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A Comparison of the Volley & Ground-Stroke Methods of Teaching Beginning Tennis Utilizing the Command & Task Teaching Techniques

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Neil T.

1978

A COMPARISON OF THE VOLLEY AND GROUND-STROKE METHODS
OF TEACHING BEGINNING TENNIS
UTILIZING THE COMMAND AND TASK TEACHING TECHNIQUES

A Thesis
Presented to
the Faculty of the Department of Physical
Education and Recreation
Western Kentucky University
Bowling Green, Kentucky

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

by
Neil T. Decker
August 1978

A COMPARISON OF THE VOLLEY AND GROUND-STROKE METHODS
OF TEACHING BEGINNING TENNIS
UTILIZING THE COMMAND AND TASK TEACHING TECHNIQUES

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Designed to compare the effectiveness of two beginning tennis teaching methods and two teaching techniques, this study used ninety-seven male and female students enrolled in four beginning tennis classes as subjects.

After pretests, the Dyer Wallboard and the Broer-Miller Forehand-Backhand Drive Tests, each class was instructed in one of the two designated methods and by one of the two techniques. Thirteen 45-minute sessions of instruction were followed by posttesting.

A two-way analysis of covariance, using the pretests as the covariate, was computed with the data provided by the two dependent variables.

Results of the statistical analysis of the data revealed significant ($P < .05$) differences of effectiveness in that the volley method was more effective than the ground-stroke method, based on the Dyer test analysis, and the task technique was more effective than the command technique, based on the Broer-Miller test analysis.

CHAPTER I

STATEMENT OF THE PROBLEM

Introduction

Tennis is a game involving many skills, but its complexity tends to discourage novice players. Valued as a lifetime sport, participation in tennis within the United States has more than tripled in the past ten years, despite complexity in learning the skills involved (6). A common problem of the beginner is the inability to make contact with the ball and stroke it effectively enough to feel a degree of success. Without early success, many aspirants of the game lose interest in learning to play at all.

It is a continuing concern of tennis instructors, coaches and teaching professionals to seek out the best methods and techniques of teaching beginners the skills of tennis and simultaneously produce feelings of success within their students as quickly as possible.

This concern and the evident popularity of tennis was influential in the development of this study. Methods and techniques of teaching have always been questioned and this study is but one attempt at providing answers to some particular questions. In comparing the relatively "new"

volley method, the "traditional" ground-stroke method, and the command and task teaching techniques, additional knowledge about each of these factors will be established. Additional knowledge may be valuable to coaches and teachers alike in their teaching of beginning tennis as well as other similarly taught activities or sports.

Statement of the Purpose

The purpose of this study is to ascertain which of the two methods of teaching beginning tennis, volley or ground-stroke, is most effective and to evaluate each method on the basis of which of the two following techniques can most effectively be used to teach tennis to beginners: command technique or task technique.

Definition of Terms

1. Volley Method. The method of teaching beginning tennis in which the volley stroke is taught first, followed by the forehand, backhand and serve respectively. Instruction begins at the net and progresses to the baseline.
2. Ground-stroke Method. The "traditional" method of teaching beginning tennis in which the forehand and backhand ground-strokes are taught first, followed by the volley and the serve respectively. Instruction begins at the baseline and progresses to the net.

3. Command Technique. The technique of teaching tennis based upon command-response interaction between the teacher and the students. Students become conditioned to lining up in prescribed formations. Explanations and demonstrations are provided by the teacher while the students listen, observe and imitate. This technique is very direct, formal and authoritarian.
4. Task Technique. The technique of teaching tennis in which the students have more freedom to learn at their own rate. The teacher gives explanations and demonstrations but releases the students to perform and practice the skills on their own. This technique is indirect, informal and democratic.
5. Dyer Wallboard Test. This tennis skill test measures the ability to rally with forehand and backhand drives. Described in Chapter III, it was used as a dependent variable in this study to provide pre- and posttest scores of tennis skill.
6. Broer-Miller Forehand-Backhand Drive Test. This tennis skill test measures the strength and accuracy of ground-strokes or the ability to place drives in the back court. Described in Chapter III, it was used as a dependent variable in this study to provide pre- and posttest scores of tennis skill.

Delimitations of the Study

This study was delimited to an investigation of the effectiveness of the following four factors in teaching beginning tennis: the volley method and ground-stroke method taught by the command technique and task technique. This study was also delimited to the use of ninety-seven subjects enrolled in four co-educational, beginning tennis classes during the second bi-term of the Spring semester of 1978 at Western Kentucky University.

Limitations of the Study

The limitations of this study include: (1) the subjects were not chosen by random sampling, (2) the sex ratio of the subjects in the total sample was unequal, (3) there was a lack of control of the influences of student's activities outside of class, and (4) weather conditions during class was a possible limiting factor of this study.

Statement of the Hypotheses

1. There will be no significant difference in the skill achievements of the subjects taught by the ground-stroke method and the subjects taught by the volley method when measured by the Dyer Wallboard Test.

2. There will be no significant difference in the skill achievements of the subjects taught by the ground-stroke method and the subjects taught by the volley method

when measured by the Broer-Miller Forehand-Backhand Drive Test.

3. There will be no significant difference in the skill achievements of the subjects taught by the command technique and the subjects taught by the task technique when measured by the Dyer Wallboard Test.

4. There will be no significant difference in the skill achievements of the subjects taught by the command technique and the subjects taught by the task technique when measured by the Broer-Miller Forehand-Backhand Drive Test.

5. There will be no significant interaction effect in skill achievements of the two treatment variables when measured by the Dyer Wallboard Test.

6. There will be no significant interaction effect in skill achievement of the two treatment variables when measured by the Broer-Miller Forehand-Backhand Drive Test.

Assumptions of the Study

It is assumed that the skill level indicated by the pre-tests is an accurate indication of the initial ability of each of the subjects. It is also assumed that the willingness of the subjects toward learning is equal within each group and between groups.

Summary

In this chapter a statement of the problem was presented. The purpose was stated, definitions of terms specific to this study were provided to aid the reader in interpretation of the study, delimitations and limitations were listed and the hypotheses and assumptions were noted.

A review of literature related to this study will be presented in Chapter II.

CHAPTER II

REVIEW OF RELATED LITERATURE

Introduction

This chapter presents literature related to and responsible for initiating this study. Previous studies have indicated the need for further investigation relative to effective teaching methods and techniques. The literature presented in this chapter is classified into two areas: (1) literature dealing with the volley and ground-stroke methods of instruction and (2) literature related to the command and task techniques of teaching.

Literature on the Volley and Ground-Stroke Methods

A study by Burrus-Bammel (3) in 1976 compared the traditional ground-stroke and volley methods of teaching beginning tennis. Forty-two college students in six beginning co-educational tennis classes at Occidental College were used as subjects in the study. Following the pretests (the Broer-Miller Forehand-Backhand Drive Test and the Revised Dyer Wallboard Test), classes met twice a week for a total of fourteen 40-minute sessions of tennis instruction. The pretests were repeated as posttests at the end of the seven-week instructional period. The study

concluded that both methods produced significant skill acquisition but the volley method produced significantly (.05) better results for the forehand.

Southward (12) stated that a beginner would benefit most by starting with the volley stroke in learning tennis skills. A cinematographic analysis of the strokes of beginners in tennis classes at Michigan State University revealed three main problems of the beginner.

First, a beginner cannot judge where the ball will bounce in relation to the end of his racquet head. Secondly, a beginner cannot feel the position of the face of the racquet head. Finally, a beginner's feet are rarely firmly planted as a base, but tend to shift positions with ball contact; this is especially true of the forward foot. The result of this is a loss of power and control.

Southward felt that the main purposes in teaching the beginner is to get him to become aware of the length of the racquet and arm as it swings around the body, the location of the racquet face and to watch the ball constantly.

Emphasis on learning these specific skills in the volley method caused Southward to respect it as the most effective method for teaching beginners.

Literature relative to comparisons between the volley and ground-stroke methods is scarce. As the name denotes, the "traditional" ground-stroke method is the more accepted and utilized method of instruction. The study by Burrus-Bammel, however, is a unique effort of questioning the

traditionally accepted method with innovative ideas for better methods of teaching.

Literature on the Command and Task Techniques

In this section it is important to note that the aspects of traditional, formal and direct techniques are related to the command technique of teaching. Likewise, aspects of informal, indirect and programmed techniques are similar to aspects of the task technique.

In 1970, Mariani (9) compared the effectiveness of the command technique and task technique of teaching beginning tennis strokes. Mariani used sixty male college students divided into two groups. Each group met two hours a week for a total of twelve hours of instruction. The Broer-Miller test was administered as the criterion instrument. The following conclusions resulted from the study: both methods showed equal effectiveness in teaching the forehand stroke but the task method was superior in teaching the backhand stroke.

Farrell (4) compared the relative effects of a programmed technique with the traditional teacher-directed technique for initial instruction in the forehand and backhand drives of tennis. The Dyer Wallboard and the Broer-Miller tests were administered to four classes of college-age women prior to and following seven 50-minute instructional periods of forehand and backhand drives. The two control classes consisting of forty-five students (N = 22 and 23)

received the traditional teacher-directed technique of instruction while the experimental classes totaling forty-six students (N = 22 and 24) received programmed instruction.

Comparison of the pre- to posttest changes relative to achievement and teaching technique indicated more gain in performance levels by the experimental group though both groups showed significant gains at the .001 level of significance on both tests.

In a similar study Neuman and Singer (10) compared traditional and programmed techniques of learning tennis. Two all-male beginning tennis classes were used as subjects for their study. Both classes met twice a week for a seven-week period of instruction. One class was designated to receive the programmed technique and the other received the traditional technique of teaching.

The Hewitt Revised Dyer Backboard Tennis Test was used as the dependent variable in pre- and posttesting. At the end of the seven-week experimental period no significant difference between the groups was indicated.

Kulcinski (8) reported a study comparing the effectiveness of formal and informal techniques of teaching university freshmen fundamental muscular skills. Students in four tumbling classes were used as subjects in this study. The techniques of instruction for each class were as follows: in the formal class all activity was done as a class unit on command or at the suggestion of the instructor; in the informal class all activity was done through individual help

and suggestions; in a combined technique class all activity was done in a day-by-day alternation of formal and informal techniques; and in the control class all activity was done by the students without any instruction.

The results were based upon the average number of exercises learned per student for the course of instruction. The informal technique resulted in an average of 9.10 exercises learned per student. The combined technique resulted in an average of 8.13 exercises learned per student. The formal technique resulted in an average of only 7.90 exercises learned per student.

Vannier and Fait (13) have associated the direct technique of teaching with the command technique. The direct technique subscribes to exacting control of student behavior and presents a highly disciplined appearance. It assigns students to the role of obeying commands and treats them as if they were all of equal ability. Furthermore, they consider it to be a very ineffective technique in that student activity time is often poorly spent waiting in lines for an opportunity to try a skill.

Included in their comparisons, however, Vannier and Fait associate the indirect technique with the task technique of teaching. The emphasis in this technique is upon discovery, understanding and the development of the cognitive process. The inclusion of cognitive development--learning to think--in the indirect or task technique indicates its superiority relative to effectiveness.

Indicated in this review was the superiority of the task (informal, indirect or programmed) technique of teaching over the command (traditional, teacher-directed, formal or direct) technique. The command technique, however, is still used frequently in teaching beginning tennis. Apparently more conclusive research comparing these two techniques of teaching is needed.

Summary

In this chapter a review of literature related to the volley and ground-stroke methods of teaching beginning tennis was presented. Also included was a review of the literature related to command and task techniques of teaching.

The methodology specific to this study is presented in Chapter III.

CHAPTER III

RESEARCH METHODOLOGY

Introduction

Chapters I and II presented a statement of the problem and a review of related literature. This chapter presents the selection and classification of the subjects, selection and description of the tests and the administration of the tests.

Selection and Classification of the Subjects

Ninety-seven students enrolled in four beginning tennis activity classes at Western Kentucky University were used as subjects for this study. Thirty-nine subjects were male and fifty-eight were female.

A questionnaire and the pretest scores were used to identify these ninety-seven students as beginners. Beginning status was defined as having had no previous instruction in tennis.

The pretest scores were used to classify the subjects, already separate by being four intact groups, into four treatment groups. Average group scores from the four groups were compared providing information that directed random assignment of the specific methods of instruction to groups

of similar ability.

Two of the four classes were to receive the volley method of instruction. The other two classes were to receive the ground-stroke method of instruction. For classification of treatments, the two classes with the highest pretest score averages were randomly assigned to receive the volley and ground-stroke methods of instruction. The other two classes with lower pretest score averages were likewise randomly assigned to receive the volley and ground-stroke methods. The teaching techniques, command and task, were randomly assigned to each of the classes after the method of instruction had been determined.

The 8:00 A.M. class was assigned to receive the Ground-Stroke Method, Command Technique treatment. The 10:25 A.M. class was assigned to receive the Volley Method, Task Technique treatment. The 11:40 A.M. class was assigned to receive the Volley Method, Command Technique treatment and the 12:50 P.M. class was assigned to receive the Ground-Stroke Method, Task Technique treatment.

Selection and Description of the Tests

The dependent variables used were the Broer-Miller Forehand-Backhand Drive Test (2) and the Scott-French Revision of the Dyer Wallboard Test (11). These particular tennis tests were chosen due to their established validity and reliability.

Two tests were used to nullify the possibility that a particular teaching method might favor the development of the skills needed in one test more than those needed in the other.

The Broer-Miller Forehand-Backhand Drive Test is a measure of ground-stroke strength and accuracy or the ability to place drives in the back court. The Dyer Wallboard Test is a measure of the ability to rally the ball with forehand and backhand drives. In a study by Fox (5) these tests received a combined validity coefficient of .81. The Broer-Miller test alone received a validity coefficient of .79. Barrow and McGee (1) reported both tests as having reliability coefficients of .80.

The administration of the Broer-Miller Forehand-Backhand Drive Test required one regulation tennis court, a tennis racquet, a rope, 15-20 tennis balls in good condition, pencils and score cards (Appendix C). Two lines were drawn across the court 10 feet inside the service line and 9 feet outside the service line and parallel to it. Two lines were drawn across the court 5 feet and 10 feet respectively outside the baseline and parallel to it. Numbers were placed in the center of each area to indicate its scoring value. A rope was stretched 4 feet above the top of the net. The specific court markings and point values of each area of the court was standard for each testing station (Appendix A).

The subject taking the test stood behind the baseline, bounced the ball to himself, hit the ball and attempted to place it in the back 9 feet of the opposite court. Each subject was allowed fourteen trials with the forehand and fourteen trials with the backhand. In order to score the point values designated in each area, the balls had to go between the top of the net and the rope. Balls which went over the rope scored one-half the value of that area in which they landed. If the subject missed the ball in attempting to strike it, it was considered a trial. Let balls were taken over. Each ball hit between the net and the rope was scored 2-4-6-8-6-4-2, depending upon the area in which it landed. The total score was the sum of fourteen trials with the forehand and fourteen trials with the backhand.

Prior to testing, each class was randomly divided into five groups. Group I took the test from behind the baseline. Groups II and III noted and recorded the scores. Group IV retrieved tested balls and relayed them to Group V which returned them to containers placed along the baseline near Group I.

The administration of the Scott-French Revision of the Dyer Wallboard Test required per station two racquets, 10-12 tennis balls, wall space 10 feet high and 20 feet wide, floor space 20 feet wide and 35 feet deep, a net line drawn along the 20-foot wall, 3 inches in width to be included in a 3-foot distance above the floor, and a 20-foot restraining line $27\frac{1}{2}$ feet from the wall and parallel to it. Court and

equipment specifications were standardized for each testing station (Appendix B).

The subject taking the test stood behind the restraining line holding a racquet and two balls. On the signal from the instructor/timekeeper, "Ready, Go!," a ball was put into play by bouncing it and stroking it against the wall. The rally continued for 30 seconds, using any stroke desired, with the objective of getting as many hits as possible. If the ball got out of control, another one was started in the same manner in which the test was started. Balls hit short of the restraining line or which landed below the 3-foot line did not score but sometimes helped to keep a rally going. After the initial bounce to start a rally, the ball could be hit on the volley or after any number of bounces. The subject could get two more tennis balls from the racquet face whenever they were needed to keep a rally going. The extra balls were placed on a racquet face at the left end of the restraining line at each testing station.

Three 30-second trials were given to each subject. The score was the total number of hits for all three trials. A legal hit had to land above the 3-foot line on the wall and be contacted from behind the $27\frac{1}{2}$ -foot restraining line.

Five testing stations were constructed for this test. Prior to testing, each class was randomly divided into five groups, filling the testing stations with at least four subjects in each group. Subject I took the test. Subjects II and III noted and recorded the scores. Subject IV

retrieved and returned stray balls to the racquet face located on the restraining line.

Administration of the Tests

Following three days of orientation to the tennis course, specific instructions for each test were presented to the four classes on their fourth day of class. The instructions included the purpose of the tests, conduct expected and necessary during testing, specific procedures for taking each test to include knowledge of how to begin each test, how long each test would last, how to score, how to record the scores, when to stop each test and what each subject was to do while not being tested. Included with these instructions was a demonstration of the procedures of each test provided by graduate assistants of the Department of Physical Education and Recreation. Both the Dyer Wallboard and the Broer-Miller Drive tests were administered on the outdoor courts at Western Kentucky University.

The Dyer Wallboard test was administered on the fifth and sixth days of class. A 100-foot backboard along the baseline fence of two of the courts provided sufficient space for five testing stations. Prior to the arrival of the first class for testing, the required 10-foot height of the wallboard was checked, the 3-inch net line was constructed 3 feet above the ground for the full length of the backboard and the $27\frac{1}{2}$ -foot restraining line was drawn with chalk. Each 20-foot station was marked off by a vertical line on

the wallboard and the second racquet holding 10-12 extra tennis balls at the left end of the restraining line.

Upon arrival of each class for testing, instructions and procedures for taking and scoring the Dyer Wallboard Test were reviewed. The subjects were then randomly divided into five groups with a minimum of four subjects per group.

The instructor/timekeeper allowed each group of subjects taking the test two minutes of warm-up time immediately preceding their first trial of their first test. After the first group of subjects ($N = 5$) finished three 30-second trials, the rest of the class followed by rotating duties within each group. The warm-up time was provided for each subject. The commands of the instructor were constant throughout the tests. Between each 30-second trial a 30-second rest period was allowed for the subjects being tested. During this time the instructor called for the scores to be recorded and for the racquet faces at each station to be filled with extra tennis balls. Following each subject's third or final 30-second trial, the instructor called for the scores to be recorded and for rotation of duties within each group until each subject had taken the Dyer Wallboard pretest.

After completion of the Dyer Wallboard Test by each subject in each class the Dyer Wallboard testing procedure was repeated in identical order and form. This provided two pretest scores from this dependent variable. The purpose for administering two Dyer Wallboard pretests was to control for any learning effect and increase the validity of the

pretest scores. The mean of the two pretests was computed and used as the data indicating the pretest skill level of each subject.

The only discrepancy in the preceding description of the Dyer Wallboard pretest procedure was caused by the absence of thirteen subjects on the first day of testing. These thirteen subjects took both Dyer Wallboard pretest measures on the second day of testing.

The Broer-Miller Drive Test was administered on the seventh and eighth days of class. One court was used for the pretest administration of the Broer-Miller Drive Test. Prior to the arrival of the first class for testing, the court was marked off according to the specifications provided by Barrow and McGee (1). Traffic cones with numerical signs were used to indicate the value of the designated court areas. The rope was fastened to extensions of the net posts 4 feet above the full length of the net. The net height was secured at 3 feet. Two buckets were filled with tennis balls and placed near the baseline. The score cards and pencils were placed near the service line extended on the marked area of the court.

Upon arrival of each class for testing, instructions and procedures for taking and scoring the Broer-Miller Drive Test were reviewed. The subjects were then randomly divided into five groups.

The procedures of the Broer-Miller Drive Test called for the subjects to take the test, score the test, and rotate

positions on their own. The instructor, however, served as a supervisor over the five self-functioning groups.

Group I took the test first. Two members of each group took the test simultaneously. Each subject was allowed six warm-up strokes on both forehand and backhand drives. The test followed consisting of fourteen trials with the forehand and fourteen trials with the backhand. Groups II and III, recording the scores, would indicate to the subject being tested when their trials were complete. After all the members of Group I had completed the test, all the groups rotated positions and duties. Group I assisted Group II with recording the scores. Group III began retrieving the tested balls and relaying them to Group IV which returned them to the buckets as Group V took their warm-up strokes and began their first Broer-Miller Drive pretest.

After completion of the Broer-Miller Drive Test by each subject in each class, the Broer-Miller testing procedure was repeated in identical order and form. This provided two pretest scores from this dependent variable. The purpose for administering two Broer-Miller Drive pretests was to control for any learning effect and increase the validity of the pretest scores. The mean of the two pretests was computed and used as the data indicating the pretest skill level of each subject. The two pretest scores provided by both the Dyer Wallboard and the Broer-Miller Drive tests concluded the pretest administration.

After thirteen 45-minute class periods of instructional treatment the Broer-Miller Forehand-Backhand Drive Test was given on the first day of posttesting. On the following two days the Dyer Wallboard Test was given as a posttest, thus reversing the order in which the tests were given as pretests.

Summary

This chapter presented the research methodology of this study. The selection of the subjects and the selection and description of the tests were included. The administration procedures of the tests were described and the classification of the subjects into treatment groups were presented.

A presentation and analysis of the data, discussion, conclusions and recommendations will be provided in Chapter IV.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA, DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

Introduction

The previous chapters have provided a statement of the problem, a review of related literature and the research methodology used in the proceedings of the study. This chapter includes a description of the data, a statement of the statistical hypotheses, a presentation of the statistical treatment of the data, a discussion and statement of the conclusions and recommendations for further study.

Description of the Data

The two dependent variables described in Chapter III produced pre- and posttest raw scores for each of the ninety-seven subjects. These raw scores were sent to the Data Processing Center at Western Kentucky University for statistical analysis using the I.B.M. 370 Model 165 Computer.

The statistical analysis provided pre- and posttest mean scores and standard deviations of each treatment group for both dependent variables. Figure I presents a summary of the pre- and posttest mean scores and standard deviations for each treatment group for the Dyer Wallboard Test.

The Ground-Stroke Method/Command Technique (GSM/CT) treatment group produced a Dyer pretest mean score of 25.15 with a standard deviation of 8.3. A posttest mean score of 33.0 with a standard deviation of 8.6 was reported.

The Ground-Stroke Method/Task Technique (GSM/TT) treatment group produced a Dyer pretest mean score of 23.25 with a standard deviation of 8.3. A posttest mean score of 32.68 with a standard deviation of 10.67 was reported.

The Volley Method/Command Technique (VM/CT) treatment group produced a Dyer pretest mean score of 24.46 with a standard deviation of 5.0. A posttest mean score of 35.96 with a standard deviation of 6.9 was reported.

The Volley Method/Task Technique (VM/TT) treatment group produced a Dyer pretest mean score of 21.42 with a standard deviation of 7.0. A posttest mean score of 33.37 with a standard deviation of 8.0 was reported.

Figure II presents a summary of the pre- and posttest mean scores and standard deviations for each treatment group for the Broer-Miller Forehand-Backhand Drive Test.

The Ground-Stroke Method/Command Technique treatment group produced a Broer-Miller pretest mean score of 84.54 with a standard deviation of 29.45. A posttest mean score of 81.31 with a standard deviation of 26.0 was reported.

The Ground-Stroke Method/Task Technique treatment group produced a Broer-Miller pretest mean score of 73.18 with a standard deviation of 28.9. A posttest mean score of 87.0 with a standard deviation of 26.9 was reported.

FIGURE I

SUMMARY OF
MEAN SCORES AND STANDARD DEVIATIONS
OF THE FOUR TREATMENT GROUPS
ON THE DYER WALLBOARD TEST

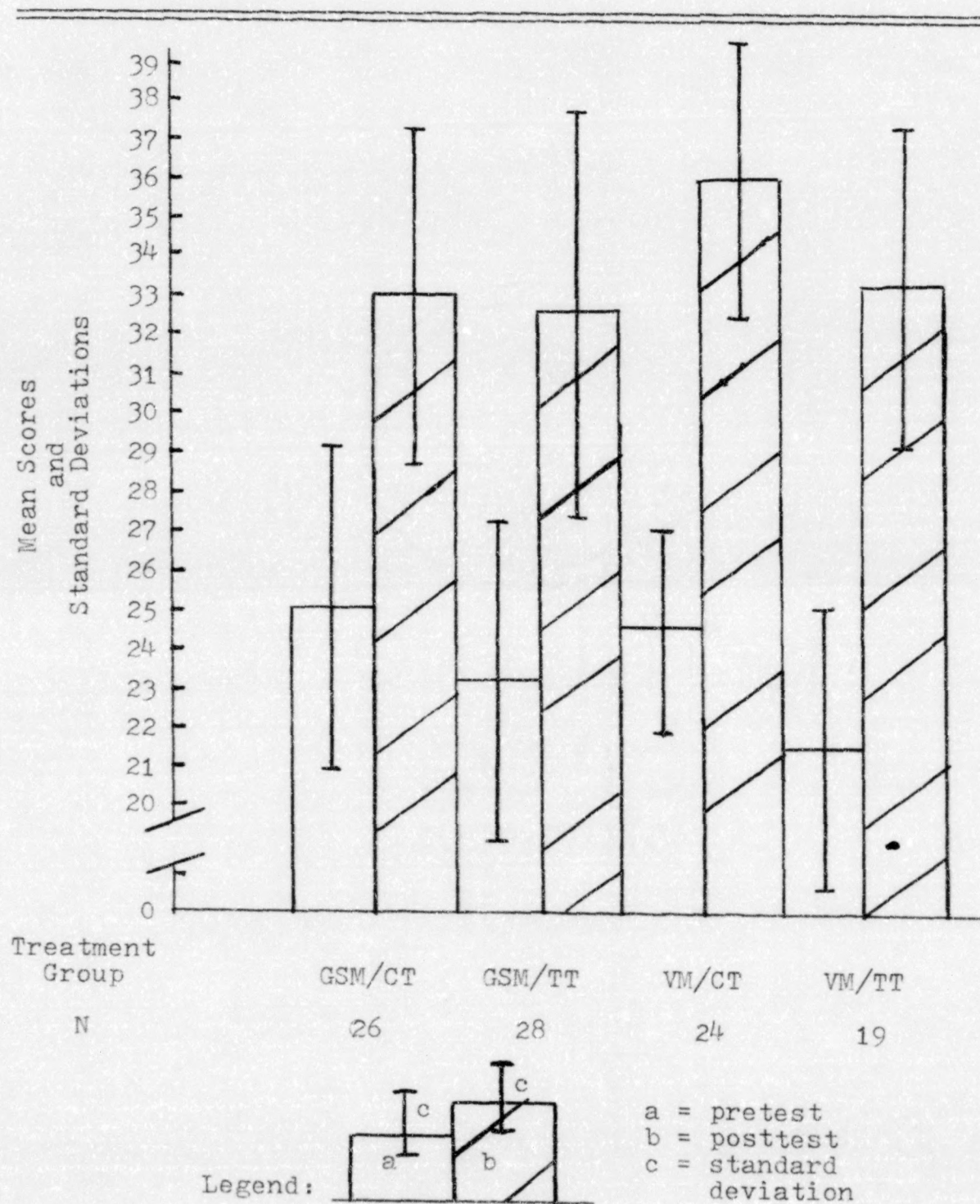
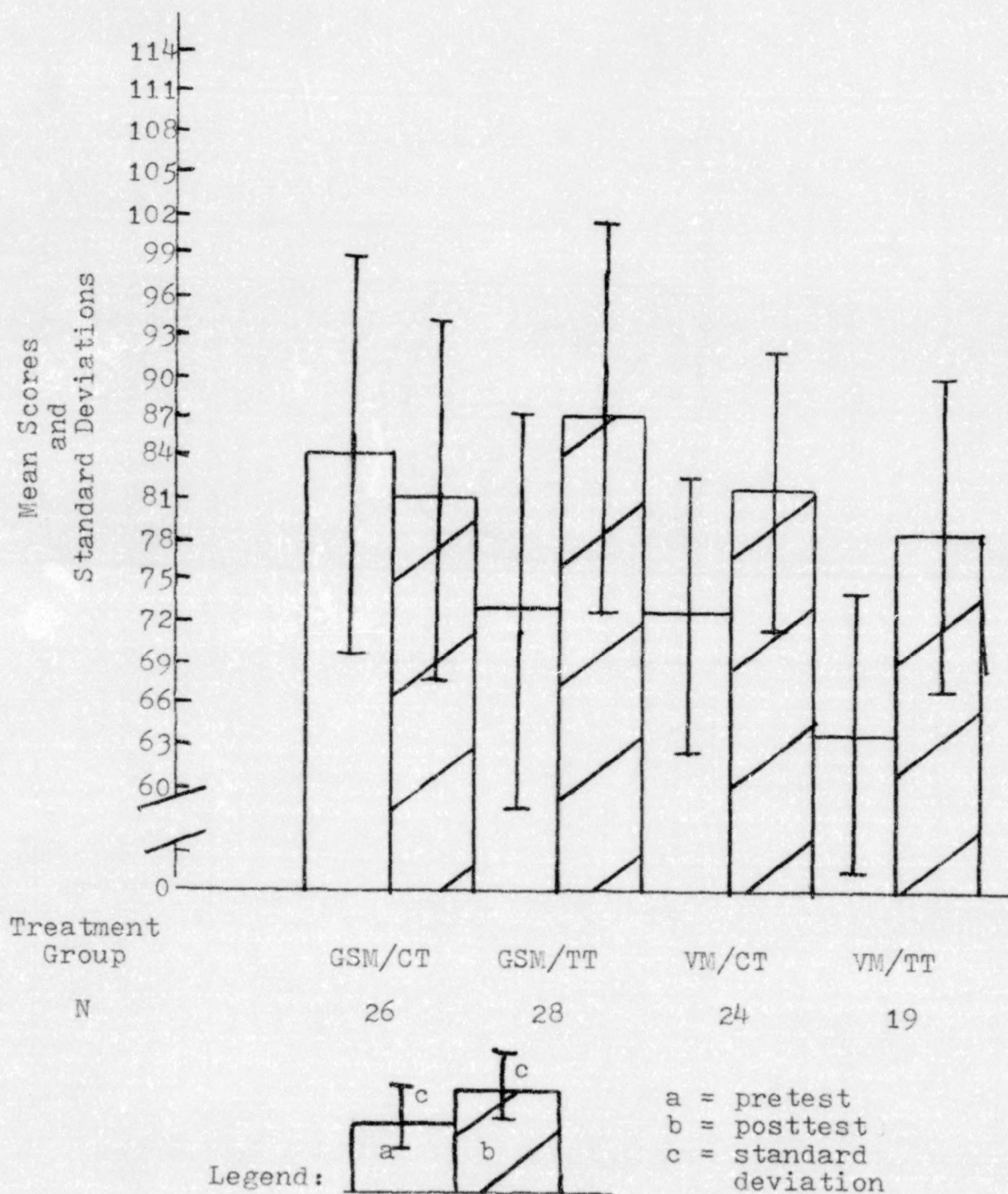


FIGURE II

SUMMARY OF
MEAN SCORES AND STANDARD DEVIATIONS
OF THE FOUR TREATMENT GROUPS
ON THE BROER-MILLER DRIVE TEST



The Volley Method/Command Technique treatment group produced a Broer-Miller pretest mean score of 72.88 with a standard deviation of 20.7. A posttest mean score of 82.29 with a standard deviation of 20.6 was reported.

The Volley Method/Task Technique treatment group produced a Broer-Miller pretest mean score of 63.95 with a standard deviation of 20.6. A posttest mean score of 79.1 with a standard deviation of 21.9 was reported.

Statement of the Statistical Hypotheses

Hypothesis 1. There is no statistically significant difference in the mean skill achievements of the subjects taught by the ground-stroke method and the subjects taught by the volley method when measured by the Dyer Wallboard Test.

Hypothesis 2. There is no statistically significant difference in the mean skill achievements of the subjects taught by the ground-stroke method and the subjects taught by the volley method when measured by the Broer-Miller Forehand-Backhand Drive Test.

Hypothesis 3. There is no statistically significant difference in the mean skill achievements of the subjects taught by the command technique and the subjects taught by the task technique when measured by the Dyer Wallboard Test.

Hypothesis 4. There is no statistically significant difference in the mean skill achievements of the subjects taught by the command technique and the subjects taught by the task technique when measured by the Broer-Miller

Forehand-Backhand Drive Test.

Hypothesis 5. There is no statistically significant interaction effect on the mean skill achievement between the two treatment variables when measured by the Dyer Wallboard Test.

Hypothesis 6. There is no statistically significant interaction effect on the mean skill achievement between the two treatment variables when measured by the Broer-Miller Forehand-Backhand Drive Test.

Statistical Treatment of Data

Statistical analysis of the data consisted of an examination of the mean skill achievements between the subjects receiving the treatment variables for both dependent variables. A two-way analysis of covariance was computed to test the significance of pretest and posttest mean skill achievements of the subjects receiving the treatment variables for both dependent variables. The pretests were used as the covariate, adjusting for the effects of the initial level of skill of the subjects as measured by the pretests. The .05 level of significance was set as the criterion value for rejection or acceptance of the hypotheses. Since two dependent variables were used, the data provided by each were treated separately and therefore is presented separately.

Table I presents a summary of the analysis of covariance relative to the Dyer Wallboard Test scores. There was no significant difference between techniques or significant

TABLE I

SUMMARY OF
ANALYSIS OF COVARIANCE OF MEAN SKILL ACHIEVEMENT
MEASURED BY THE DYER WALLBOARD TEST

Source of Variation	df	MS	F	P
Method	1	221.86	9.14	.003
Technique	1	22.14	.91	.342
Interaction	1	7.86	.32	.571
Error (within)	92	24.26		

TABLE II

SUMMARY OF
ANALYSIS OF COVARIANCE OF MEAN SKILL ACHIEVEMENT
MEASURED BY THE BROER-MILLER DRIVE TEST

Source of Variation	df	MS	F	P
Method	1	404.06	1.72	.193
Technique	1	1726.95	7.34	.008
Interaction	1	682.00	2.90	.092
Error (within)	92	235.14		

interaction effect of the variables based upon group mean skill achievement after adjusting for initial level of skill as measured by the pretest. There was a significant difference at the .05 level of significance between methods of teaching.

Table II presents a summary of the analysis of covariance relative to the Broer-Miller Forehand-Backhand Drive Test scores. There was no significant difference between methods or significant interaction effect of the variables based upon group mean skill achievement after adjusting for initial level of skill as measured by the pretest. There was a significant difference at the .05 level of significance between techniques to teaching.

In Tables I and II the statistical analysis indicates two variables showing significant differences. The methods are reported as being significantly different using the Dyer test. The techniques are reported as being significantly different using the Broer-Miller test. The statistical analysis, however, did not directly indicate the specific method or technique that was more effective for either dependent variable.

To identify which method or technique the analysis had computed as significantly more effective, mean scores for subjects receiving the same method or technique treatments were computed. A pretest and a posttest mean score for all the subjects receiving the ground-stroke method were computed using the Dyer test data. Likewise, a pretest and a posttest mean score for all the subjects receiving the volley

method were computed. A pretest and a posttest mean score for all the subjects receiving the command technique were computed using the Broer-Miller test data. Also, a pretest and a posttest mean score for all the subjects receiving the task technique were computed. These mathematical computations provided the data illustrated in Figures III and IV.

Figure III presents an analysis of the effectiveness of the ground-stroke and volley methods of instruction. A comparison of the pretest and posttest means identifies the volley method as being more effective than the ground-stroke method.

Figure IV presents an analysis of the effectiveness of the command and task techniques of instruction. A comparison of the pretest and posttest means identifies the task technique as being more effective than the command technique.

Based upon the statistical analysis of data, the following conclusions relative to the hypotheses were supported.

Hypothesis 1, was rejected. There was a statistically significant difference in the mean skill achievements of the subjects taught by the ground-stroke method and the subjects taught by the volley method when measured by the Dyer Wallboard Test.

Hypothesis 2, was accepted. There was no statistically significant difference in the mean skill achievements of the subjects taught by the ground-stroke method and the subjects

FIGURE III

SUMMARY OF
ANALYSIS OF THE EFFECTIVENESS OF
METHODS OF INSTRUCTION

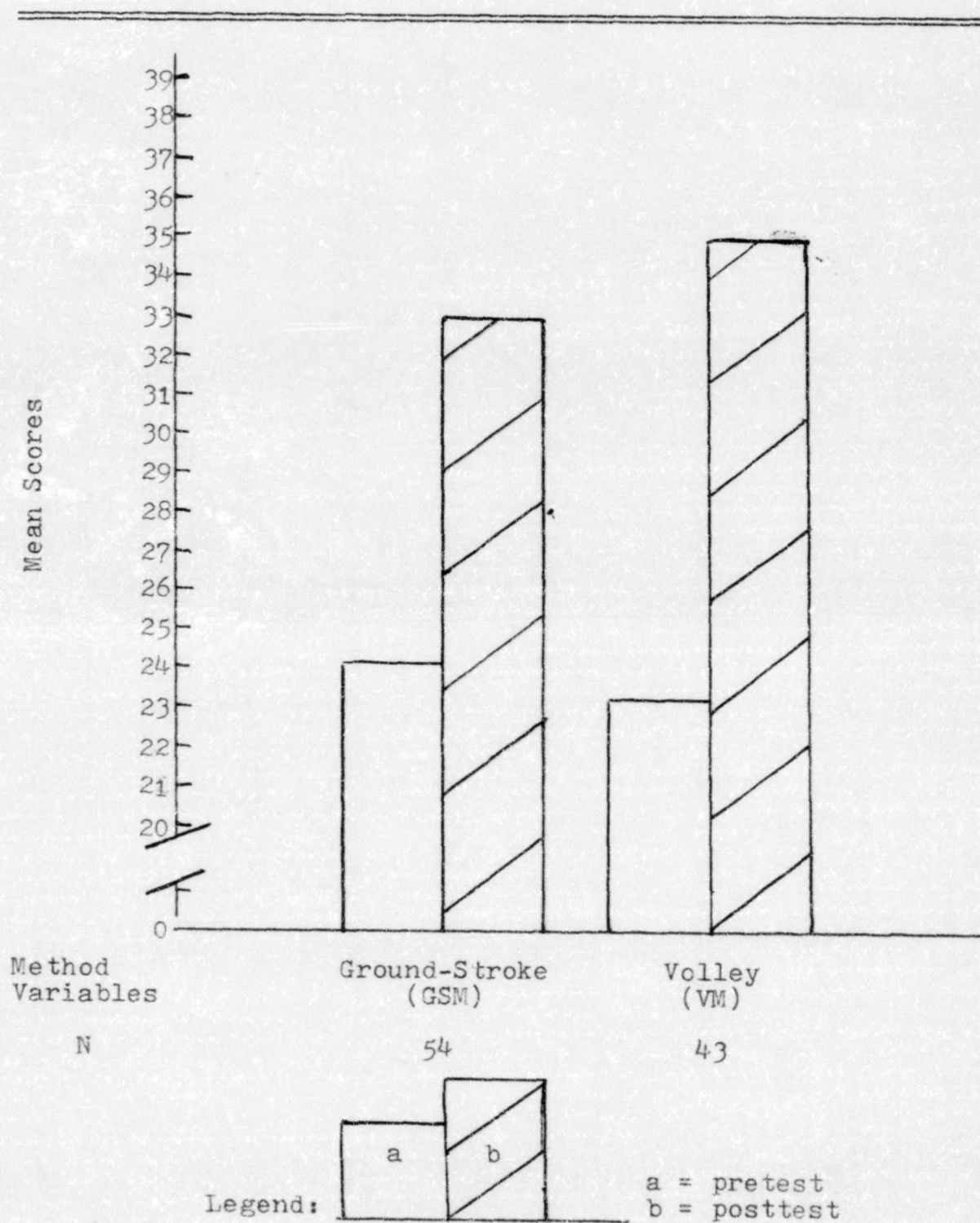
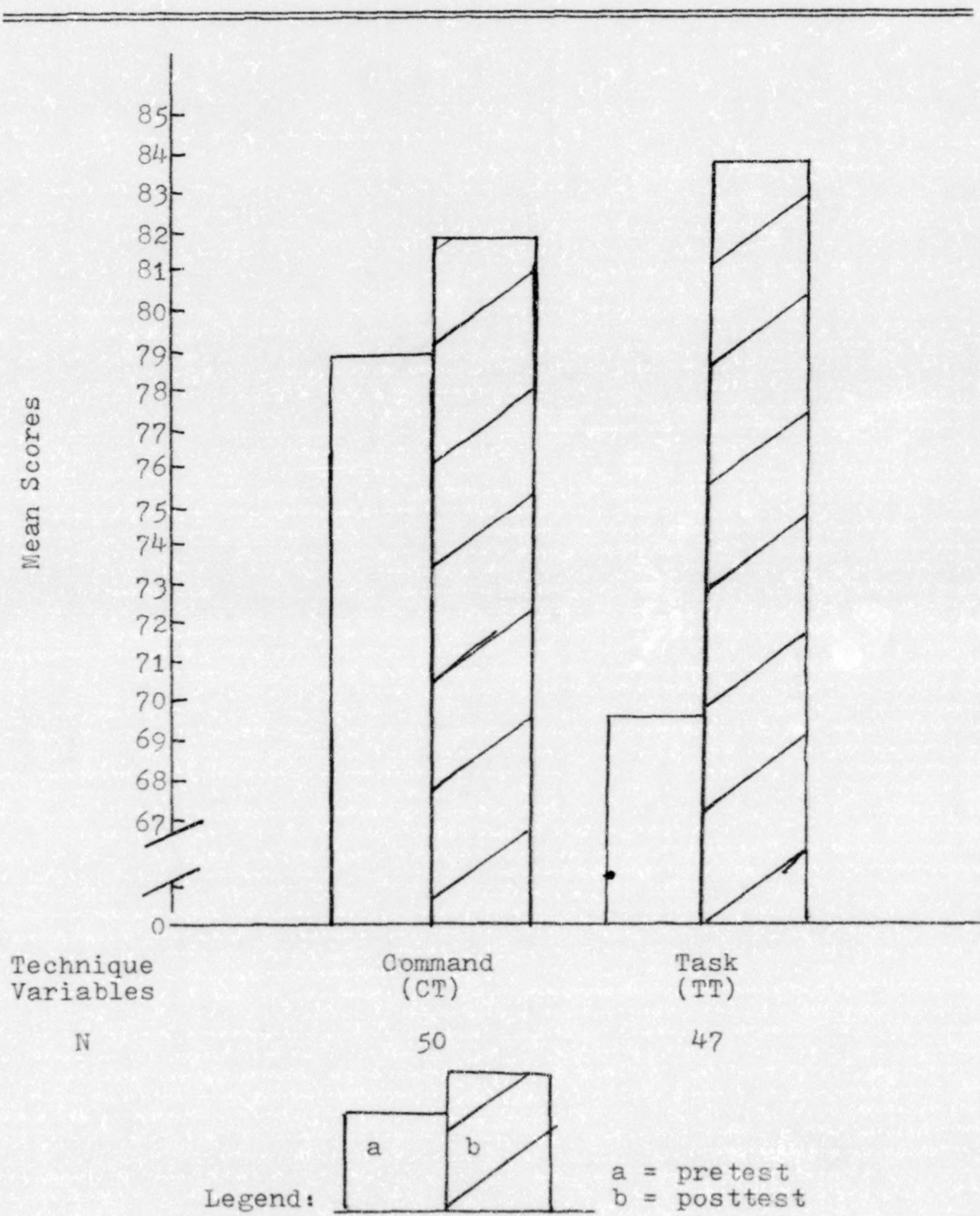


FIGURE IV

SUMMARY OF
ANALYSIS OF THE EFFECTIVENESS OF
TECHNIQUES OF INSTRUCTION



taught by the volley method when measured by the Broer-Miller Forehand Backhand Drive Test.

Hypothesis 3, was accepted. There was no statistically significant difference in the mean skill achievements of the subjects taught by the command technique and the subjects taught by the task technique when measured by the Dyer Wallboard Test.

Hypothesis 4, was rejected. There was a statistically significant difference in the mean skill achievements of the subjects taught by the command technique and the subjects taught by the task technique when measured by the Broer-Miller Forehand-Backhand Drive Test.

Hypothesis 5, was accepted. There was no statistically significant interaction effect on mean skill achievement between the two treatment variables when measured by the Dyer Wallboard Test.

Hypothesis 6, was accepted. There was no statistically significant interaction effect on mean skill achievement between the two treatment variables when measured by the Broer-Miller Forehand-Backhand Drive Test.

Discussion

An examination of this study relative to the comparison of the ground-stroke and volley methods supports the contention that the volley method is a very practical alternative in teaching beginning tennis. Furthermore, the indicated comparisons of the command and task techniques support the

contention that the task technique, as much related literature suggests, is a more effective technique than the command technique of teaching.

The beginning tennis instruction provided by the instructor throughout the course of the study, regardless of method or technique specified, produced highly significant ($P < .05$) scores depicting skill development in all groups except for one. The pretest mean score of 84.54 for the Broer-Miller test and the posttest mean score of 81.31 indicated negative achievement for the ground-stroke/command technique group. A rationale for this discrepancy is that the posttest scores of this group which met at 8:00 A.M. were affected by poorer performances of the subjects due to unseasonably cold weather (38° F) during the posttest.

On the basis of the related literature and the results of this study, it appears that both the ground-stroke and volley methods and the command and task techniques are effective for the teaching of beginning tennis. It is indicated however, that the volley method is a more effective method of teaching when the emphasis of instruction is upon the development of the students ability to rally. A similar qualification of the results of this study indicates the task technique as the most effective technique of teaching when the instructional emphasis is upon the development of strength and accuracy of ground-strokes or the ability of a student to place drives in the back court.

Conclusions

Within the limitations and design of this study, an examination of the results support the following conclusions: (1) if the emphasis in teaching beginning tennis is upon the development of the ability to rally the ball as tested by the Dyer Wallboard Test, the volley method is the most effective teaching method, (2) if the emphasis in teaching beginning tennis is upon the development of strength and accuracy of ground-strokes or the ability to place drives in the back court, as tested by the Broer-Miller Forehand-Backhand Drive Test, the task technique is the most effective teaching technique, (3) there is no combination of method and technique which is more effective than another combination.

Recommendations for Further Study

The results and limitations of this study form a basis for the following recommendations for further study.

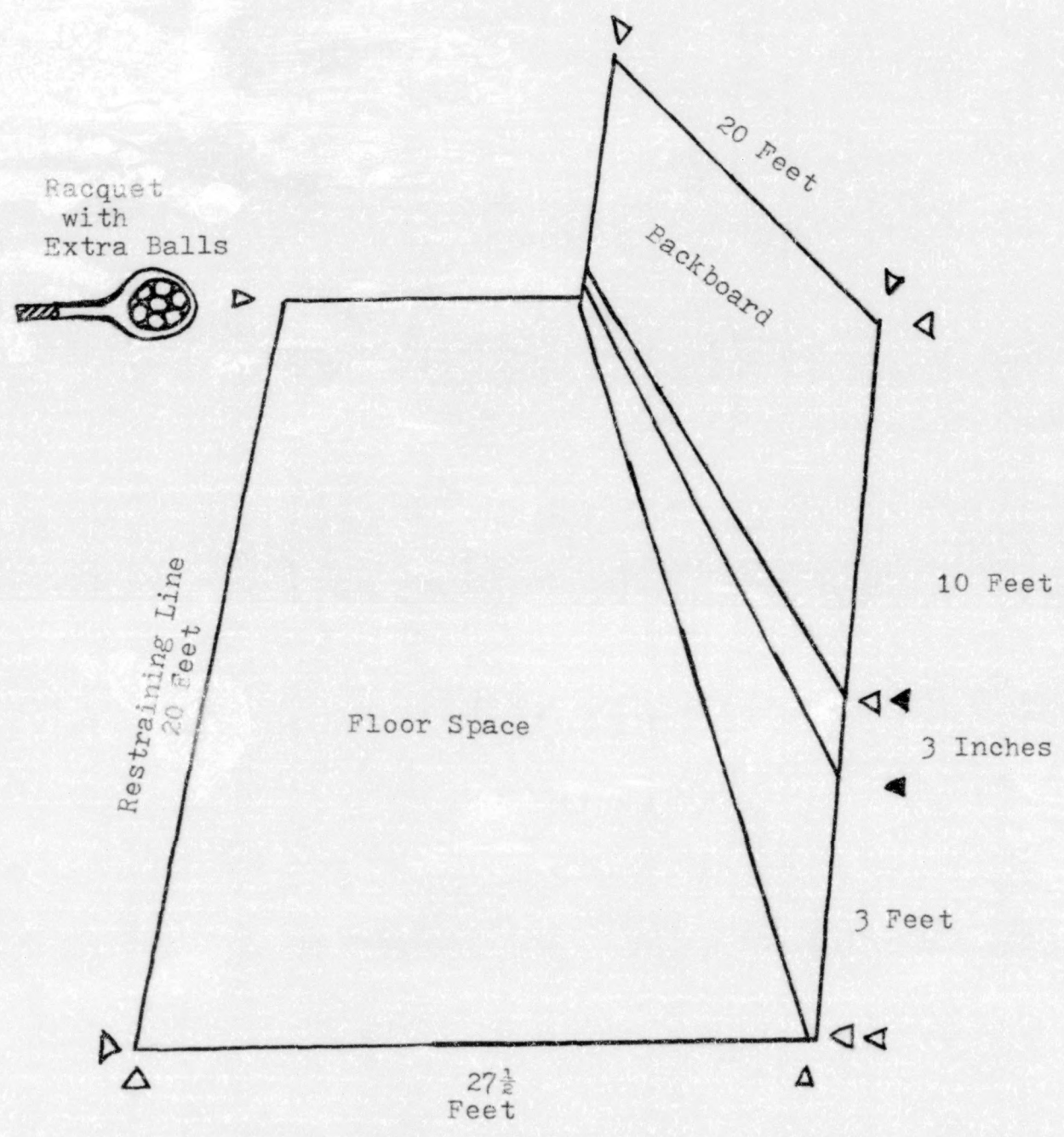
1. Would a similar comparative study using a larger sample size be of value?
2. Would a similar comparative study conducted during a sixteen week course of instruction be of value?
3. Would a similar comparative study using different dependent variables or a combination of different dependent variables and those used in this study be of value?
4. Would a similar comparative study that used random sampling for selection of subjects rather than intact groups be of value?

5. Would a similar comparative study using only male or only female subjects be of value?

6. Would a similar comparative study in that indoor facilities are provided to decrease the limitations created by weather be of value?

APPENDIX A
SPECIFICATIONS FOR
THE
SCOTT-FRENCH REVISION OF THE DYER WALLBOARD TEST

SPECIFICATIONS FOR
THE
SCOTT-FRENCH REVISION OF THE DYER WALLBOARD TEST



APPENDIX B
SPECIFICATIONS FOR
THE
BROER-MILLER FOREHAND-BACKHAND DRIVE TEST

APPENDIX C
DYER WALLBOARD
AND
BROER-MILLER FOREHAND-CACKHAND DRIVE TEST
SCORE CARDS

DYER WALLBOARD SCORE CARD

NAME _____ DATE _____

CLASS _____

	TEST 1	TEST 2
WALLBOARD TEST, TRIAL NUMBER... 1.	_____	_____
2.	_____	_____
3.	_____	_____
TOTAL.....	_____	_____
T-SCORE.....	_____	_____

BROER-MILLER FOREHAND-BACKHAND DRIVE SCORE CARD

NAME _____ DATE _____

CLASS _____

TEST 1		TEST 2	
FOREHAND	BACKHAND	FOREHAND	BACKHAND
_____	_____	_____	_____

TOTAL OF
14 TRIALS

TOTAL OF 28 FOREHAND AND
BACKHAND DRIVES

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