

A COMPARISON OF ATTITUDES OF TENTH GRADE
GIRLS PARTICIPATING IN A "REQUIRED"
PHYSICAL EDUCATION PROGRAM

By

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PREFACE

Research concerning attitudes of physical education students is a common interest of all physical educators. It is a problem which is difficult to analyze because of the instability of attitudes. It is hoped that many will benefit from this study by trying to meet the needs and wants of the most important component in teaching, the students.

I wish to express my appreciation to Miss Valerie Colvin, who enthusiastically, as always, encouraged me to do this study. Most important, I would like to express my gratitude to my advisor, Dr. Aix B. Harrison, whose guidance, patience, knowledge, and understanding served as a continual inducement to prepare this thesis.

Also, I would like to thank Mary Bonner for her typing excellence.

Finally, I wish to express my deep indebtedness to the members of my family who made many sacrifices so that I might gain this worthwhile experience.

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CHAPTER I

INTRODUCTION

In 1966 the Oklahoma State Committee on the Improvement of Physical Education recommended that all senior high schools be required to offer one full year's course in physical education. It was required that this be taken either in the ninth or tenth grade.¹

In the public school system in Tulsa, Oklahoma, the 1967 requirement for physical education was two semesters each year, grades one through ten. This requirement was decreased in 1968 to one semester in high school by substituting one semester of driver's education provided the student was fifteen and one half years of age. Since 1956 the requirement in physical education in Tulsa has steadily dropped from a three-year requirement to two semesters or one semester with the substitution of driver's education for one semester.

At Central High School in Tulsa participation in all activities in the physical education program was required unless the student had been excused by a doctor from the swimming activity or from the entire program. The principal also held the position to excuse some students from dance activity because of religious beliefs.

¹Physical Education in Oklahoma K-12, The State Committee on the Improvement of Instruction in Physical Education of the Oklahoma Curriculum Improvement Commission, 1966, p. 2.

There have been many studies concerning attitudes in physical education which will be discussed later. However, in 1966 the Tulsa Public School Research Department conducted follow-up studies on 2,019 students who were graduated in 1960² from five Tulsa high schools. In 1968 a similar study was conducted on 4,085 students who were graduated from nine Tulsa high schools in 1967.³ All students in the 1960 class were asked to respond to questions about the activities during their post high school years and evaluate their high school education. All 1967 graduates were asked to respond to questions about the activities during their post high school years. A random sample of 320 of the 1967 graduates were also asked to evaluate their high school program. The responses in both cases indicated that a very low percentage of students would take additional courses in physical education and even fewer would re-take the courses they had taken in physical education.

These responses or attitudes have caused much concern to the physical educators in the Tulsa area. Although the need for physical education is known, it is difficult to recognize exactly what caused the development of the negative attitudes. Physical education being required with no consideration for body build, skill level, or preference for one activity over another was one evident possible reason for a poor evaluation of the program. Although there were many other

²The Class of 1960 Final Composite Report Follow-Up Study of Tulsa Public High School Graduates, Directed by the Research Department, Tulsa Public Schools, Tulsa, Oklahoma, 1966, p. 1.

³The Class of 1967, A Follow-Up Study of the Graduates of the Tulsa Public Schools, Conducted by the Research Department, Tulsa, Oklahoma, 1968, p. 1.

reasons why negative attitudes might have prevailed, the writer chose the hypothesis that the requirement of participation in all activities was the principal cause for this problem. This study was then undertaken on students currently enrolled at Tulsa Central High School to see if attitudes toward their physical education program could be improved through some choice of activity.

Statement of the Problem

The purpose of this study was to determine if an attitude change occurred in tenth grade girls taking a "required" physical education program, if the students were allowed some choice in the selection of activities. The sub-problems were:

1. To determine the nature of attitudes of girls toward physical education upon entering high school.
2. To organize a feasible working schedule for choosing physical education activities by semester and hour of the day according to the particular characteristics of the program at Central. These included; number of teachers, number of facilities, equipment, level of interest and skill of students, needs of the students, and number of teachers and facilities available at class hours, one through six.
3. To determine to what extent mental-emotional, psychological-physical, social, and general values were being developed or discouraged according to the Wear Attitude Inventory.

Hypothesis of the Study

This study was designed on the basis of the following hypothesis:

The attitudes of tenth grade girls participating in a "required" physical education program with some choice of activities will be different from the attitudes of girls in the same "required" physical education program without any choice of activities.

Importance of the Study

Education, in general, seems to represent an effort on the part of society to modify habits. How well the problems of tomorrow are met by youngsters is becoming the prime responsibility of the teacher. There is some belief that the development of skills, attitudes, resources of mind and character, and, in short, the individual represent the hope of continued progress. This responsibility makes the need for understanding youth and their attitudes essential. Sometimes in physical education we accept that we are instilling social, physical, and emotional values as by-products from teaching facts, principles, and skills. Facts, principles, and skills seem to be more easily taught and less time consuming than teaching helpful attitudes or correcting false ones. But is the job being done? Are positive attitudes being developed with the teaching methods or is change necessary? Is a required program without choice of activities meeting the needs of the students and developing attitudes which might motivate the students to try to meet their needs?

The poor evaluation of the Tulsa physical education program by its former students indicated that the students saw little need for the

physical education program during their school years and were unable or uninterested in using any of the activities after they were graduated. Since these students were given no choice to select activities according to their interests, it was possible that they developed no carry-over value and lacked understanding and appreciation for physical education which in turn created negative attitudes.

Remmers presented evidence that high school students over the country basically share the opinions held by adults on public education.⁴ Also, Laurence Lipsett stated that parents, regardless of their social class, contributed to the capacities and skills of the child, the type of job the child will choose, and their values and goals.⁵ This research has given cause for concern if we acknowledge that our students will someday be adults and parents.

According to Nancy J. Mista's thesis concerning attitudes of college women toward their high school physical education program, those who enjoyed their high school physical education had more favorable attitudes than those who did not enjoy their high school physical education.⁶ Keogh studied attitudes of men and women toward benefits of physical education. One of his conclusions was that successful school programs must contribute to the development of positive attitudes

⁴H. H. Remmers., Introduction to Opinion and Attitude Measurement, Harpers and Brothers, New York, c. 1954, p. 410.

⁵Laurence Lipset, "Social Factors in Vocational Development", The Personnel and Guidance Journal, Vol. 40, no. 5, pp. 432-37.

⁶Nancy J. Mista, "Attitudes of College Women Toward Their High School Physical Education Program", Research Quarterly, vol. 39, no. 1 March 1968, p. 166.

towards continued active participation.⁷ Also, in a study by Kappes which will be discussed more completely later, it was suggested that carry-over attitudes toward activities could be more readily developed if there were more opportunities for satisfaction in physical education skills.⁸

Dr. Kenneth Cooper states in his book, Aerobics, that heart disease is increasing among women and that inactivity probably shares the responsibility.⁹ In fact, cardiovascular deaths accounted for fifty-five per cent of the fatalities in the United States in 1968 for men and women.¹⁰ There were more than fourteen million people who suffered from cardiovascular disease, of which one million deaths occurred.¹¹ The writer is not trying to suggest that positive attitudes will cause a drop in heart disease. However, if developing positive attitudes is necessary for carry-over value in physical education; then, if just one individual, through the enthusiastic efforts of a physical education teacher, becomes an adult interested in healthy exercise, the effort has been worthwhile.

If the students since 1950 showed discontent with the physical education program in Tulsa, it was possible that their children and

⁷Jack Keogh, "Extreme Attitudes Toward Physical Education", Research Quarterly, vol. 34, March 1963, p. 27.

⁸E. E. Kappes, "Inventory to Determine Attitudes of College Women Toward Physical Education and Student Services of the Physical Education Department", Research Quarterly, vol. 25, December 1954, p. 429.

⁹Kenneth H. Cooper, M.D., M.P.H., Major, USAF Medical Corps, Aerobics, c. 1968, p. 84.

¹⁰Cooper, p. 119.

¹¹Cooper, p. 119.

future generations may also react negatively to questions concerning attitudes toward their physical education program because of influence of adults and parents. This could create a continual cycle of negative attitudes and inactive and unhealthy adults.

Other evidence from Remmers states that attitudes can be changed.¹² It was hoped that if there was a positive result in this study, it would aid other physical educators or administrators in the future to organize their physical education program so that activities could be chosen or selected. In this way positive attitudes could replace negative attitudes in the future.

Limitations of the Study

In measuring attitudes, the opinions or expressed attitudes of the individual are measured. It is difficult to measure attitudes accurately because an attitude can be influenced by elements other than the one being used at the time of testing. This could cause the attitude to change. For example, the student's home life could have changed causing his attitude to change towards school. There are cultural forces which could have caused a change, such as, social agencies and foundations, religious and racial groups, literature, travel, television, friends, sex, and attitudes of parents. Also, teacher attitudes consisting of better or lack of understanding or emphasis or lack of emphasis on objectives in class could have caused a change. Interests, appreciation, motives, morality, morale, ideas, complexes, values, prejudices, fears, sentiments, loyalties, ideologies, the individual's self-concept,

¹²Remmers, p. 6.

maturation level, and his character all enter in forming an attitude or changing one already formed. To make the problem more complex, each experience, even if the same for different individuals, may have affected one individual and not the other.

Another limitation was that the classes with some choice experienced a change of teachers each nine weeks while the classes with the "required" program were taught by the same teacher all year. According to the master's thesis by Janet Tomlinson concerning attitudes of junior and senior high girls towards physical education, more positive attitudes prevailed for students with permanent staff.¹³

At Central the influence of change could have been the entrance of the student into high school since high school in Tulsa begins with the tenth grade. Maturation, difference in facilities, change of activities or the individual's own needs and wants at the time could have influenced the student's attitude toward physical education. A negative effect may have been produced because choice of activities was limited. This was due to limited facilities and the availability of only three teachers. Also, the study might have been more valid if the students had been able to select the hour during the day for the activity of their choice.

Assumptions of the Study

Four assumptions were made in this study. First, that attitudes acquired toward physical education were not caused by anything other

¹³Janet Tomlinson, "Attitudes of Junior and Senior High School Girls Toward Physical Education in Laboratory Schools", Completed Research in Health, Physical Education and Recreation, item 183, p. 63, 1964-1965.

than their experience in physical education at Central. Second, that the quality of teaching by each of the three teachers was the same. Third, that the Wear Attitude Inventory (Form A and Form B) was a valid and reliable instrument for measuring the attitudes of the subjects. And fourth, that the Wear Attitude Inventory was easily understood by the pupils and that they answered the items honestly.

CHAPTER II

REVIEW OF RELATED LITERATURE

There has been a vast amount of literature in journals of psychology, sociology, education, and political science dealing with attitudes. In order to develop positive attitudes the physical education teacher should have a general knowledge of how and what causes the formation of attitudes.

From birth and possibly before birth the individual acquires his first attitudes.¹⁴ Change brought about by environmental contact causes the individual to take these first attitudes and exhibit his first learned behavior which becomes his personality. The attitudes of the infant toward his parents will carry over to those outside his family group as he grows. His social attitudes, cooperativeness, selfishness, dominance, and conformity will become more definite and as experience expands, these will become incorporated into his personality. His attitudes will be modified as he learns and he will acquire attitudes like those of his parents, friends, and the other primary groups of which he is a member. The closer the relationship between the individual and others, the greater will be the power of such relationships in the formation of attitudes.

Attitudes may initiate many responses in physical education.

¹⁴Remmers, p. 5.

According to Remmers the term "attitude" is a convenient way of referring to the preparedness for that which exists within the organism for some activity.¹⁵ Attitudes may vary from individual to individual and from intensity to intensity. They are evolved from association with a child's family group, with children in his recreational and school group, and in general, through social-psychological interaction. The attitudes toward the individual's world and toward himself have become central, not only in social psychology, but in other applied areas as counseling, psychotherapy, advertising, and public relationships. More and more emphasis is being placed on guidance in the classroom. Teachers should not isolate themselves from guidance. George E. Hill states that teaching is an individual affair in the sense that no teaching takes place unless the individual has learned.¹⁶

The use of opinion and attitude measurement in education has become very widespread. This measurement helps the pupil, parents, classroom teachers, guidance personnel, and administrators within the school system.

There are several types of attitude scales that have been used for measurement in physical education research. It is important that there is an awareness of these scales of measurement so that research studies in physical education will be further understood. Measurements which have been used include:

¹⁵Remmers, p. 5.

¹⁶George E. Hill, Management and Improvement of Guidance, c. 1965, p. 6.

1. Thurstone and Chave.¹⁷ In 1929 Thurstone and Chave developed an attitude measurement scale which consisted of arranging a series of opinions relevant to a given attitude ranging all the way from "most favorable" to "most unfavorable". The average scale value endorsed by a subject was the measure of his attitude referring to the opinion statement. The opinion statements were given to each of a large group of judges and sorted into eleven stacks on an eleven point scale. This scale was one of the sociological techniques used most extensively in attitude and opinion research since the 1930's in areas such as psychology, sociology, physical education and other areas. Thurstone defined attitude as "the degree of positive and negative affect associated with some psychological object (affect meaning feeling, like or dislike, favor or non-favor, positive inclinations or negative)".¹⁸

2. Likert's Scale.¹⁹ Another widely used scale for measuring attitudes besides the Thurstone and Chave scale was a modification of that scale because of a doubtful assumption that attitudes are distributed normally. Likert measured attitudes using standard deviation units by assigning numerical values from one to five for the responses given. In 1963 R. S. Adams compared the Thurstone and Chave Scale with the

¹⁷L. L. Thurstone and E. J. Chave, The Measurements of Attitude, 1929.

¹⁸L. L. Thurstone, "Comment", American Journal of Sociology, 1946, vol. 52; pp. 39-50.

¹⁹R. A. Likert, "Technique for the Measurement of Attitudes", Archives Psychology, 22:5-43, 1932.

Likert Scale in measuring physical education attitudes and found both to be reliable and adequate.²⁰

3. Bugental and Zelen.²¹ A test of twenty statements permitted twenty answers with a time limit to the statement "who am I?" This test has been used mainly in social psychiatry to measure self-attitudes, but has also been used in physical education to measure self-attitudes.

4. Carr Attitude Scale.²² This scale included descriptive statements on social, personal, and activity attitudes of high school girls. The eighty-four statements based on the Thurstone Scale were designed to determine the relationship between success in physical education and selected attitudes of high school freshmen girls. The scale was proved reliable and there was a direct relationship to success in physical education and the attitudes of entering high school freshman girls. Carr suggested that "if undesirable attitudes are obstacles to learning they should be removed".

5. Edgington Attitude Scale.²³ This scale is a 1968 scale similar to the Likert scale was used to measure attitudes of high school boys toward physical education. A six point scale, one to six, was assigned to an equal amount of positive and negative statements. The test was

²⁰R. S. Adams, "Two Scales for Measuring Attitudes Toward Physical Education", Research Quarterly, vol. 34, no. 1, 1963, p. 91.

²¹James F. T. Bugental and Seymour L. Zelen, "Investigation into the Self-concept", Journal of Personality, vol. 18, 1950, p. 483.

²²Martha Carr, "The Relationship Between Success in Physical Education and Selected Attitudes Expressed by High School Freshman Girls", Research Quarterly, vol. 16, October 1945, p. 191.

²³Charles W. Edgington, "Development of an Attitude Scale to Measure Attitudes of High School Freshmen Boys Toward Physical Education", Research Quarterly, vol. 39, no. 3, October 1968, p. 505.

given many times to randomly selected freshman high school boys and the same group tested again to see if attitudes were consistent. After revisions and deletions 66 statements were selected from 117 statements by a jury and the validity of the test was established by comparing results of students' answers. The answers were consistent over a period of time of three weeks. The majority of freshman boys had favorable attitudes toward physical education.

6. Kappes Attitude Inventory.²⁴ This attitude inventory for surveying student attitudes toward organizational and administrative services was proven to be reliable. Administrators and teachers were able to know what attitudes existed within student groups. There was a high degree of correlation between the enjoyment of certain activities and the estimated skill. Further study of the results of inventory suggested that carry-over attitudes toward activities could be more readily developed if there were more opportunities for satisfaction or achievement in the skills.

7. McGee Attitude Appraisal.²⁵ A seventy-item attitude scale constructed to appraise attitudes of administrators, teachers, parents, and students toward the competition of high school girls. Parents seemed to favor intensive athletic competition whereas teachers and administrators were far less enthusiastic. Scoring similar to the Wear Inventory was used.

²⁴Kappes, p. 429.

²⁵Rosemary McGee, "Comparisons of Attitudes Toward Competition for High School Girls", Research Quarterly, vol. 27, March, 1956, p. 60.

8. Wear Attitude Inventory.²⁶ This inventory was the most widely used attitude scale in physical education research. It consists of two equivalent thirty short-form statements constructed to determine attitude change and has been used to measure attitudes in this paper. Wear constructed the two short forms from a single scale consisting of 120 questions in an earlier study.²⁷ Charles Wang's "Criteria for Writing Attitude Statements" was used for the construction of the test.²⁸ To equate the two short term tests, Form A and Form B, and to rule out any influence through suggestion of the first response upon a subsequent response, the tests were given to 100 male freshmen. When the wording of two statements seemed to indicate that Wear was tapping approximately the same specific attitudes, the questions from the original 120 questions were placed on different forms. The forms were proved to be statistically reliable.

Scoring of responses "strongly agree", "agree", "undecided", "disagree", and "strongly disagree" was 5-4-3-2-1 or 1-2-3-4-5 depending on whether the item was worded positively or negatively. Students were asked to avoid answering undecided whenever possible. The score of the subjects made on the inventory was the sum of the scores made on the individual items under attitude categories. According to the method of scoring a high score would indicate favorable attitude toward physical

²⁶ Carlos L. Wear, "The Construction of Equivalent Forms of an Attitude Scale", Research Quarterly, vol. 26, March 1955, p. 113.

²⁷ Carlos L. Wear, "Evaluation of Attitude Toward Physical Education as an Activity Course", Research Quarterly, vol. 22, March 1951, p. 114.

²⁸ Charles K. A. Wang, "Suggested Criteria for Writing Attitude Statements", Journal of Social Psychology, vol. 3, 1932, p. 367.

education. A copy of both Forms A and B appear in Appendixes A and B.

Research of attitudes aids in understanding the principles and beliefs of youth today. It discloses their likes and dislikes, their wide range of problems, and their possible goals or lack of goals in life. It also serves as an evaluative technique in what is being done or not being done in physical education. The following is a survey of research, that has been done on attitude and opinion measurement in physical education.

Baker²⁹ (1940) in a questionnaire survey study of 1,150 girls and women between the ages of 15-25, concluded that attitudes concerning participation in physical education do not regulate participation so much as they reflect the influence of the causes which do.

Moore³⁰ (1941) in her study found college women to have a highly favorable attitude toward physical activity as means of recreation. However, the actual amount of the time spent in physical activity was low, with approximately 50 percent of the girls spending less than four hours per week. Reasons were owing to study, lack of companions, and outside work.

Nemson³¹ (1949) studied annoyances of high school boys toward physical education. He found many of the annoyances could be removed

²⁹Mary C. Baker, "Factors Which May Influence the Participation in Physical Education of Girls and Women 15-25 Years of Age", Research Quarterly, vol. 11, 1940, p. 131.

³⁰Beverly Y. Moore, "The Attitude of College Women to Physical Activity as a Measure of Recreation", Research Quarterly, vol. 12, 1941, p. 725.

³¹Edward Nemson, "Specific Annoyances in Relation to Student Attitude in Physical Education", Research Quarterly, vol. 20, 1949, p. 345.

but that most of them involved the person or behavior of the other student or the instructor.

Bell and Walter³² (1953) found in a study using the Wear attitude inventory given to female college freshman and seniors who had had physical education a positive significance between:

1. Attitude and the importance of sports and dance as part of their recreational program.
2. Attitude and enjoyment of physical education class.
3. The extent to which the instructors were interested in them as individuals and the extent to which they were motivated to continue in physical activity on their own outside of class except for freshman who had no physical education in high school.

According to what the freshman thought, a good job was being done in:

1. Developing specific skills which could be adapted for pleasure.
2. Developing friendships with other girls in class.
3. Providing activities which will be social assets to them.
4. Giving them a feeling of well-being through activity.

Freshman rated low:

1. Giving knowledge of health principles for daily living.
2. Developing in them a feeling of responsibility for others.

³²Margaret B. Bell and Etta Walters, "Attitudes of Women at the University of Michigan Toward Physical Education", Research Quarterly, vol. 24, December 1953, p. 379.

3. Giving them an opportunity to develop leadership.

The seniors rated the same things that were being accomplished as the freshman, but rated these items low:

1. Developing self confidence.
2. Feeling that activity gives an opportunity for self expression.
3. Feeling that activity courses give an understanding and appreciation of the beauty of movement.

Those who had had physical education in high school had a higher opinion than those who had none.

Broer and Holland³³ (1954) gave a questionnaire to determine to what extent the women at the University of Washington were satisfying their needs and interests. The chief reason given for not liking an activity was due to lack of success. The objectives the students most wanted were:

1. To develop skills in various sports.
2. To learn activities that can be continued outside of school.
3. To have fun.
4. To keep in good health and physical condition.

Broer³⁴ (1955) also used the Wear Attitude Inventory to measure attitudes toward physical education activity at entrance of college and

³³Marian R. Broer and Dolly A. J. Holland, "Physical Education Interests and Needs of University of Washington Women in Services Classes", Research Quarterly, vol. 25, December 1954, p. 387.

³⁴Marian R. Broer, "Evaluation of a Basic Skills Curriculum for Women Students of Low Motor Ability at the University of Washington", Research Quarterly, vol. 26, 1955, March, p. 15.

following each activity. It was revealed that as a group those with low motor ability lacked interest in physical activity which seemed to be due to lack of experience, poor instruction and unsatisfying physical education experiences leading to repeated failure and, thus, to a feeling of inferiority in any motor situation which they encountered. It was concluded that the motor ability of low ability students could be improved through instruction in a basic course.

Isenberger³⁵ (1959) used the "Who Am I?" test to compare self-attitudes of women students majoring in physical education and women physical education teachers. The self-attitudes of the women physical education teachers were higher than the women physical education majors.

Isenberger³⁶ (1959) also used the self-attitude test to measure interest and success as related to self-attitudes. Self-attitudes were not related to interest and the relationship between self-attitudes and success was not significant. The women physical education major students scored higher on interest than did women physical education teachers.

Keogh³⁷ (1962) studied attitudes toward general benefits or values of physical education and if men differed from women in attitudes. He concluded:

1. One third of the subjects did not believe that the

³⁵Wilma E. Isenberger, "Self-Attitudes of Physical Education Major Students and Women Physical Education Teachers", Research Quarterly, vol. 30, March, 1959, p. 44.

³⁶Wilma E. Isenberger, "Self-Attitudes of Women Physical Education Major Students as Related to Measures of Interest and Success", Research Quarterly, vol. 30, May 1959, p. 178.

³⁷Jack Keogh, "Analysis of General Attitudes Toward Physical Education", Research Quarterly, vol. 33, May 1962, p. 239.

values coming from physical education justified the time consumed nor that physical education should be included in every school program.

2. The possibility exists that people have positive attitudes toward physical education in spite of rather than because of the school programs.
3. If our school programs are to be successful then we must know that they contribute to the development of positive attitudes towards continued active participation.
4. Subjects did not agree that physical education was contributing to social objectives.

Another study by Keogh³⁸ (1963) using the Wear Inventory tested extreme attitudes toward physical education and if negative attitudes were related to non-participation in high school. There was no apparent difference between the high and the low group. The low group in fact was surprisingly active physically but were very critical of their high school physical education programs.

Wessel³⁹ (1964) studied 200 college women using the Wear attitude inventory and found that strength was significantly related to attitudes of college women toward physical education and physical activity. It was postulated that the lack of strength was a factor in negative

³⁸Keogh, p. 27.

³⁹Janet Wessel and Richard Nelson, "Relationship Between Strength and Attitude Toward Physical Activity Among College Women", Research Quarterly, vol. 35, December 1964, p. 562.

personal feelings resulting from repeated failure in any physical activity encountered.

Smith and Bozmouski⁴⁰ (1965) tested attitudes of college women towards warm-ups using the Likert technique of attitude measurement and found that subjects with less favorable attitudes toward warm-up did not demonstrate a significant improvement when warm-ups were given. Physical performance was improved and the general attitude towards warm-ups was favorable.

Culad⁴¹ (1965) tested the attitudes of female university students toward the physical education requirement in that university. She found that the students were interested in physical education courses whether they be required or offered as elective courses with or without academic credit. Students favored smaller physical education classes and preferred a curriculum offering a wide variety of elective physical education courses.

Moyer, Mitchem, and Bell⁴² (1966) used the Wear Attitude Inventory to determine attitudes of freshman and juniors toward the physical education program. They found that individual sports were preferred,

⁴⁰Judith Smith and Margaret Bozmouski, "Effects of Attitudes Toward Warm-Ups on Motor Performance", Research Quarterly, vol. 36, March, 1965, p. 78.

⁴¹Majella Y. Culad, "Attitudes of Women Students Toward Physical Education at the University of the East, Manila, Philippines", Urbana: M. S. Thesis, Physical Education, University of Illinois, 1965.

⁴²Lou Jean, Moyer, John Mitchem, and Mary Bell, "Women's Attitudes Toward Physical Education in General Education Program at Northern Illinois University", Research Quarterly, vol. 37, December 1966, p. 515.

that there was a need for re-evaluation of methodology and interpretations of objectives involved in teaching non-major physical education classes.

Vincent⁴³ (1967) used the Wear Inventory and found that college women expressed their appreciation of the contribution was to the psychological-physical category in the Wear Attitude Inventory. There was a significant relationship between expressed attitude and success in physical education. Those having more success had more favorable attitudes.

As discussed earlier, the follow-up studies using Tulsa, Oklahoma, high school graduates indicated that attitudes toward their physical education program were low.

According to this study the following data were collected about attitudes of the 1960 graduates in the area of physical education.⁴⁴

The most helpful course:	My least helpful course:	I would take additional courses in:	I would not retake courses in:
Boys Girls Total	Boys Girls Total	Boys Girls Total	Boys Girls Total
20 1 21	110 247 357	1 1 2	39 43 82

The 1967 Graduates were asked to respond to questions about the activities during their post high school and a random sample of 320

⁴³Marilyn Vincent, "Attitudes of College Women Toward Physical Education and Their Relationship to Success in Physical Education", Research Quarterly, vol. 38, March 1967, p. 126.

⁴⁴The Class of 1960 Final Composite Report Follow-Up Study of Tulsa Public High School Graduates, p. 13.

students were asked to evaluate their high school program. The following data were collected about the subject area of physical education.⁴⁵

	Central High				Composite			
	Would Take Additional Courses		Would Not Retake Courses		Would Take Additional Courses		Would Not Retake Courses	
	No.	%	No.	%	No.	%	No.	%
Physical Education	2	3.4	2	3.4	4	1.3	13	4.1

⁴⁵The Class of 1967, A Follow-Up Study of the Graduates of the Tulsa Public Schools, p. Table 10C.

CHAPTER III

RESEARCH PROCEDURES

The purpose of this study was to determine if a positive change would occur in tenth grade girls taking a "required" physical education program if the students were allowed some selection of the activities that would be offered.

The Wear Attitude Inventory, Form A and B, was given to fourth hour, Class X, and Fifth hour, Class Y, physical education classes at Central high school. Class X was given a limited choice of activity and Class Y was given no choice of activity. Class X consisted of seventy-one students at the beginning of the first nine weeks of the school year 1968-69. The test was administered five times to each class. Form A was given three times and Form B was given two times. Form A was given at the beginning of the first and third nine weeks and at the end of the thirty-six week period. Form B was given at the beginning of the second and fourth nine weeks.

Class X was given a limited choice of activity each nine weeks. Class X's choice consisted of: first nine weeks, Tennis or Basketball; second nine weeks, gymnastics and archery, modern dance and archery, or ping-pong, badminton and gymnastics; third nine weeks, lifesaving and archery, volleyball, games, and first aid, or advanced modern dance and archery; and fourth nine weeks, bowling, softball and golf, advanced modern dance and advanced gymnastics, or lifesaving, bowling and golf.

Class X was allowed to see the schedule of activities the first nine weeks so a choice could be made of activities selected. However, the choice was not necessary until the time of change.

Class Y was required to take all activities offered. Class Y was divided into swimming levels and each group was required one swim day, one modern dance day, and two sports days. The sports offered were: First nine weeks, basketball and tennis; second nine weeks, volleyball and gymnastics; third nine weeks, archery and gymnastics; and fourth nine weeks, bowling softball, and golf. A schedule of activities appears in Appendix D.

The only requirement for Class X was during the first nine weeks; one day of modern dance a week as an orientation and one day of swim a week for the girls who could not pass the American Red Cross combined skills on the beginner level. If they could pass the swim test they took one day of body mechanics. This requirement was only for the first nine weeks.

There were three teachers and therefore, three groups in both Class X and Class Y. Because Class X changed classes each nine weeks most of the girls also changed teachers. Class Y was with their original teacher the entire thirty-six weeks.

At the end of the first nine weeks a number of girls dropped out of school due to marriage, transfer of schools, transfer to other periods of the day, and other reasons. Class X now consisted of sixty-two and Class Y consisted of sixty-five. The girls in the study who dropped out were unable to take all requested tests. Their scores were incomplete and dropped from the data.

At the end of the second nine weeks fifteen girls from Class X and

sixteen girls from Class Y dropped out of girls' physical education to take driver's education. As already stated, driver's education could be substituted for one of two semesters of physical education. Along with other dropouts and transfers, a total of forty-three in Class X and forty-five in Class Y remained.

Twenty girls entered Class X and twenty-eight girls entered Class Y at the beginning of the third nine weeks from driver's education. They were immediately given the Wear Attitude Inventory.

At the end of the third nine weeks thirty-four remained in Class X and thirty-nine in Class Y. At the end of the thirty-six week period, thirty in Class X and thirty-one in Class Y had completed all five tests given.

The girls who were given the test were given a number corresponding with their name and are listed in Appendix E, F, G, and H with the raw data. The girls who remained in physical education throughout the thirty-six week period in Class X and Class Y will be referred to as Group I. The girls in Class X and Class Y who were only in physical education for a semester will be referred to as Group II. Those in first semester will be designated as Group IIa and those in second semester will be called Group IIb. One hundred and thirty-eight girls in total completed the required number of tests for their specific group.

After the Wear Attitude Inventory was given and scored, the thirty answers were divided positively and negatively among the four objective categories: Physical (P), Emotional (E), Social (S) and General (G).⁴⁶

⁴⁶Keogh, May 1962, p. 249.

The P, E, and S categories consisted of questions worded in such a way that the objective word was involved. The G questions were concerned with the relative values of the physical education program and participation in them. A list of these questions and their categories appears in Appendix C.

After the mean scores were found for each test for Class X and Y in Group I and Group IIa and IIb, t-ratios were computed to test for significance of difference of these means. The traditional method of computing t-ratios was used according to Underwood's Elementary Statistics.⁴⁷

In order to determine if the attitudes of the different groups were similar at the beginning of the study, the mean attitude scores were compared for the first test given to Class X and Class Y in Group I, Group IIa, and Group IIb. The t-ratios were:

1. Group I--thirty-six week period
Class X test 1 compared with Class Y test 1
2. Group IIa--first semester
Class X test 1 compared with Class Y test 1
3. Group IIb--second semester
Class X test 1 compared with Class Y test 1

The following comparisons were used in computing t-ratios for significance of difference of mean scores for each succeeding test of a particular class:

⁴⁷Underwood, Benton J, Duncan, Carl P., Taylor, Janet A., Cotten, John W., Elementary Statistics, c. 1954.

1. Group I-thirty-six week period

Class X-selection of activities

Test 1 with test 2
Test 1 with test 3
Test 1 with test 4
Test 1 with test 5

Class Y-no selection of activities

Test 1 with test 2
Test 1 with test 3
Test 1 with test 4
Test 1 with test 5

2. Group IIa-first semester

Class X-selection of activities

Test 1 with test 2
Test 1 with test 3

Class Y-no selection of activities

Test 1 with test 2
Test 1 with test 3

3. Group IIb-second semester

Class X-selection of activities

Test 1 with test 2
Test 1 with test 3

Class Y-no selection of activities

Test 1 with test 2
Test 1 with test 3

The formulas used appear in Appendix I.

CHAPTER IV

RESULTS

Considering the statistical calculations necessary, the writer computed means, standard deviations, and t-ratios for tests given to those who were allowed some choice in the selection of activities and those who were allowed no choice in selection of activities to see if any attitude change would occur. The tests were also further compared according to the amount of time the subjects participated in the program, thirty-six weeks or eighteen weeks (one semester). The semester groups were compared separately because the activities changed throughout the year.

Resulting means and standard deviations are found on Table I. The means were also graphically plotted in Tables II, III, and IV.

First of all, the mean scores of the first test given to each group were tested and no significant difference was found. Attitudes seemed to be basically the same when testing began. The t-ratios for beginning tests are found on Table V.

The largest increase in mean scores occurred between the first and the last test given to Group I, Class X, the choice class. The mean score increase was 23.27 over a thirty-six week period. The t-ratio, 6.52, was highly significant at the one percent level of confidence. There was a continual increase in the mean scores beginning with a large jump in the mean score of the second test after only nine weeks of choice.

TABLE I
MEANS AND STANDARD DEVIATIONS FOR THE
WEAR ATTITUDE INVENTORY

CLASSES	TEST	STANDARD DEVIATION	MEAN
GROUP I			
N = 30			
Class X	1	14.54	104.60
Class X	2	11.81	119.30
Class X	3	4.94	121.03
Class X	4	11.97	125.10
Class X	5	12.49	127.87
N = 34			
Class Y	1	17.76	107.38
Class Y	2	16.69	107.35
Class Y	3	17.23	112.15
Class Y	4	14.63	115.70
Class Y	5	10.34	109.29
GROUP IIa			
N = 15			
Class X	1	5.68	99.00
Class X	2	19.14	113.80
Class X	3	16.67	114.73
N = 16			
Class Y	1	13.62	102.30
Class Y	2	15.6	104.87
Class Y	3	17.71	103.2
GROUP IIb			
N = 20			
Class X	1	17.71	109.70
Class X	2	9.08	123.10
Class X	3	8.97	122.25
N = 23			
Class Y	1	18.43	114.17
Class Y	2	13.55	116.87
Class Y	3	16.10	113.87

TABLE II

MEAN SCORES OF ATTITUDE TESTS FOR
CLASS X AND CLASS Y

GROUP I

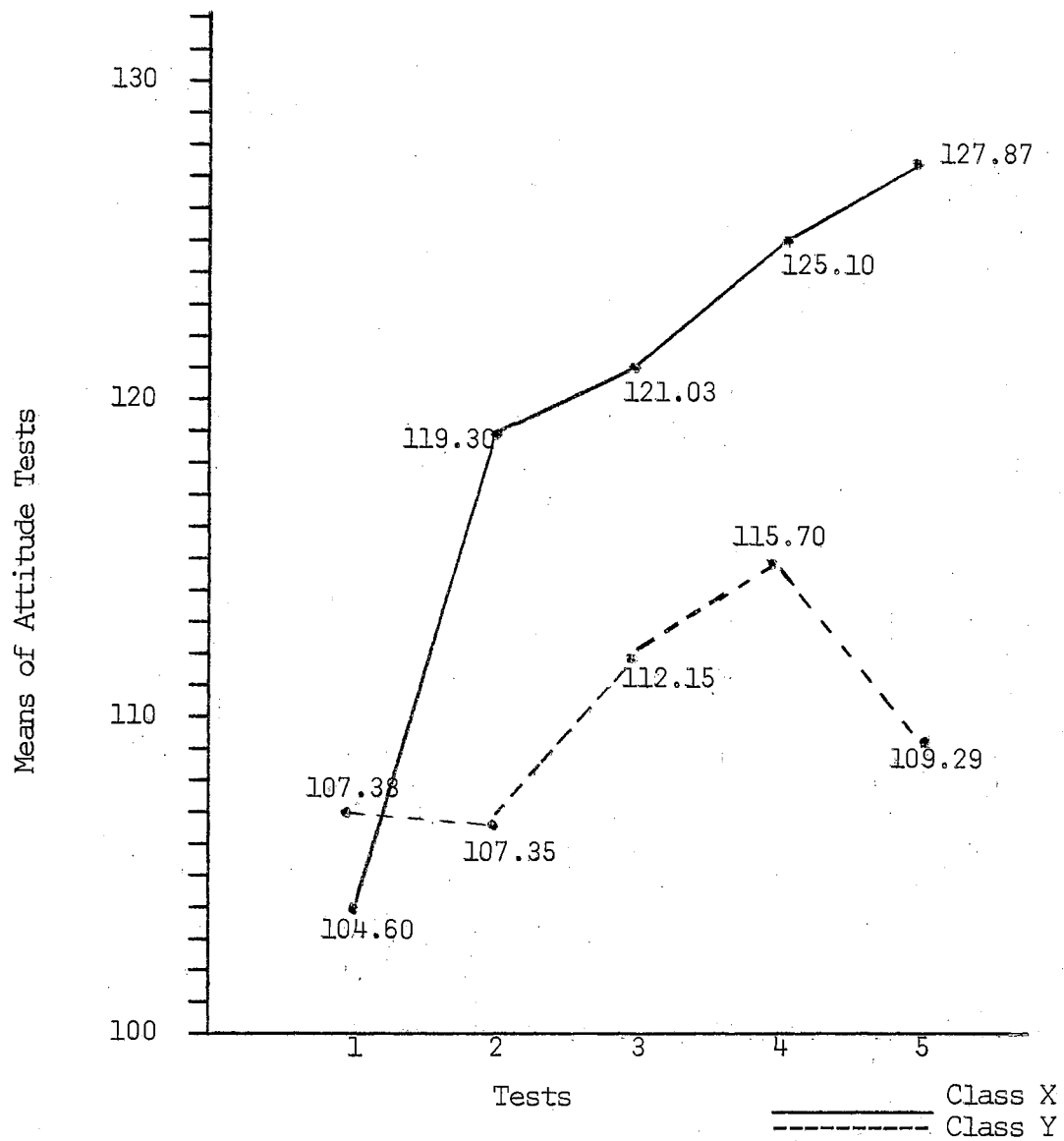


TABLE III

MEAN SCORES OF ATTITUDE TESTS FOR
CLASS X AND CLASS Y

GROUP IIa

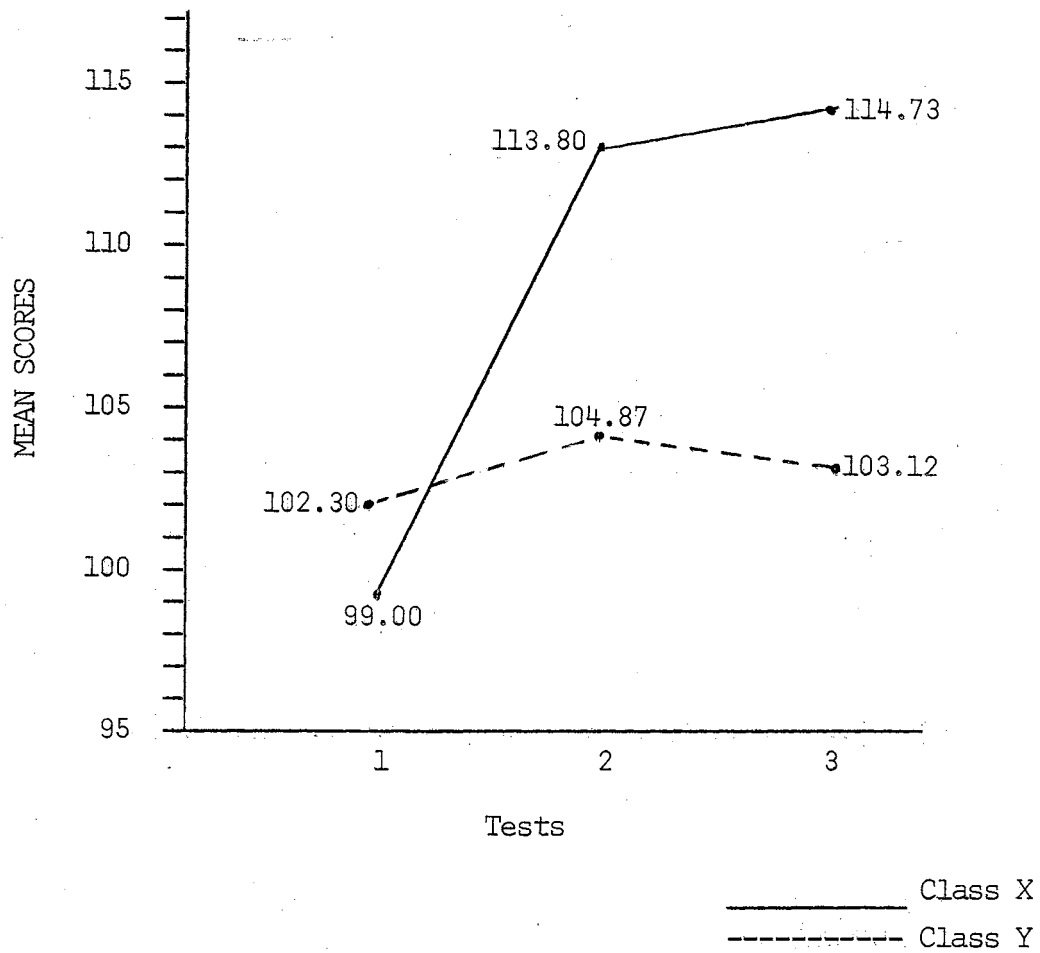
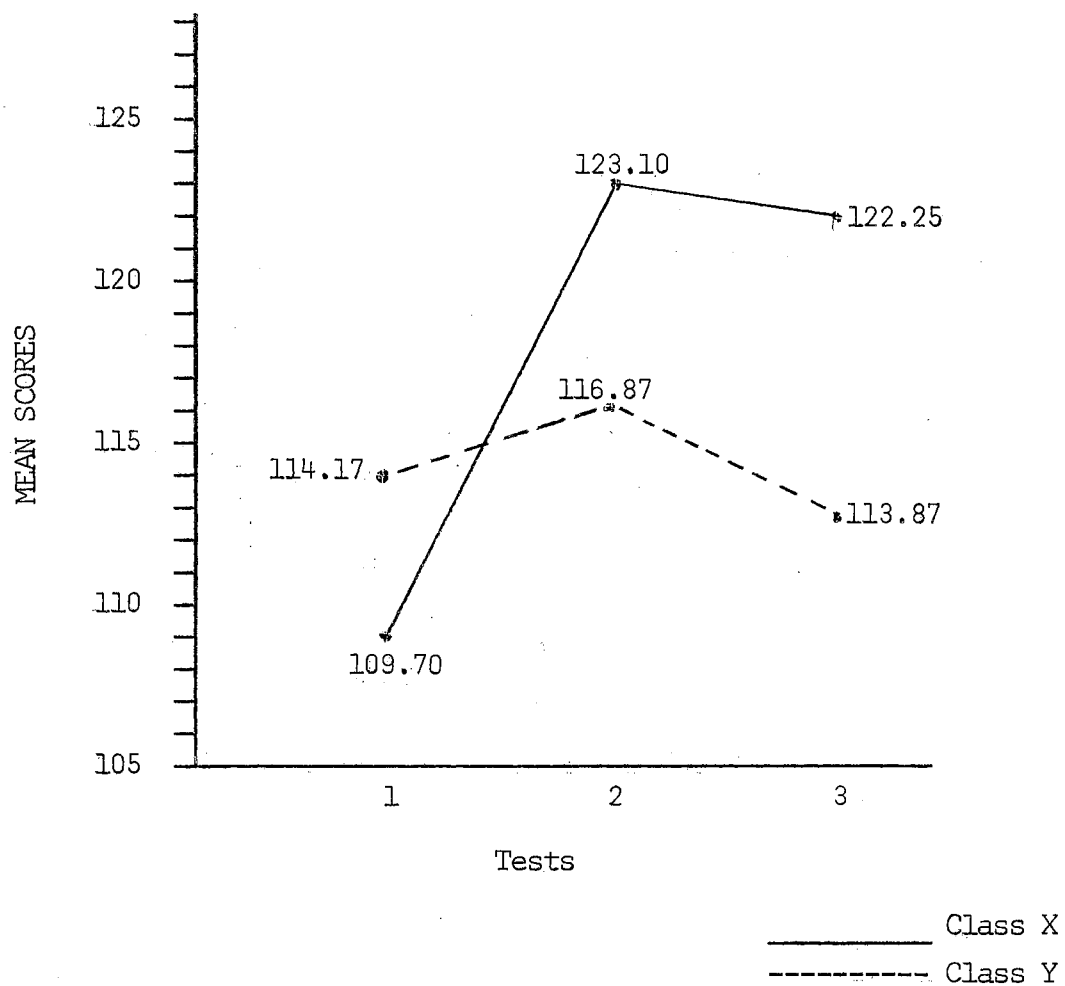


TABLE IV

MEAN SCORES OF ATTITUDE TESTS FOR
CLASS X AND CLASS Y

GROUP IIB



The scores continued to rise and the difference of each mean score from the first test was significant at the one percent level of confidence. The t-ratios were as follows: second test, 4.23; third test, 5.75; and fourth test, 5.97. This was an indication that students attitudes were highly favorable in having some selection of activities.

The group without choice of activity had no significance of difference in the mean scores with the exception of the fourth test which was significant at the five percent level ($t = 2.1$). The significance was not continued because the final test again returned to no significance of difference with a t-ratio of .53.

Significance of difference was also shown in the mean scores of the first semester, Group IIa, and the second semester, Group IIb in Class X which has selection of activity. The t-ratios were calculated between the first and succeeding mean test scores, and were as follows for Class X: Group IIa; test one with test two, 2.18; test one with test three, 3.89, and Group IIb; test one with test two, 2.94, and test one with test three, 2.74.

TABLE V

t-RATIOS OF BEGINNING TESTS

	GROUP I Class X Class Y	GROUP IIa Class X Class Y	GROUP IIb Class X Class Y
t-Ratios	.68	.63	1.1

TABLE VI

t-RATIOS FOR TEST 2,3,4 and 5 AS COMPARED
TO TEST 1 OF EACH CLASS AND
NUMBER OF SUBJECTS

	Test 2	Test 3	Test 4	Test 5	Number of Subjects
Group I					
Class X Test 1	4.23*	5.75*	5.97*	6.52*	30
Class Y Test 1	.01	1.06	2.10**	.53	34
Group IIIa					
Class X Test 1	2.18**	3.89*			15
Class Y Test 1	.34	.16			16
Group IIb					
Class X Test 1	2.94*	2.74**			20
Class Y Test 2	.57	.11			23

* Significant at the 1% level

**Significant at the 5% level

There was no significance of difference shown by t-ratios calculated for the first and second semester classes without choice of activities, Classes Y. The t-ratios were; Group IIa, test one with test two, .34, test one with test three, 1.52; and Group IIb, test one with test two, .57, and test one with test three, .11. The t-ratios for all classes are shown on Table VI.

Contributions of all physical education categories or values were expressed above seventy percent in Class X at the end of the thirty-six week period. Percentages of answers to statements for which objectives were categorized is shown on Table VII. Class X was the only class which was used to show change in attitudes toward objective categories. The first test which Class X, Group I took showed a below fifty percent score on four Emotional values; 4,23,28, and 29. Three General values, 5,12, and 24 and two Social values, 3 and 15 also fell below the fifty percent line for the beginning test. By the final test all of these objective values were improved except for the three General value statements which remained below sixty percent of the agreement responses.

TABLE VII
 SIZE OF AGREEMENT RESPONSES TO OBJECTIVES
 ACCORDING TO THE WEAR ATTITUDE
 INVENTORY FOR CLASS X,
 GROUP I

Objectives	60% or less	61-79%	80% or more	Total
General	3	4	3	10
Emotional	0	4	3	7
Social	0	2	5	7
Physical	0	1	5	6
Total	3	11	16	30

Discussion

According to this study attitudes were improved by allowing the students some choice of activity. It was further noted by the observation of three physical education teachers that there were very few discipline problems in Class X as compared to Class Y. Students seemed to enjoy participating in activities because they had chosen them. The students seemed more enthusiastic and actually easier to teach. In most

cases they became more advanced and more skilled in the chosen activity because they were more interested.

Although Tomlinson's thesis stated that a change of teacher caused negative attitudes in her study,⁴⁸ it was not so in this study. Students were able to choose the activity, but had no idea who the teacher would be. They were not allowed to choose the teacher because this was not the variable being tested.

In regard to the objective values tested, it was noted that some Emotional objectives were rather lowly scored on the first test. Students were not aware of any benefit from physical activity to the emotional state of the individual until their participation in this program, which seemed to have caused the improvement of Emotional objective scores.

There may be some question about the standard deviation of tests scores found on Table I. The change in standard deviation indicated more uniformity in attitudes on the third test for Class X. This may have been due to the activity in which this group was participating at the time. They had just completed classes in Advanced Modern Dance and Archery; Gymnastics, Badminton and Ping Pong; or Gymnastics and Archery.

Also, standard deviations indicated more uniformity in attitudes at the beginning of the testing period for Group IIa, Class X. This group dropped out to attend driver's education classes after eighteen weeks of physical education. Their score may have indicated their anticipation of a short term in physical education because as shown on Table I, the mean score on the first test for this class was very low (99.00).

⁴⁸Tomlinson, item 183.

Too, it may be noted that there was considerable variability in the scores of Class X, Group IIb. These students had just entered from driver's education classes. As they continued throughout the semester their attitudes showed more uniformity and became higher.

The three General objective statements which continued to be scored unfavorably on the final test are greatly related to the results of this study and show that further work should be done concerning attitudes about "required" physical education. Students reacted negatively to the following statements:

"12. Physical education classes provide situations for the formation of attitudes which will make one a better citizen."

"24. Physical education is one of the more important subjects in the school program."

And students agreed with this statement:

"5. I would take physical education only if it were required."

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

This study was based on the post high follow-up study done in Tulsa Public Schools in which students showed negative attitudes toward their physical education program.

It was the intention of the investigator to determine if attitudes could be improved through some choice of activity within a "required" physical education program. The sub-problems were to devise a schedule for girls who were taking a "required" program at Central high school so that they might have some selection of activities; and also, to evaluate what objectives according to the Wear Attitude Inventory were improved or not improved through this choice of activity in the thirty-six week period class.

The t-ratios were calculated to test for significance of difference between the mean scores of the tests taken by the students.

According to the results of t-ratios and other findings it was concluded that:

1. Attitudes of tenth grade girls in a "required" program were improved in this study by offering some selection of activities.
 - a. the choice group showed significant improvement of attitudes over those with no choice at the end of thirty-six weeks.

- b. the choice group showed significant improvement of attitudes over those with no choice at the end of eighteen weeks.
 - c. the choice group showed significant improvement of attitudes over those with no choice at the end of nine weeks.
2. According to the objective categories in the Wear Attitude Inventory, students at Central responded:
- a. to the Physical objective as the main contribution of physical education.
 - b. poorly to the Emotional objectives on the first test and highly on the final test.

The author recommends further attitude study in the area of selection of activities in a "required" program with a wider variety of activities from which to choose and selection of these activities according to hours or periods of the day.

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APPENDIX A

WEAR ATTITUDE INVENTORY

Form A

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
SA	A	U	D	SD

Answer all statements with the abbreviations listed under the appropriate response. Place the abbreviation in the blank in the right hand column.

1. If for any reason a few subjects have to be dropped from the school program, physical education should be one of the subjects dropped.
2. Physical education activities provide no opportunities for learning to control the emotions.
3. Physical education is one of the more important subjects in helping to establish and maintain desirable social standards.
4. Vigorous physical activity works off harmful emotional tensions.
5. I would take physical education only if it were required.
6. Participation in physical education makes no contribution to the development of poise.
7. Because physical skills loom large in importance in youth, it is essential that a person be helped to acquire and improve such skill.
8. Calisthenics taken regularly are good for one's general health.
9. Skill in active games or sports is not necessary for leading the fullest kind of life.
10. Physical education does more harm physically than it does good.
11. Associating with others in some physical education activity is fun.
12. Physical education classes provide situations for the formation of attitudes which will make one a better citizen.
13. Physical education situations are among the poorest for making friends.
14. There is not enough value coming from physical education to justify the time consumed.
15. Physical education skills make worthwhile contributions to the enrichment of living.

APPENDIX A (CONT'D)

16. People get all the physical exercise they need in just taking care of their daily work.
17. All who are physically able will profit from an hour of physical education each day.
18. Physical education makes a valuable contribution toward building up an adequate reserve of strength and endurance for everyday living.
19. Physical education tears down sociability by encouraging people to attempt to surpass each other in many of the activities.
20. Participation in physical education activities makes for a more wholesome outlook on life.
21. Physical education adds nothing to the improvement of social behavior.
22. Physical education class activities will help to relieve and relax physical tensions.
23. Participation in physical activities helps a person to maintain a healthful emotional life.
24. Physical education is one of the more important subjects in the school program.
25. There is little value in physical education as far as physical well-being is concerned.
26. Physical education should be included in the program of every school.
27. Skills learned in physical education class do not benefit a person.
28. Physical education provides situations for developing desirable character qualities.
29. Physical education makes for more enjoyable living.
30. Physical education has no place in modern education.

⁴⁹Wear, 1951, p. 125-126.

APPENDIX B

WEAR ATTITUDE INVENTORY

Form B

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
SA	A	U	D	SD

Answer all statements with the abbreviations listed under the appropriate response. Place the abbreviation in the blank in the right hand column.

1. Associations in physical education activities give people a better understanding of each other.
2. Engaging in vigorous physical activity gets one interested in practicing good health habits.
3. The time spent in getting ready for and engaging in a physical education class could be more profitable spent in other ways.
4. A person's body usually has all the strength it needs without participation in physical education activities.
5. Participation in physical education activities tends to make one a more socially desirable person.
6. Physical education in schools does not receive the emphasis that it should.
7. Physical education classes are poor in opportunities for worthwhile social experiences.
8. A person would be better off emotionally if he did not participate in physical education.
9. It is possible to make physical education a valuable subject by proper selection of activities.
10. Developing a physical skill brings mental relaxation and relief.
11. Physical education classes provide nothing which will be of value outside the class.
12. There should not be over two one-hour periods per week devoted to physical education in schools.
13. Belonging to a group, for which opportunity is provided in team activities, is a desirable experience for a person.

APPENDIX B (CONT'D)

14. Physical education is an important subject in helping a person gain and maintain all-round good health.
15. No definite beneficial results come from participation in physical education activities.
16. Engaging in group physical education activities is desirable for proper personality development.
17. Physical education activities tend to upset a person emotionally.
18. For its contributions to mental and emotional well-being physical education should be included in the program of every school.
19. I would advise anyone who is physically able to take physical education.
20. As far as improving physical health is concerned a physical education class is a waste of time.
21. Participation in physical education class activities tends to develop a wholesome interest in the functioning of one's body.
22. Physical education classes give a person an opportunity to have a good time.
23. The final mastering of a certain movement or skill in a physical education class brings a pleasurable feeling that one seldom experiences elsewhere.
24. Physical education contributes little toward the improvement of a social behavior.
25. Physical education classes provide values which are useful in other parts of daily living.
26. Physical education should be included in the program of every school.
27. Physical education should be required of all who are physically able to participate.
28. The time devoted to physical education in schools could be more profitably used in study.
29. The skills learned in a physical education class do not add anything of value to a person's life.
30. Physical education does more harm socially than good.

⁵⁰Wear, 1951, 125-126.

APPENDIX C

EMOTIONAL(E), GENERAL(G), PHYSICAL(P)
 AND SOCIAL(S) CATEGORIES OF
 STATEMENTS ACCORDING TO
 THE WEAR ATTITUDE
 INVENTORY

Form A Item	Objective Represented
1	G
2	E
3	S
4	E
5	G
6	E
7	S
8	P
9	G
10	P
11	S
12	G
13	S
14	G
15	S
16	P
17	G
18	P
19	S
20	E
21	S
22	P
23	E
24	G
25	P
26	G
27	G
28	E
29	E
30	G

APPENDIX D

SCHEDULE OF ACTIVITIES FOR CLASS X

FIRST NINE WEEKS

TEACHER	NO.	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
1	25	Modern Dance	Tennis	X	Swim or Body Mech.	Tennis
2	25	Tennis	Modern Dance		Swim or Body Mech.	Tennis
3	20	Basketball	Basketball		Swim or Body Mech.	Modern Dance

SECOND NINE WEEKS

1	15	Gymnastics	Archery	X	Gymnastics	Archery
2	9	Advanced Modern Dance	Archery		Archery	Advanced Modern Dance
3	40	Ping-Pong and Badminton	Gymnastics		Gymnastics	Ping-Pong and Badminton

THIRD NINE WEEKS

1	9	Life-saving	Life-saving	X	Archery	Archery
2	11	Advanced Modern Dance	Advanced Modern Dance		Archery	Archery
3	40	Volleyball	Volleyball		First Aid	Games

FOURTH NINE WEEKS

1	9	Life-saving	Life-saving	X	Bowling Fundamentals	Golf Fundamentals
2	40	Bowling Fund.	Softball		Softball	Golf Fundamentals
3	10	Advanced Modern Dance	Advanced Gymnastics		Advanced Modern Dance	Advanced Gymnastics

FLOATING SCHEDULE

ATTENDING CLASS FOUR DAYS A WEEK

APPENDIX E

CLASS X, GROUP I TESTS ONE

THROUGH FIVE RAW DATA

NO.	FORM A	FORM B	FORM A	FORM B	FORM A
No.	1st Test	2nd	3rd	4th	5th
1	96	108	115	128	127
2	99	114	116	116	125
3	107	131	130	129	135
4	100	134	123	121	126
5	89	107	107	111	119
6	122	129	129	127	136
7	121	125	130	142	145
8	87	109	112	108	116
9	83	108	119	125	120
10	116	127	127	127	130
11	108	134	127	150	150
12	115	121	127	130	135
13	107	115	124	133	138
14	104	128	104	128	125
15	121	138	129	133	137
16	118	116	131	134	139
17	101	125	124	123	111
18	101	107	118	116	120
19	125	131	143	121	140
20	77	97	99	99	115
21	89	109	116	129	126
22	143	144	142	138	119
23	123	134	134	138	145
24	91	122	119	133	130
25	108	122	119	120	121
26	93	106	99	106	100
27	106	113	126	130	134
28	104	105	104	95	104
29	92	104	104	129	131
30	92	116	134	134	138

APPENDIX F

CLASS Y, GROUP I, TESTS ONE

THROUGH FIVE RAW DATA

NO.	FORM A	FORM B	FORM A	FORM B	FORM A
No.	1st Test	2nd	3rd	4th	5th
1	112	108	108	99	113
2	99	104	108	99	100
3	110	109	113	122	78
4	135	93	122	132	134
5	117	119	107	132	110
6	114	117	133	128	135
7	121	137	118	122	113
8	98	111	118	114	114
9	116	118	116	117	103
10	106	113	126	115	114
11	95	93	107	103	105
12	103	107	101	114	113
13	98	112	113	114	120
14	109	142	105	96	100
15	84	121	112	109	104
16	135	108	149	148	143
17	85	113	111	119	118
18	100	108	101	79	66
19	100	90	117	118	100
20	80	81	67	79	77
21	73	73	66	107	99
22	109	113	113	130	112
23	100	88	113	114	112
24	120	122	134	136	133
25	100	89	114	124	125
26	105	101	107	118	106
27	120	121	129	121	119
28	137	137	136	125	125
29	89	91	101	112	109
30	93	110	96	114	114
31	79	73	80	102	92
32	142	92	119	118	103
33	118	127	117	117	73
34	139	109	133	137	134

APPENDIX G

TESTS ONE THROUGH THREE, RAW DATA

CLASS X, GROUP IIa				CLASS Y, GROUP IIa			
No.	1st test	2nd test	3rd test	No.	1st test	2nd test	3rd test
1	134	137	132	1	134	121	118
2	137	137	142	2	89	103	76
3	124	138	123	3	95	98	107
4	62	64	83	4	113	119	110
5	107	120	129	5	88	80	56
6	82	96	115	6	95	95	105
7	81	122	118	7	91	93	91
8	115	113	118	8	106	104	101
9	95	114	101	9	102	101	89
10	95	117	118	10	91	92	97
11	95	123	111	11	107	133	112
12	112	125	126	12	111	117	107
13	104	109	108	13	86	86	121
14	73	91	99	14	90	97	115
15	69	101	98	15	115	132	119
				16	124	107	127

APPENDIX H

TESTS ONE THROUGH THREE, RAW DATA

CLASS X, GROUP IIb				CLASS Y, GROUP IIb			
No.	1st test	2nd test	3rd test	No.	1st test	2nd test	3rd test
1	86	106	117	1	113	114	112
2	117	130	130	2	100	131	130
3	108	120	118	3	131	124	126
4	130	134	134	4	125	130	120
5	143	133	129	5	115	107	77
6	133	134	135	6	99	93	95
7	109	120	110	7	125	124	123
8	95	118	130	8	120	124	135
9	99	129	121	9	106	100	104
10	122	130	129	10	113	129	132
11	112	123	127	11	127	134	129
12	87	120	111	12	127	127	125
13	115	125	117	13	121	121	112
14	77	127	120	14	133	123	120
15	133	131	120	15	118	120	120
16	105	107	110	16	118	119	118
17	115	115	109	17	108	107	111
18	104	109	124	18	102	85	79
19	119	136	134	19	120	115	109
20	86	115	120	20	121	111	124
				21	116	128	124
				22	39	97	69
				23	129	123	125

APPENDIX I

FORMULAS USED IN COMPUTATIONS

1. Standard Deviation of each Mean

$$\sigma = \sqrt{\frac{\sum x^2}{N} - M^2}$$

2. Standard error of each Mean

$$\sigma_m = \frac{\sigma}{\sqrt{N-1}}$$

3. Standard error of the Difference

$$\sigma_{\text{diff}} = \sqrt{\sigma_{m_1}^2 + \sigma_{m_2}^2}$$

4. t-ratio

$$t = \frac{M_1 - M_2}{\sigma_{\text{diff}}}$$

⁵¹Underwood, p. 121.

VITA ^v

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Thesis: A COMPARISON OF ATTITUDES OF TENTH GRADE GIRLS PARTICIPATING
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ant at Oklahoma State University, 1964-1965, Monroe Junior
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