFICANT DIFFERENCE BETWEEN HIGH, MEDIUM, AND LOW SKILL GROUPS IN VOLLEYBALL OVERHAND SERVE SCORES

<table>
<thead>
<tr>
<th>Skill Groups</th>
<th>Ranked Means</th>
<th>Mean Diff.</th>
<th>Duncan's Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>I - III</td>
<td>20.17-03.78</td>
<td>16.40</td>
<td>2.94*</td>
</tr>
<tr>
<td>I - II</td>
<td>20.17-13.62</td>
<td>6.56</td>
<td>2.80*</td>
</tr>
<tr>
<td>II - III</td>
<td>13.62-03.78</td>
<td>9.84</td>
<td>2.80*</td>
</tr>
</tbody>
</table>

*F .05, df 2/188 = 2.77

Duncan's multiple range test was used to ascertain among which treatment conditions statistically significant differences existed in performance scores on the AAHPER Volleyball Serve Test. Table IV presents the results of that test.

TABLE IV

RESULTS OF DUNCAN'S MULTIPLE RANGE TEST FOR SIGNIFICANT DIFFERENCE BETWEEN VOLLEYBALL OVERHAND SERVE SCORES IN THE THREE TREATMENT CONDITIONS

<table>
<thead>
<tr>
<th>Treatment Condition Groups</th>
<th>Ranked Means</th>
<th>Mean Diff.</th>
<th>Duncan's Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>III - I</td>
<td>14.02-11.06</td>
<td>2.95</td>
<td>1.31*</td>
</tr>
<tr>
<td>III - II</td>
<td>14.02-12.49</td>
<td>1.52</td>
<td>1.24</td>
</tr>
<tr>
<td>II - I</td>
<td>12.49-11.06</td>
<td>1.43</td>
<td>1.24</td>
</tr>
</tbody>
</table>

*F .05 df 2/188 = 2.77
Treatment Condition III (active observers) was found to be significantly superior to Treatment Condition I (passive observers) for all subjects. Although the scores in Treatment Condition III (active observers) exceeded those of Treatment Condition II (instructor only) by 1.52 points, the difference was not statistically significant. The scores for Treatment Condition II (instructor only) exceeded those of Treatment Condition I (passive observers) by 1.43 points but the difference was not statistically significant.

In order to determine which treatment condition was superior for each of the three skill groups, an average score for each skill group in each treatment condition was computed. Table V includes the means and standard deviations of serve scores for high, medium, and low skill groups in each treatment condition (Table V, p. 53).

The mean score for Group I (high skill) with active observers present was 1.81 points higher than with passive observers present and 2.39 points higher than with the instructor only present during performance. There was a slightly greater variance in the performance of Group I (high skill) with passive observers present than in the other two treatment conditions. The instructor only treatment condition showed the least variance in scores of all groups.

In Group II (medium skill) there was a difference of 2.29 points in mean scores between the active observer treatment condition and the instructor only treatment condition.
TABLE V
MEANS AND STANDARD DEVIATIONS OF SCORES ON THE VOLLEYBALL OVERHAND SERVE TEST FOR HIGH, MEDIUM, AND LOW SKILL GROUPS IN THE THREE TREATMENT CONDITIONS

<table>
<thead>
<tr>
<th>Skill Group</th>
<th>Passive Observers</th>
<th>Instructor Only</th>
<th>Active Observers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>I. High</td>
<td>20.10</td>
<td>5.74</td>
<td>18.52</td>
</tr>
<tr>
<td>(N=21)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. Medium</td>
<td>10.57</td>
<td>5.44</td>
<td>14.00</td>
</tr>
<tr>
<td>(N=21)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III. Low</td>
<td>2.52</td>
<td>3.74</td>
<td>4.95</td>
</tr>
<tr>
<td>(N=21)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In addition, there was a difference of 5.72 points in the mean scores between the active observer treatment condition and the passive observer treatment condition. There was a greater variance in test scores in the instructor only treatment condition for Group II (medium skill).

In Group III (low skill) the instructor only treatment condition showed the highest mean score which was 1.09 points higher than the active observer treatment condition and 2.43 points higher than the passive observer treatment condition. As in Group II (medium skill), the subjects in Group III (low skill) showed the greatest variance in scores in the instructor only treatment condition whereas Group I (high skill) showed the smallest variance in this treatment.
Duncan's multiple range test was computed to determine which treatment condition was superior for each skill group. Table VI includes the results of the test for the high skill group.

**TABLE VI**

RESULTS OF DUNCAN'S MULTIPLE RANGE TEST FOR SIGNIFICANT DIFFERENCE BETWEEN VOLLEYBALL OVERHAND SERVE SCORES OF THE HIGH SKILL GROUP IN THE THREE TREATMENT CONDITIONS

<table>
<thead>
<tr>
<th>Treatment Condition Groups</th>
<th>Ranked Means</th>
<th>Mean Diff.</th>
<th>Duncan's Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>III - II</td>
<td>21.90-18.52</td>
<td>3.38</td>
<td>2.86*</td>
</tr>
<tr>
<td>III - I</td>
<td>21.90-20.10</td>
<td>1.81</td>
<td>2.72</td>
</tr>
<tr>
<td>I - II</td>
<td>20.10-18.52</td>
<td>1.57</td>
<td>2.72</td>
</tr>
</tbody>
</table>

*F .05, df 2/61 = 2.83

Treatment Condition III (active observers) was significantly superior to Treatment Condition II (instructor only) for subjects in the high skill group. Statistically significant results were indicated by the mean difference exceeding the range product value and the needed value for Duncan's multiple range test (3). The scores in Treatment Condition III (active observers) exceeded those in Treatment Condition I (passive observers) by 1.81 points and scores in Treatment Condition I (passive observer) exceeded those in Treatment Condition II (instructor only) by 1.57 points. The difference however, did not approach significance.
Duncan's multiple range test was computed to determine differences between treatment conditions for the medium skill group. Table VII presents the results of the test.

**TABLE VII**

RESULTS OF DUNCAN'S MULTIPLE RANGE TEST FOR SIGNIFICANT DIFFERENCE BETWEEN VOLLEYBALL OVERHAND SERVE SCORES OF THE MEDIUM SKILL GROUP IN THE THREE TREATMENT CONDITIONS

<table>
<thead>
<tr>
<th>Treatment Condition Groups</th>
<th>Ranked Means</th>
<th>Mean Diff.</th>
<th>Duncan's Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>III - I</td>
<td>16.29-10.57</td>
<td>5.71</td>
<td>2.44*</td>
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<td>16.29-14.00</td>
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<td>2.32</td>
</tr>
<tr>
<td>II - I</td>
<td>14.00-10.57</td>
<td>3.43</td>
<td>2.32*</td>
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</tbody>
</table>

*F .05, df 2/62 = 2.83

Treatment Condition III (active observers) and Treatment Condition II (instructor only) were found to be significantly superior to Treatment Condition I (passive observers) for subjects in the medium skill group. Although the mean score in Treatment Condition III (active observers) exceeded the mean score of Treatment Condition II (instructor only) by 2.28 points, the difference did not approach significance.

Duncan's multiple range test was administered to determine differences between treatment conditions for the low skill group. Table VIII presents the results of the test (Table VIII, p. 56).
TABLE VIII
RESULTS OF DUNCAN'S MULTIPLE RANGE TEST FOR SIGNIFICANT DIFFERENCE BETWEEN VOLLEYBALL OVERHAND SERVE SCORES OF THE LOW SKILL GROUP IN THE THREE TREATMENT CONDITIONS

<table>
<thead>
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<th>Duncan's Test</th>
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</thead>
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<td>4.95-2.52</td>
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<td>II - III</td>
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<td>III - I</td>
<td>3.86-2.52</td>
<td>1.33</td>
<td>1.30</td>
</tr>
</tbody>
</table>

*F .05, df 2/62 = 2.83

The greatest mean difference was found between Treatment Condition II (instructor only) and Treatment Condition I (passive observers) with Treatment Condition II (instructor only) showing the 2.42 point higher mean. Treatment Condition II (instructor only) mean score was 1.09 points higher than Treatment Condition III (active observers) and Treatment Condition III (active observers) mean score was 1.33 points higher than Treatment Condition I (passive observers). These differences did not approach significance.

Discussion of the Findings
In the present investigation, sixty-three female subjects were ranked according to their ability to execute the overhand serve in volleyball and were placed in one of three skill groups (high, medium, or low). Subjects performed the AAHPER Volleyball Serve Test with passive observers, active observers, and the instructor only present and observing performance.
These three treatment conditions were used in order to determine possible differences in performance with various observers present and to determine if one type of observation was superior to others for all subjects. In addition, the three treatment conditions were used to determine if one type of observation was superior to others for subjects in each skill group.

There is some concern in the literature that social facilitation and audience effect cannot occur without the potential for evaluation being present. Martens (13) stated that the presence of others is not the prime source for producing social facilitation but that evaluation apprehension is the prime source. Cottrell (4) stated that anticipated evaluation is necessary for performance to be facilitated. The present study provides for the evaluation potential since subjects were taking the serve test as a required class skill test which counted ten percent of their final grade. All subjects were aware of this fact and therefore the question of providing evaluation potential was accounted for.

According to several previous studies (8, 10, 12, 14, 19), performance is enhanced by the presence of others, or the presence of an audience. The mean score for subjects with active observers present was 14.02 and was the highest mean score. This finding would seem to substantiate the results in previous studies. However, other studies that looked at passive audiences in particular (6, 20, 21) have shown that
performance is improved in the presence of passive (or quiet) spectators. In the present investigation the mean score for subjects performance with a passive audience present was 11.06, the lowest of the three treatment conditions. The presence of a passive audience in this study appeared to impair performance. This may be explained by the varying degrees of skill of the sixty-three subjects in the study. Cratty (7) postulated that many factors must be taken into account when looking at performance changes due to observation or audience. According to Singer (17, 18) audiences usually have positive effects on performance of individuals but that exceptions may be found when examining the skill level of the performer. The mean score for the instructor only treatment condition was 12.49 which ranked second overall.

A two-way analysis of variance revealed significance between the three skill groups, the three treatment conditions, and a significant interaction effect. Duncan's multiple range test was used to determine the areas of significance.

When examining skill group means, Duncan's multiple range test revealed the high skill group to be significantly superior to the medium and low skill groups and the medium skill group to be significantly superior to the low skill group. This indicates subjects were correctly ranked according to their overhand serve ability and group means indicated that subjects performed consistently with these rankings during testing for this study.
The results of Duncan's multiple range test as applied to treatment condition means showed performance with active observers present was significantly superior to performance with passive observers present for all subjects. As discussed previously, many studies have found that performance in the presence of an audience is significantly better than performance alone. In most of the studies the type of audience was passive as opposed to active and the study was performed in a laboratory setting as opposed to a social setting such as a classroom. Cox (6) conducted an experiment involving passive spectators and stated that it was not possible to compare his results "directly" with those obtained in any other study due to differences in experimental treatments. The present investigation deals with some experimental conditions not present in previous studies and includes the factor of skill level. Therefore, the findings cannot be "directly" related to those of other studies, but may be related in a general sense.

Other comparisons of the treatment conditions means revealed the instructor only treatment condition to be 1.43 points better than the passive observer treatment condition and the active observer treatment condition to be 1.52 points better than the instructor only treatment condition. However, since neither comparison reached significance, a recommendation for a best treatment for all subjects cannot be made.
Subjects in the high skill group were found to perform significantly better with active observers present than with the instructor only present. While performance scores of subjects in the passive observer treatment condition were better than those in the instructor only treatment condition the differences were not statistically significant. These findings substantiate previous results by Jones and Cobes (10) who found that in general subjects work best when peers are present. In addition the results support the statement by Singer (18) that the "better" skilled athletes are less likely to be effected by crowd behavior. These findings lend support to the social facilitation theory (21) which contends that if dominant responses (correct responses) occur a majority of the time and the response is well learned performance is aided in the presence of spectators. According to Cottrell et al. (5) the presence of an audience enhances the emission of dominant responses. Therefore, it is possible that many factors previously mentioned worked together in this study resulting in superior performance for the highly skilled subjects in the presence of passive observers.

Performance in the medium skill group was found to be significantly superior with active observers or the instructor only present than with passive observers present. Although the active observer treatment condition mean scores were higher than the instructor only treatment condition mean scores the difference did not approach significance. The
mean scores in the passive observer treatment condition were extremely low and fell into the low skill category according to rank. The active observer treatment condition mean score was higher than the passive observer treatment condition score and the instructor only treatment condition mean score was higher than the passive observer treatment condition mean score. These findings indicate that passive observers do not enhance performance. This conflicts with previous studies (6, 17, 20) which found passive observers to enhance performance. Martens (13) states that mere presence of an audience facilitates performance of well learned tasks since the subject is aroused and more frequently emits the correct response. It is possible that since these subjects were ranked as medium in skill, the task of serving a volleyball overhand was not learned well enough for emittance of correct (dominant) responses a majority of the time, thereby causing a variance in performance. However, this is an assumption.

Singer (16) explained that with practice and familiarization with the situation of performing a particular skill in front of an audience, performance will tend to improve and the effects of past bad experiences in front of a crowd will usually be overcome. This idea may offer another explanation for the active observer treatment condition being superior to the passive observer treatment condition in this situation with the medium skill group as well as in other situations in this investigation. Since some practice for
the present study was done in groups (or squads) and in the classroom setting, it is possible that familiarization with this type of situation as described by Singer could account for the better performance of subjects with active observers present even though various forms of practice were used.

In a study completed by Chevrette (2) no significant difference was found in the performance of girls on three physical tasks due to different peer observation conditions. Results of Duncan's multiple range test in the present study for subjects in the low skill group showed no significant differences between treatment conditions. These findings are consistent with those of Chevrette. These findings are in contrast with those of Carment and Latchford (1) who found the presence of the experimenter had an energizing effect on performance of individual subjects and coactors. It should be emphasized that the present study examined subjects of three levels of skill (high, medium, and low) within a beginning level volleyball class. It is possible that since these subjects were ranked as low skilled beginners the task of serving a volleyball overhand may not have been learned well enough for the correct response (correct performance) to be emitted from one trial to another, thereby causing a variance in performance. Such variability may explain why no significant differences occurred between the three treatment conditions for low skilled subjects in the present investigation as well as explaining why the instructor did not cause
an energizing effect on performance as noted by Carment and Latchford.

Summary

Data in the present investigation were analyzed by the analysis of variance method. A significant difference was found between the passive observer, active observer, and instructor only treatment conditions and between the high, medium, and low skill groups. A significant interaction was also found. These results were subjected to Duncan's multiple range test and significant differences were found between the passive observer and active observer treatment conditions and between the high and medium, high and low, and medium and low skill groups.

Duncan's multiple range test was then applied to the high, medium, and low groups individually to determine differences between treatment conditions for various skill levels. In the high skill group significant differences were found between the active observer treatment condition and the instructor only treatment condition. In the medium skill group significant differences were found between the active observer treatment condition and the passive observer treatment condition as well as the passive observer treatment condition and the instructor only treatment condition. No significant differences were found between treatment conditions in the low skill group.
CHAPTER BIBLIOGRAPHY


Purposes and Procedures

The purposes of the study were (1) to determine if female beginning volleyball students at North Texas State University perform best on the AAHPER Volleyball Serve Test with only the instructor actively observing and recording performance, (2) to determine if female beginning volleyball students at North Texas State University perform best on the AAHPER Volleyball Serve Test with several classmates passively observing performance and the instructor observing and recording performance, (3) to determine if female beginning volleyball students at North Texas State University perform best on the AAHPER Volleyball Serve Test with the instructor and several classmates actively involved in duties associated with administering the skill test such as recording and ball retrieving, and not intently watching the total performance, (4) to determine which of the three conditions was best for performance of female beginning volleyball students at North Texas State University ranking in the higher, middle, and lower one-third of their class in overhand serve ability, and (5) to examine the interaction effect of skill level and treatment conditions.

The subjects were sixty-three female undergraduate students enrolled in three beginning volleyball classes at North
Texas State University, Denton, Texas, during the fall semester 1977. Two classes contained twenty-eight students and the third contained seventeen students. Five students were eliminated from the study due to absences and five were randomly eliminated from two skill groups at the end of testing in order to maintain a statistical balance.

The total experimental period consisted of thirty-two class days or the last eleven weeks of a fifteen week course. Subjects received instruction concerning the overhand serve on the fourteenth day of class. At least five minutes of warm-up practice of the overhand serve was required each day throughout the period of experimentation. Every two weeks after the serve was learned, beginning on the seventeenth class day, subjects practiced the overhand serve individually within their squads (teams for class). On the thirty-eighth class day all subjects were required to attempt ten overhand serves into a court marked for the AAHPER Volleyball Serve Test. Scores on the volleyball overhand serve test were recorded and used to rank subjects as to high, medium, or low skill ability according to standards set in the AAHPER norm table (1) for seventeen-to-eighteen year old girls. Subjects were then randomly assigned to one of three groups for testing within their class. A predetermined testing order was utilized to minimize possible sequence effects.

The eleventh and final week of the study was used for testing of all subjects. Total testing time was approximately
forty-five minutes, in each of the three classes, for three class days.

The testing instrument used to measure overhand serving ability was the AAHPER Volleyball Serve Test (1). The tests were administered in the Women's Gymnasium at North Texas State University. Each subject was provided with instructions for each of the three treatment conditions prior to the testing periods.

Warm-up serves were provided prior to the beginning of testing. Each subject then attempted to serve ten trials into the opposite court. Each subject took the test under each of the three treatment conditions. The instructor (this investigator) administered all tests. Subjects not being tested were participating in competitive games on a non-adjacent volleyball court.

Data were analyzed by the analysis of variance method with repeated measures to determine significant differences between skill groups and between treatment conditions. Alpha was .05. Duncan's multiple range test was administered following significant F ratios.

Results

The following are the results of the present investigation:

1. A significant difference existed between the active observer treatment condition and the passive observer treatment condition for all subjects;
2. No significant difference was found between the active observer and instructor only treatment conditions or between the passive observer and instructor only treatment conditions for all beginning subjects;  

3. A significant difference was found between the active observer treatment condition and the instructor only treatment condition for subjects in the highly skilled beginners group;  

4. No significant difference existed between the active observer and passive observer treatment conditions or between the passive observer and the instructor only treatment condition in the highly skilled beginners group;  

5. A significant difference existed between the active observer treatment condition and the passive observer treatment condition, and the passive observer treatment condition and the instructor only treatment condition for subjects in the medium skilled beginners group;  

6. No significant difference was found between the active observer and instructor only treatment conditions in the medium skilled beginners group;  

7. No significant differences were found between treatments for subjects ranked as low skilled beginners in volleyball overhand serve ability;  

8. There was a significant interaction effect between skill groups and treatment conditions.  

Conclusions  
The results of the investigation would appear to justify the following conclusions:
1. Female beginning volleyball students at North Texas State University perform better on the AAHPER Volleyball Serve Test with active observers present than with passive observers present.

2. Female volleyball students at North Texas State University who are ranked as highly skilled beginners on the AAHPER Volleyball Serve Test perform better with active observers present than with the instructor only present.

3. Female volleyball students at North Texas State University who are ranked as medium skilled beginners on the AAHPER Volleyball Serve Test perform better with active observers and the instructor only present than with the passive observers present;

4. Female volleyball students at North Texas State University who are ranked as low skilled beginners showed no significant differences in performance between the three treatment conditions.

Recommendations

The following recommendations are offered:

1. A replication of this study should be conducted using male subjects at the university level;

2. This study should be repeated using junior and senior high school males and females;

3. Further investigations of a similar nature should be conducted in which other sports skills are examined;

4. This study should be repeated using peer observation groups of larger sizes;
5. A replication of this study should be conducted using a paper-pencil type instrument to examine the relationship between psychological attitude prior to testing and performance in various treatment conditions;

6. This study should be repeated having subjects of high skill ability perform in various treatment conditions with a peer group composed only of other highly skilled subjects observing their performance. This should also be done having medium skilled subjects perform only with other medium skilled subjects observing, and having low skilled subjects perform only with other low skilled subjects observing.

Summary

This chapter presented a summary of the purposes and procedures of this investigation, as well as the results and conclusions of the study. Recommendations for future investigations involving performance of other sports skills, populations, and treatment conditions were included.
CHAPTER BIBLIOGRAPHY

## APPENDIX A

### LEARNING AND PRACTICE SCHEDULE FOR THE OVERHAND SERVE

<table>
<thead>
<tr>
<th>WEEK</th>
<th>DAY(S)</th>
<th>ACTIVITY</th>
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<td>1-5</td>
<td>1-13</td>
<td>Volleyball skills other than the overhand serve</td>
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<td>5</td>
<td>14</td>
<td>Overhand serve taught</td>
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<td>17</td>
<td>Practice five overhand serves in squads</td>
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<td>8</td>
<td>23</td>
<td>Practice five overhand serves in squads</td>
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<tr>
<td>10</td>
<td>29</td>
<td>Practice five overhand serves in squads</td>
</tr>
<tr>
<td>10</td>
<td>30</td>
<td>Practice ten overhand serves into a court marked for the AAHPER Volleyball Serve Test in squads - scores recorded by squad leader</td>
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<td>11-12</td>
<td>31-36</td>
<td>Class Tournament</td>
</tr>
<tr>
<td>13</td>
<td>38</td>
<td>Practice ten overhand serves into a court marked for the AAHPER Volleyball Serve Test in squads - scores recorded and used to rank students for testing</td>
</tr>
<tr>
<td>15</td>
<td>43-45</td>
<td>Testing</td>
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</tbody>
</table>

Subjects were instructed "the practice sessions are to give you time to work on your overhand serves and to give you feedback as to your progress with the skill. The court is marked just as it will be for the class required skill test which will be given the first week of December. Therefore,
these practice sessions are excellent opportunities to practice for that test. Scores that are recorded will not be used for grading purposes, but to keep you informed concerning your improvement from one practice session to the next. Give your best effort at all times so your score will reflect your ability."
APPENDIX B

RECORDED OVERHAND SERVE SCORES AND RANKINGS

12:00 Class

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1:00 Class

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*H = High skilled, M = Medium skilled, L = Low skilled

75
### 2:00 Class

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</table>

*H = High skilled, M = Medium skilled, L = Low skilled

### 12:00 Class Ranks
- 9 High
- 11 Medium
- 8 Low

### 1:00 Class Ranks
- 5 High
- 6 Medium
- 6 Low

### 2:00 Class Ranks
- 7 High
- 9 Medium
- 12 Low

28 TOTAL

17 TOTAL

28 TOTAL

Subjects from these ability groupings were randomly assigned to groups. Examples of these assignments may be found on page 77.
EXAMPLE OF RANDOM ASSIGNMENT OF SUBJECTS TO GROUPS ACCORDING TO RANKING

12:00 CLASS

SKILL LEVEL

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1:00 CLASS

SKILL LEVEL

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2:00 CLASS

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TESTING SCHEDULE AND ROTATION OF TREATMENTS AND GROUPS

DAY 1

12:00 CLASS  1:00 CLASS  2:00 CLASS
(Treatment A)  (Treatment B)  (Treatment C)
1. Group 1    1. Group 1    1. Group 1
2. Group 2    2. Group 2    2. Group 2

DAY 2

12:00 CLASS  1:00 CLASS  2:00 CLASS
(Treatment B)  (Treatment C)  (Treatment A)
2. Group 3    2. Group 3    2. Group 3
3. Group 1    3. Group 1    3. Group 1

DAY 3

12:00 CLASS  1:00 CLASS  2:00 CLASS
(Treatment C)  (Treatment A)  (Treatment B)
2. Group 1    2. Group 1    2. Group 1

TREATMENT A = Testing with passive observers
TREATMENT B = Testing with instructor only
TREATMENT C = Testing with active observers
SUBJECT ROTATION WITHIN GROUPS

The following rotation plan indicates how subjects rotated within their own group from day to day. The rotation plan was developed for nine subjects in each group. Substitute names were used in order to maintain anonymity.

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<td>L - Shelley</td>
<td>H - Jane</td>
<td>M - Margie</td>
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H = High skilled, M = Medium skilled, L = Low skilled
Figure 2. Court diagram and court markings for the AAHPER Volleyball Serve Test.
EXPLANATION OF AAHPER VOLLEYBALL SERVE TEST

A. Purpose
To measure the player's skill in serving as in an actual game.

B. Equipment
Volleyballs, volleyball net, standards, and court marked as in diagram.

C. Description
Server X stands opposite the marked court in the proper serving position. She must use a legal overhand serve in hitting the ball over the net into the opposite court.

D. Rules
1. Server is given ten trials.
2. When the ball hits the net and does or does not clear the net, it is recorded as a trial but no points are given.

E. Scoring
The score is the total number of points recorded, determined by location of the ball landing in the opposite court. Balls landing on a line will receive the higher score designated for the areas. Forty points is the maximum score.
Figure 3. Court locations at the Women's Gymnasium, North Texas State University, Denton, Texas.
APPENDIX E

GENERAL INSTRUCTIONS FOR SUBJECTS TAKING THE AAHPER VOLLEYBALL SERVE TEST

"The purpose of this test is to measure your serving ability in volleyball. You will take a position on the end of the court opposite the marked court and in the proper service area. A rack of balls will be located next to you. When you are ready to begin serving take a ball from the rack and prepare to begin testing. Practice serves are allowed before class begins and before testing begins.

When all of your group members are in their proper positions the testing will begin. On the signal "serve" you will toss the first ball and contact it in an overhand manner. If the ball lands out of bounds, in the net, touches the net, standards, walls, or ceiling, your score will be recorded as zero, and a trial will have been used. When a footfault occurs (stepping on or over the baseline before touching the ball) it will count as a trial and a zero will be recorded. You will continue until you have served ten trials and then you will rotate to the next position as indicated.

During the testing period, the score value of each serve will be recorded on the scoresheet by your name. The point value will be announced for all serves landing within the boundaries of the proper court. A ball that is unquestionably out of bounds or a poor serve will not be called out as
zero. Serves that are close to a line but out of bounds will be called "out." Serves that barely touch the net will be called "net." If you feel that you tossed the ball poorly you may catch it and retoss without penalty.

Each student's final score will be calculated at the end of the testing period by totaling the point value of the ten serves. At the completion of three days of testing your scores will be totaled and averaged for your overhand serve score. This score will be converted into a grade that will be computed as ten percent of your semester grade. If you miss a test due to absence, your score for that day will be a zero and will be averaged with the remainder of the scores.

The groups not being tested will be participating in a modified volleyball game on court two. The modified game will start with an overhead volley from right front position. Rotation and rules will apply the same as in a regular game, but the ball will not be put into play with a serve. Work on your skills of the bump, set, and spike play after the volley. Players waiting to rotate into the game, please sit facing court one until it is your turn to play. Court four will be used for testing. Please do not come into the testing area! Wait until your group is called to come to the testing area."

Instructions were then read to the subjects pertaining to the passive observer, active observer, and instructor only treatment conditions. These instructions were read prior to
the week of testing to familiarize the subjects with the
testing environment. On the actual testing days, only those
instructions for the treatment condition used on that partic-
ular day were read. Copies of these instructions may be found
on pages 86-90.

Subjects were then allowed to ask any questions. Fol-
lowing the question and answer period the testing order for
that particular day was read. The following is an example of
the testing order:

- Group 1 will be tested first
  - Group 2 and Group 3 will play a modified game

- Group 2 will be tested second
  - Group 1 and Group 3 will play a modified game

- Group 3 will be tested third
  - Group 1 and Group 2 will play a modified game
INSTRUCTIONS FOR TESTING WITH PASSIVE OBSERVERS

"When the assigned group comes into the testing area a diagram including position assignments will be on the chalkboard. The name of the person to be tested first will be announced. The observers will then take their places so testing may begin.

When your name is called enter the service area. The rack of balls will be located next to you. When you are ready to serve, take a ball from the rack and wait for the command "serve." You may then toss the ball and attempt to serve the ball overhand into the opposite court. While you are waiting to be tested stand behind the baseline or beside the sideline on the side of the court opposite the server.

Look at the diagram on the board. The "X" indicates the position of the server and the circles indicate the location of the observers.

When you are an observer please do not talk to the server or anyone close to you. Please do not make any noises or gestures that might disturb the server. You are to merely watch the server as she attempts her ten trials of the overhand serve. If a served ball is coming directly at you, you may stop it so it will not hit you, but remain in your assigned position. The balls will come to rest at the walls. Do not retrieve the balls until the server has finished all ten serves. If a served ball strikes a ball that is in the court a replay will be allowed.
After each server has completed her ten trials, the observers will collect all the balls and place them on the alternate rack located on your side of the court. The person who served last will roll the empty rack over to the opposite side of the court as they come over to become an observer. The person who will be tested next will roll the full rack of balls over to the serving side of the court and prepare for testing. We will proceed in this manner until each person in the group has served the ten trials."
INSTRUCTIONS FOR TESTING WITH THE INSTRUCTOR ONLY
OBSERVING PERFORMANCE

"When the assigned group comes into the testing area the testing order will be on the chalkboard. The first person to be tested will enter the proper service area. The rack of balls will be located next to you. When you are ready to serve, take a ball from the rack and wait for the command "serve." You may then toss the ball and attempt to serve the ball overhand into the opposite court. While you are waiting to be tested stand outside the northeast exit of the gymnasium.

When the server has completed her ten trials you will be called to come back into the gymnasium. Collect all the balls as quickly as possible and place them on the alternate rack. The next server will take the full rack of balls to the serving side of the court. The person who just completed the test will roll the empty rack to the opposite side of the court and join the remainder of the group outside the exit. Balls that come to rest in the court and are hit by a served ball will be replayed.

Look at the diagram on the board. The "X" indicates where the server stands and the circles indicate where you will be waiting to be tested. Please remain near the vicinity of the gymnasium doors so you will be able to hear when you are called to return. We will continue in this manner until each of you has completed the test."
INSTRUCTIONS FOR TESTING WITH ACTIVE OBSERVERS

"When your group comes to court four to be tested a diagram showing your positions will be on the chalkboard. I will read the name of the person to be tested first and those of you who have duties associated with the testing will take your places so testing may begin.

Look at the diagram on the board for your exact location for each assigned duty. The server is indicated by an "X" and all other positions are marked with a circle. The observer located to the right of the server will call footfaults. Watch the person being tested for the possibility of committing a footfault (stepping on or over the baseline before the ball is hit). If this occurs, call out "footfault." Please stand at least five feet to the side of the baseline so you do not interfere with the person being tested. (This duty is eliminated for the 1:00 class due to the size of the groups).

Three or four observers will act as ball retrievers and position themselves behind the baseline at the opposite end of the court from the server. Retrieve all balls and slowly roll them under the net to the person in the corner at the opposite end of the baseline from the server. One observer will act as a sideline judge and assist in calling serves which land close to the sideline opposite me. Any ball landing within one to two feet of the sideline should be called "in" or "out" immediately.
One or two observers will be used to receive balls rolled under the net from the ball retrievers. Place the ball on the rack near you so there will be a continuous supply of balls to the servers. Another observer will stand approximately three or four feet to the left of the server. This observer will furnish the server with a ball after they have completed the previous serve. Keep the balls available for the server so the testing may move smoothly and efficiently. The rack of balls should be on the left side in order that ball retrievers may place balls on the rack without disturbing the server.

While serving, the balls will be handed to you from your left. When you receive the command "serve," begin tossing the ball. Attempt to serve the volleyball overhand into the opposite court. Following the completion of ten serve trials, rotate one position counterclockwise. The person who furnished the server with balls becomes the new server. Testing will continue in this manner until each person in the group has completed the test."
Figure 4. Example of diagrams on the chalkboard at the testing station for subjects in the active observer treatment condition.
APPENDIX G

BRIEF REVISED LIST OF INSTRUCTIONS READ TO SUBJECTS AT THE TESTING STATION

1. You will be allowed ten trials.

2. You must serve overhand and be aware of the line in order to avoid footfaults.

3. If you make a bad toss, a retoss will be allowed.

4. Please be sure to report to the proper station (or location) as soon as your name is called.

5. If you forget the rotation plan refer to the chalkboard diagram for directions.

6. The testing order will be as follows:
   1. Mary
   2. Sue
   3. Janet
   4. Cathy
   5. Amy
   6. Martha
   7. Sharon
   8. Margie
   9. Jane
APPENDIX H

TRIALS

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Figure 5. Score sheet for the AAHPER Volleyball Serve Test.
Groups contain nine or ten subjects:

1. server
2 - 10 are passive observers - (if the ball comes to one of these persons they may stop the ball and roll it to the wall behind them).

(I) = instructor (investigator)

Figure 6. Diagram of court positions for subjects in the 12:00 and 2:00 classes when being tested in the passive observer treatment condition.
Groups contain five or six subjects:

1. server
2 - 6 are passive observers - (if the ball comes to one of these persons they may stop the ball and roll it to the wall behind them).

(I) = instructor (investigator)

Figure 7. Diagram of court positions for subjects in the 1:00 class when being tested in the passive observer treatment condition.
Groups contain five, six, nine, or ten subjects:

1. server
   (I) = instructor
   (investigator)

All other subjects will wait outside the north-east exit directly adjacent to court four.

Figure 8. Diagram of court positions for subjects in all three classes when being tested in the instructor only treatment condition.
Groups contain nine or ten subjects:

1. server
2. call footfaults
3 - 6 chase balls and roll them to 8 or (10)
7. help watch sideline
8. receive balls and put balls on the rack
9. hand balls to server
10. if there are ten in a group, she will help put the balls on the rack

(I) = instructor (investigator)

Figure 9. Diagram of court positions for subjects in the 12:00 and 2:00 classes when being tested in the active observer treatment condition.
Groups contain five or six subjects:

1. server
2. retrieve balls - if six in the group (4) will help retrieve balls
5. receive balls and put them on the rack
6. hand balls to server (I) = instructor (investigator)

Figure 10. Diagram of court positions for subjects in the 1:00 class when being tested in the active observer treatment condition.
TABLE IX

VOLLEYBALL OVERHAND SERVE SCORES OBTAINED BY SUBJECTS IN THE PASSIVE OBSERVER, ACTIVE OBSERVER, AND INSTRUCTOR ONLY TREATMENT CONDITIONS

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Treatment A = Performance with passive observers
Treatment B = Performance with instructor only
Treatment C = Performance with active observers
BIBLIOGRAPHY

Books


**Articles**


Unpublished Materials