THE EFFECT OF INDIVIDUAL AND GROUP MOTIVATION ON PERFORMANCE IN AN ATHLETIC ACHIEVEMENT TEST OF JUNIOR HIGH SCHOOL BOYS

Thesis for the Degree of M. A.

MICHIGAN STATE UNIVERSITY
DONALD H. BAULD

1968

ABSTRACT

THE EFFECT OF INDIVIDUAL AND GROUP MOTIVATION ON PERFORMANCE IN AN ATHLETIC ACHIEVEMENT TEST OF JUNIOR HIGH SCHOOL BOYS

by Donald H. Bauld

An available sample of eighty-nine boys from Pattengill Junior High School in Lansing, Michigan was used as subjects to determine the effects of individual and team competition on performance in a Y.M.C.A. Athletic Achievement Test. The boys were in three classes each of which was tested initially with no motivational factors injected. Scores for each subject were converted to standard scores using the Neilson-Cozens classifications and tables published by the Y.M.C.A. One week later the classes were retested. One class, Group A, competed individually for trophies with the six boys improving their scores the most receiving trophies. A second class, Group B, was randomly selected as the class to be divided into teams and compete for trophies on a team basis. The six boys on the team improving its score the most over test number one received trophies. The third class became the control class and was retested with no awards promised.

The completion of test 2 terminated Phase I of the experiment. The hypotheses of Phase I as well as Phase II were that, (1) both individual and team motivated competition

groups would improve their scores significantly more than the control group and (2) that the team competition group would improve its score significantly more than the individual competition group. On completion of test two all classes were informed that they would be retested in three weeks time on the same basis as test two except that the awards in Groups A and B would be changed to an athletic achievement crest in school colors. In the ensuing three weeks twenty minutes of each daily class period were set aside for practice for all three groups. Mean scores of tests 1 and 2 (Phase I) and tests 2 and 3 (Phase II) were subjected to analysis of covariance. Results of Phase I support the first hypothesis. However, the second hypothesis was rejected at the 90% level of confidence on the basis of the findings. Phase II, involving a three-week practice period yielded different results. In it the team motivated competition group made significantly greater progress than the control group at the .05 level of significance whereas the individual motivated competition group showed no significant gains.

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A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

MASTER OF ARTS

Department of Health, Physical Education
and Recreation

1968

PREFACE

Teachers and coaches in physical education and athletics are constantly striving to improve motor performance in their students and athletes. Research and increased knowledge in the areas of biology, physiology and skill mechanics are leading to increased excellence and achievement of unprecedented heights in athletic performances.

There has been much less research completed on the psychological factors affecting motor learning and motor performance such as anxiety, emotion and motivation. It is the conviction of this writer that motivation is a very important factor in determining the extent to which individuals learn and perform in relation to their abilities. This study is essentially an attempt to discover the extent to which certain types of motivation affect motor performance.

Special thanks are expressed to Dr. Arthur Steinhaus for his advice and guidance throughout the preparation of this study. Thanks are also expressed to Mr. Ron Stauffer, Mr. Charles Jablonski and Mr. James Walker for their co-operation and assistance throughout the testing phase of this study. The investigator also extends thanks

to Mr. Gary Fisher, principal of Pattengill Junior High School, for the use of three physical education classes during the testing period.

July, 1968 D.H.B.

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CHAPTER I

INTRODUCTION

The Problem

In attempting to discover the vital factors in improving human motor performance most researchers have concentrated on areas such as muscular strength, endurance, mechanical analysis and other physiological aspects of human performers.

Recently an increased number of physical educators have been concerned with the affect psychological factors have in the area of human motor performance. In fact, it is asserted by Ikai and Steinhaus that each individual has a psychological limit as well as a physiological limit which in part determines the limits of motor performance. Ikai and Steinhaus wrote as follows on this subject:

> Physiologic factors set the relatively fixed and outermost limits, psychological factors, the more proximate ones. In this sense it is appropriate to speak of a physiologic and psychologic limit. Capacity is the always undetermined measure of the former. Performance is always limited by the latter (24, p. 157).

Educators have long realized that motivation is one of the psychological factors important in improving learning and performance. Not until recently, however, have studies been done in the field of physical education

to determine the effectiveness of various forms of motivation in pushing back the psychological barriers to increase the level of motor performance. Ulrich (54), Hurloch (23) and Strong (49) have all discovered that such factors as praise, verbal encouragement, level of aspiration and competition can result in increased motor performances.

Educators have been slow to utilize the information on motivation as it affects learning and performance. There appear to be two main reasons for this fact, the first of which is that most of the early studies on motivation were done wth animals in relation to primary drives such as hunger, thirst and sex. The second reason is that results of the attempted studies are often confusing. For example, an investigation of twenty-four studies on the effects of individual and team competition on productivity by Miller and Hamblin in 1963 (35) revealed that in fourteen of the studies individual competition resulted in greater productivity and in ten others team competition resulted in greater productivity. It is very difficult for educators to utilize research with contradictory results.

It is also highly interesting to note that the primary motivating factor in American education is individual competition for grades (7) while in Russian education the primary motivating factor is team competition

in which individual reward is dependent upon the success of a group or collective (4). It is not the purpose of this paper to investigate the relative effectiveness of American and Russian education but rather to present data on American students in an attempt to determine the relative effectiveness of individual and team competition--as motivators within our own culture. It is hoped that this study will stimulate interest in motivation on the part of physical educators and that the results will be instrumental in causing them to reassess the motivational techniques presently employed.

Statement of the Problem

The purpose of this study was to investigate the affects of two motivational techniques, individual competition and team competition on the performances of eighth and ninth grade boys in an Athletic Achievement test. The experiment was conducted in two phases. The first phase was designed to determine the affects of the motivational treatments when the subjects have not had the opportunity to practice. The second phase differs in that the subjects were informed that they would be retested so that they had the opportunity to practice.

Hypothesis

1. Subjects in both the individual competition group and the team competition group will show significant improvement over the control group receiving no competitive motivational treatment in both Phase I and Phase II.

2. The group or team motivated group will show greater improvement than the individual motivated group in both Phase I and Phase II.

Definition of Terms

Motivation.--A force, either innate or learned, which initiates the behavior of an organism.

Motive.--An internal function which impels the individual to strive to attain certain conditions that will satisfy it. Hunger and desire for recognition are examples.

Incentive.--External objects or conditions which are striven for because they are potential satisfiers for a specific motive. Food is an incentive for the hunger motive.

Individual Competition.--A situation in which the successful attainment of the desired goal by one individual hinders the possibility of others attaining the same goal.

Team Competition.--A situation in which all individuals in the team achieve the desired goal in equal amounts. The success of the individual is dependent upon the success of his group.

Limitations of the Study

1. This study was limited to eighty-nine boys from a junior high school of an essentially middle class area of a major Michigan city.

2. It was impossible to control the level of physical activity or the personal living habits of the subjects during the experiment.

3. It was necessary to use an available instead of a random sample and the situation did not permit a random assignment of subjects to treatments. Therefore, one of the assumptions of analysis of covariance used in this study, that of a random sample, was broken.

4. Results cannot be applied to countries other than the United States unless they are democratic, free enterprise countries in which competition for the fruits of the culture are competed for on an individual basis.

5. Advantages would have been gained by using a more exacting measuring device. However, the reliability coefficient of the test used was found to be .960 using the Pearson-product moment method on a test and retest of the control group.

6. It is known that the achievement motivation of each individual will affect his learning and performance. This study did not measure or allow for this variable.

7. The nature of the task, an athletic achievement test, was not particularly conducive to a group situation since it does not involve a high level of co-operation on the part of group members.

Significance of the Study

One of the main problems confronting educators today is how to motivate students to learn and perform at levels approaching their potentialities. There are many educators such as Kelly (28, p. 69) and Knapp (30) who believe that intrinsic motivation or rewards resulting from performing the particular activity itself, is the only valuable form of motivation. They believe that teachers have invented an elaborate system of reward and punishment to get students to learn and perform. They claim that these rewards and punishments are extrinsic and lie outside the task itself and impel students to work for these rewards rather than the reward inherent in successful performance of the task itself.

As is evidenced in the following chapter, however, there are a great many studies which clearly indicate the effectiveness of various motivating devices in getting students to perform and learn more efficiently. It is the writer's conviction that the prime factor in rendering a

particular activity intrinsically satisfying for an individual is successful performance of that particular activity. There is no substitute for the satisfaction derived from successful participation. Support for this conviction can be found in Thorndike's (51) law of effect and in Allport's (2) functional autonomy theory. Quoting from Thorndike: "A satisfying after effect of a connection can and generally does strengthen that connection directly, irrespective of repetitions . . . (51, p. 270)."

If there is validity in Thorndike's law of effect then it would seem logical that the use of extrinsic motivation in the form of various incentives and rewards is defendable if it leads to increased successes in the learning and performing of motor activities. Thorndike writes the following on this subject: "The repeated occurrence of a connection, in and of itself, does produce learning in the form of increased strength of that connection but this strengthening is rather slow. It is so slow that good teachers usually seek to supplement repetition by interest and reward (51, p. 170)."

Empirical observation of practicing physical education teachers shows that many forms of extrinsic motivation are utilized. In American education the basic extrinsic motivation is individual competition for grades. Coleman (7, p. 340) makes this clear when he says, in effect, that rewards in American schools are on the basis of grades and

students must compete for these on the open market with fellow students. Russian education also utilizes extrinsic motivation in the form of group competition. To quote Brofenbrenner "It is the winning unit that gets rewarded by a pennant, a special privilege or by having their picture taken in parade uniforms." (4, p. 554)

A wealth of material has been written by American psychologists and sociologists on the social-psychological benefits accruing to individuals participating in groups from group inter-action and group dynamics. Accepting these findings, it is the writer's premise that if it can be proven that team competition is as effective, or more effective, a motivator than individual competition perhaps a more widespread use of team competition would result in more educational benefits than the present system is yielding. In his article Coleman notes that the power of peer motivation is not being utilized in American education as he states that: "scholastic ability or good grades play a very unimportant part in peer acceptance." (7, p. 341) Empirically, it would seem advantageous to educate youth to encourage others in their efforts to learn and perform and in turn be rewarded by others for achievement resulting in gain not only for the individual but the group to which he belongs. The following quote by Warters illustrates the importance of research and experiment in the area of motivation, or specifically, group motivation.

> It would probably not be an exaggeration to say that the principal source of human waste--in our society, at least--lies in our failure to take advantage of group resources for increased individual motivation. (56)

The real significance of this investigation is to determine if team motivation, with its inherent concomitant value in character and social development, is as effective or more effective than individual motivation. A positive answer to this question should be of great significance to those who are seeking to motivate youngsters to learn and perform at high levels and at the same time striving for character and social development in these same youngsters.

CHAPTER II

REVIEW OF RELATED LITERATURE

Introduction

The area of motivation has been a most controversial one since recorded history. Great advances have been made since early periods in history when much of man's behavior was explained in terms of supernatural forces. However, even today there is confusion as to what causes man to behave as he does and there is no clear-cut, comprehensive theory explaining man's behavior. Brown illustrates this confusion concerning motivation when he writes:

> . . . depending on the particular author consulted, motivation can be conscious or unconscious, it can be the same as or different from drive; it may or may not guide behavior; and all motives can be either learned or instinctive." (5, p. 24)

By examining briefly three or four of the leading theorists in the area of motivation over the past forty years one can determine from where some of this confusion stems. Allport (2) explains behavior in infants as being motivated mainly by primary organic needs but later in life these motives become transformed into learned motives as the individual matures. To quote Allport on this topic "Theoretically all adult purposes can be traced back to

these seed forms in infancy. But as the individual matures the bond is broken. The tie is historical not functional." (2, p. 194)

Many of the theorists before, and shortly after, Allport explained man's behavior in terms of primary needs. The idea of explaining motivation in terms of unlearned viscerogenic drives such as hunger, thirst and sex remained prominent until the 1950's. Hull's theory is a drive reduction theory which concentrates on the organism's tissue needs which give rise to drives like thirst, hunger and sex and man's efforts to relieve himself of these needs. Hull writes that

> these primary, biological drives act like stimuli and when the drive stimulus is reduced by ingestion of food, water or the necessary satisfier we have primary reinforcement which strengthens the stimulus situation and the responses which have preceded the reduction of the drive stimulus. (21)

The most likely reason for sustained interest in the primary drives was because most experimenters were searching for answers by studying animals rather than human beings.

More modern theories of motivation are more sophisticated and contain an explanation for many of the social drives of man which are not easily explained by biological deficiencies. Maslow (34) is a modern theorist whose theory has as its base the primary need theory of Hull. However, Maslow recognized a system of secondary needs which were learned, psycho-genic needs. These secondary needs were subdivided into: (1) extrinsic motivation and

(2) intrinsic motivation. Extrinsic motivation was the result of needs resulting from a social deficiency such as affiliation, recognition and acceptance. These needs are essentially satisfied by the learned elements of co-operation and competition. Intrinsic motivation which were needs resulting from the organism's need to interact with its environment. These needs are satisfied by play, exploration and manipulation. Maslow placed these needs in a hierarchy with primary needs on the bottom and intrinsic, secondary needs on the top and hypothesized that until the lower needs of hunger and thirst are satisfied, man cannot advance to higher motives such as esteem and ultimately to the supreme motive of self-actualization. Maslow's theory is interesting and plausible but is difficult to test scientifically.

None of the above three theories have been proven in their entirety nor have attempts by other theorists to explain the concept of motivation been found entirely satisfactory. It is not the purpose of this section to try and resolve the confusion existing in theories of motivation but it is interesting to note a comment made by a modern psychologist. McClelland states that:

> The psychology of motivation is in its infancy. Until recently it has been dominated by the theoretical view that there are a few basic primary drives on which the whole structure of the complex secondary or social motives is built. (37, p. 5)

Although controversy exists as to the nature of motivation and causes of man's behavior the importance of motivation in stimulating learning and performance seems to be widely accepted by modern educators. Johnson, Steffler and Edelfelt state that:

> Motivation is an educational by-word among teachers who attempt to develop an optimum learning environment, since they recognize the importance of promoting interest and desire to learn. (25, p. 223)

Hurloch (22, p. 78) is of the opinion that although workers in the field of psychology have long since recognized the importance of introducing some form of incentive in order to obtain best results, educators have been slow in evaluating the effectiveness of different incentives that are used in dealing with school children.

Dean Ryan wrote, "The fact that certain motive incentive conditions have a marked influence on learning and performance of verbal material has been well established." (43)

Tuttle (53, p. 38) stated that motivation is the most neglected aspect in the whole field of education and that many teachers did not utilize motivation as extensively as possible. Having introduced some theories and concepts of motivation as well as its importance in the field of education I would like to present a section on the scope of motivational studies.

Scope of Motivational Studies

This section will concentrate on completed studies in motivation and its effect on learning and performance. One of the areas of motivation in which there is general agreement is the area of knowledge of results. Martin, (33) testing eighty college women on the jump and reach test with and without knowledge of results, found that performing with knowledge of results yielded significantly superior performances.

Hurloch (22) sites studies by Féré, Wright and Whiting which conclude that knowledge of results is superior to no knowledge as an incentive in learning and performance.

Level of aspiration is also an area of motive in which studies indicate a positive effect on learning and performance. Clawson (6, p. 107) in one of the very few studies done in physical education on the effects of motivation on motor learning, found that student set level of aspiration results in increased learning of archery skills by freshmen college women. Dudley (11) confirms her findings on the level of aspiration as she reports that both teacher and student set levels of aspiration result in significantly better performances by junior high school girls on the Scott Motor Ability Test.

Wilkinson (59) also finds level of aspiration to be an effective motivation on improving results on a right arm muscular endurance test by boys of ages seven to eleven.

Smith (47) reports a study in which he attempts to determine the effect of athletic success and failure on one's level of aspiration. He discovered that successful athletes raised their level of aspiration while unsuccessful athletes lowered theirs. He used fifty-nine football players as subjects in his study.

Verbal encouragement and verbal disparagement were both found to be effective motivators in boys seven to eleven on a right arm muscular endurance test conducted by Wilkinson (59).

Ulrich and Burke (54) found similar results in a study designed to determine the "encouraging" reports of success and "discouraging" reports of failure on work output and mechanical efficiency. Testing nine men and nine women on a bicycle ergometer Ulrich and Burke concluded that motivational stressors (positive and negative) illicit greater work output than when no motivational stress is present (1% level of significance). They also found that mechanical efficiency is greater when motivational stresses indicating successes are used than when no motivational stress or motivational stress induced by failure is used. They found similar results in both men and women.

Gates and Rissland (16) found similar results on a color-naming test. They found encouraging remarks more effective than discouraging remarks in increasing

performance but both were found more effective than making no remarks at all.

Hurloch's (23, p. 78) results agree with Wilkinson in that both praise and reproof are equally effective incentives for school children.

Audience is a motivational factor found to be effective by Missiuro (36) who found that the mere presence of onlookers produced an increase of from ten to forty-four per cent over solitary work output on subjects lifting weights in time with a metronome. Martin's (33) results confirm Missiuro's in her study of college women on the jump and reach test. Gates (15) on the other hand, found no significant effect of small and large audiences on subjects performing psychological tests such as the three-hole test of co-ordination.

Terrell (50) did a study comparing the effect of an immediate incentive, knowledge of results, with a delayed material incentive (candy) on the learning of a simple motor task by boys and girls ages four to nine. He found that immediate reward of correct responses was superior to a delayed or promised reward for correct responses.

Kitson (29) found that rewards themselves are effective motivators for increasing production in industry. He found that output was increased up to 78% when bonuses were offered for increases in production.

Three investigators, Strong, Hansen and Nelson, performed rather extensive motivational studies involving the relative effects of five or more motivational techniques on performance. Strong (49) attempted to determine the effect of group competition, self-competition, competition with a rival of equal ability, competition with a rival of unequal ability, striving to set a class record and level of aspiration on the results of a fitness test by sixth grade boys. He concluded that all of the motivational conditions are significant in increasing performance on the test and that the validity of such tests are dependent on standardizing motivational techniques. He further concluded team competition and level of aspiration were the two most effective motivators. Hansen (19) compared the relative effectiveness of team competition, competition with a rival of equal ability, immediate knowledge of results, standardized tests and subsequent knowledge of results. Team competition and rivalry with someone of equal ability yielded significant increases in strength during the six week isometric training program at the .05 level of confidence. The other motivators were not found to be effective in this program.

Nelson (39) used a total of ten motivating conditions on 250 University of Oregon students who were tested on the Kelso-Hellebrandt elbow flexion ergograph. Individual competition, ego-involvement and telling subjects that they

were setting standards for the United States Air Force Space Program were the most potent motivators. Also found to be effective motivators were group competition, observers presence, obtainable goal and competition with the Russians.

Nelson and Johnson (40) also did a motivational study which studied the relationship between strength development and motivation. They found that increases in strength during a training program are dependent upon some form of motivation. They concluded that in the absence of any motivation, training produced negligible increases in strength.

Most studies in motivation, learning and performance report positive findings. There are a few, however, that report either neutral or negative findings.

Lazarus (31) and associates contend that, although strong motivation may produce better performances, it also is capable of producing impaired performances, inasmuch as the ego defensive aspects of the situation may become too important or threatening to the individual that he ceases or reduces his attack on the task.

One of the few studies which report no positive results was one in which McGeoch and Irion (38) studied the effects of electric shock, knowledge of results and constant exhortation on eighty University of California students in a test of grip strength. They found no significant positive effects from any of these motivators.

A final area of importance in this section on the scope of motivational studies is an examination of a concept called achievement motivation. French introduces this concept in her study when she writes,

> The typical level of achievement need, as well as the stimuli present designed to increase the need level, must be taken into account in predicting motivational level in a given situation. (13)

French used ninety male students at Lockland Air Force Base in her study. Using McClelland's motivation imagery scoring system she divided them into high and low motivation groups. She then tested the subjects on a coding test with the addition of various incentives. She found that what is described as a typical level of achievement motivation is a significant variable affecting the degree to which a desired level of motivation can be aroused by introducing different incentives. Her findings suggest that an independent measure of motivation and a knowledge of the characteristics of the stimulus situation are both essential for predicting performance.

Rosen (42) presents material relevant to this subject in his article which claims that achievement motivation is a function of family size, position or order of birth and social class. He contends that if parents set high standards of excellence for their children in all tasks they tend to develop high achievement motivation. First born children and children in small families receive more

attention and greater emphasis is placed on their achievement than in large families. He states that

> Large families create a greater degree of interdependence between members and an increased need for co-operative effort and consensus. The precarious equilibrium of the large family would be threatened by excessive emphasis on competition and achievement. (42, p. 577)

Concerning the effect of social class on achievement motivation Rosen states that "Boys from the upper and middle classes show consistently higher achievement motivation than do lower class boys." (42, p. 584)

I have purposely omitted studies on individual and group competition from this section on the scope of motivational studies since the entire following section is devoted to such studies.

Individual and Group Competition

The writer feels that it is highly interesting to note that when one compares group competition with individual competition he is really touching on a comparison of the underlying motivating forces of two different political ideologies, the democratic ideology represented by the Untied States and the Communist ideology represented by Russia.

Bowen, writing on Russian education, noted that "with the new emphasis, the collective discipline, competition and a concern on the part of each individual for the group's performance became increasingly important."

(3, p. 149) He also wrote that the underlying assumption of Russian education is "that the collective was the basic social unit and that the task of education was one of absorbing the individual into the group." (3, p. 157)

No studies appear in the related literature which compare individual and group competition in increasing production in Communist youth. It can be seriously doubted if such studies will ever appear since individual interests are simply not recognized in Russia and the idea of rewarding individuals on the basis of individual achievement is incompatible with Russian doctrines. As Bowen states, "Individual interest, when it is present, is subordinated by the overwhelming needs of collective life." (3, p. 193)

All Russian educational and social institutions direct their efforts toward increasing the strength of the collective whereas educational and social institutions in the United States direct their efforts toward producing, independent, free thinking, well rounded individuals. Considering these conflicting emphases in Russian and American cultures it appears to be a natural correlate that group competition would predominate in the former culture and individual competition in the latter.

Vaughn and Diserens (55) also make the interesting observation that competition was at first a mechanism to satisfy other general motives such as self-preservation

sex and mastery. However, by the end of the Paleolithic period it became practically independent of any particular objective and was often practiced as an end in itself.

Recent studies have indicated that competition is very effective in increasing work output. Missiuro (36) discovered that work with weights in the presence of others automatically induced competition and greatly increased work output. He also found that working in the presence of superior rivals caused reduced work output with the opposite effect resulting from working in the presence of inferior rivals. Triplett (52) found similar results in an experiment involving cyclers in a twenty-five mile race. He compared race against time, race against time with a pacemaker and race against competitors with a pacemaker and found the element of competition to yield superior performances.

Shaw (45), however, reported negative results from competition on a perceptual motor task. He offers the following explanation of his results: It is believed that competitive situations arouse stronger motivation to achieve than do co-operative situations; this stronger motivation, however, results in poorer performance as measured by accuracy scores which are particularly susceptible to disruptive responses introduced by the energizing component of motivation. (45, p. 167) He

admits, however, that "measures of a motor output, such as speed and strength scores, probably would indicate superior performances in a competitive situation." (45) Also, Shaw does not differentiate between the effects of competition on subjects who have mastered a particular perceptual motor skill and those who are beginners at the skill.

Vaughn (55) in studying competition found that the possibility of achieving success or attaining the desired goal was a factor in determining the extent to which persons respond to competition. He discovered this fact in an experiment on marksmanship in which he gave gold medal awards for the highest score in one situation and the same award for improvement in another situation. His highly skilled subjects did better in the former situation and did considerably worse when competing on the basis of improvement.

An appropriate end to this discussion on competition would be to note conclusions made by Vaughn and Diserens on the subject:

> (1) Competitive conditions of one sort or another generally increase the efficiency of work and facilitate learning.
> (2) A particular form or type of competitive situation, however, does not affect all individuals in the same way.
> (3) Individuals display the competitive spirit and intensify their efforts to excel under those conditions that promise success.
> (4) Some people are inhibited by competition.

> (5) Complex tasks seem to be less suitable than more simple tasks for competitive situations. (55, p. 92)

Having discussed the concept of competition, let us examine individual competition and group competition specifically. The literature often refers to these two concepts as competition and co-operation with the latter denoting group competition. Phillips and De Vault make a pertinent observation on these two concepts:

> Competition and co-operation pervade most aspects of our life. In the free enterprise system which dominates our economic life, business and industry operate on a competitive basis. Yet, individuals in even the most competitive businesses must work together if their companies are to survive. (41)

Deutsch (9) clarified the difference between competition and co-operation or individual and group competition when he wrote, in effect, that in a co-operative situation an individual obtains a goal only if all individuals obtain it. On the other hand, in a competitive situation, if one individual reaches a goal, the other individuals will be hampered in their efforts to attain it.

Turning to the actual studies done in the area of the relative effectiveness of individual and group competition as motivators one finds much controversy and confusion. There are not two studies which resemble each other closely. The tasks differ markedly, the subjects vary in age, sex and education, the size of groups are not constant and the rewards vary greatly. Confusion also

exists because many investigators called group competition, co-operation. Julian and Perry noted this when they wrote that:

> Particular effects attributed to co-operation may well have been due to the competitive inter-group relations rather than the co-operative relations which existed among the members of the group. (27, p. 80)

In 1963 Miller and Hamblin (35) reviewed the literature to determine the relative effect of co-operation and competition on group productivity. They found that in fourteen studies competition resulted in greater productivity while in ten others co-operation resulted in greater productivity. The same authors partially resolved this conflict when they reassessed the findings, classifying the tasks used by the investigators in the studies examined into those high in inter-dependence and those low in inter-dependence. They then found that co-operation increased productivity in tasks high in inter-dependence and differential rewarding or individually striving for awards increased productivity in tasks low in inter-dependence. (35)

Classic studies finding individual competition superior to group competition were done by the following investigators: Sims (46) using one hundred college sophomores as subjects, found individual competition superior to group competition on a mental substitution task. Maller (32) and Forlono (12) found similar results testing young

school children on mental tasks. Whittemore (58) found that individual competition tended to increase the quantity of production but tended to decrease the quality of performance.

Miller and Hamblin (35) as well as Jones (26) divided the tasks used in their experiments into high and low interdependence tasks. They made identical conclusions that individual competition increased production on tasks of low interdependence while group competition was superior in increasing performance in tasks of high interdependence.

Classic studies which find group competition to be superior to individual competition were reported by the following investigators. Deutsch (10) used two tasks, a human relations problem and a puzzle and found that group competition increased production more than individual competition on both problems. To quote Deutsch:

> Working as a co-operative group in comparison to working in a competitive group showed more co-ordination of effort, achievement pressure, productivity per unit time, and better quality of product and discussions. (10, p. 200)

Allport (1) reported Moede's findings that both individual and group competition are superior to no competition in a strength test but the latter superior to the former.

Hurloch (23) found similar results using a mental task (addition) on school children. Whittemore (58) and Hammand and Goldman (18) did experiments which

concluded that co-operation or group competition increased the quality but not the quantity of production.

Using seventy-six graduate and under-graduate students from the Unviersity of Connecticutt, Wegner and Zeaman (57) found group competition to be superior to individual competition using a perceptual motor task (pursuit rotor).

Shaw (45), as reported earlier, reported different findings using the same task. He found that both individual and group competition produced inferior results to pure co-operation with no competition on a complex perceptual motor task. Julian and Perry (27) using mental tasks, on University of New York students at Buffalo found that both individual and group competition resulted in more superior quality and quantity of performance than did a pure co-operation situation. These findings are obviously different from Shaw's, however, the tasks used by the investigators differed markedly.

There have been a few studies reported by physical educators on individual and group competition as motivators. The results, however, are just as confusing as those previously reported. Hesse (20) is the only investigator who isolated individual and group competition and attempted to discover which is the superior motivator. She tested female junior high school subjects on the standing broad jump and the sixty-yard dash. Her findings are not

consistent with the literature in that she found neither individual or group competition significantly superior to no motivation at all.

Clawson (6) and Gerdes (17) found team competition to be superior to other motivators including level of aspiration. They did not use individual competition in their studies. Clawson tested college girls on archery skills and Gerdes tested college men on seven physical test items which included items of strength, skill and endurance.

Nelson (40) and Strong (49) report conflicting results. Nelson, testing college males on arm strength found individual competition superior to team competition although both are superior to other motivators including verbal encouragement and instructor interest. Strong, testing secondary school boys and girls on selected physical tests found team competition to be superior to individual competition. He also found that strength and endurance were more affected by motivating conditions than was raw skill.

Hansen (19) testing college males on a strength training program found individual and group competition to be superior to three other motivators in increasing strength performances.

It seems clear that attempts to discover whether individual or group competition is superior in increasing

learning performances whether intellectual or motor have failed to produce conclusive results.

However, the literature reveals that group competition has a number of advantages over individual competition in such areas as personal, social and psychological development. The power of peer motivation to not only increase performance and learning but to teach values and attitudes has been relatively untapped by modern educators. There is much evidence in support of this point of view. Johnson, Steffler and Edelfelt state that

> All too frequently the tremendous impact of group pressures and social dictums are overlooked by teachers, counselors and parents. The influence of the peer group is particularly great among the adolescents. Educators and parents must understand and accept the fact that the adolescent typically seeks approval of his peer group first, and only then does he look for the approbation of his elders. (25, p. 219)

Warters states that:

> The inter-communication of ideas, the co-ordination of efforts, the friendliness and pride in one's group which are basic to group harmony and effectiveness appear to be disruptive when members see themselves to be competing for mutually exclusive goals. (56, p. 20)

Deutsch (10) cites an additional goal inherent in group competition in his observation that in the co-operative situations the individual may have two goals: (a) receiving a reward for himself and (b) seeing a group with which he identifies also receive a reward. Finally, Steinhaus (48) points up the importance of realizing that

adolescents change from beings motivated by individuals (mother, father, teacher) to beings who are essentially motivated or rewarded and punished by their peers. He further contends that many teachers have yet to realize this fact and many that do have not made full use of it.

In light of the support for group work in the writings of psychologists and educators it is the writer's contention that if team competition can be proved to be as effective or more effective a motivation than individual competition its inherent concomitant benefits warrant more extensive use by educators in our school system and a reduced emphasis on individual competition for grades as the prime motivator.

Summary of Related Literature

Although an all-inclusive, comprehensive theory of motivation has not yet been formulated to explain man's behavior there are a number of theories available to enlighten those seeking to understand the why of man's behavior. Psychologists, educators and physical educators have presented conclusive evidence that motivation is of tremendous importance in increasing learning and performance in their respective fields.

A number of investigators have concluded on the basis of careful experiments that such motivators as individual and team competition, level of aspiration, verbal encouragement and verbal disparagement, audience incentives, ego

involvement and competition against standards are, in fact, effective in increasing performance and learning in a variety of tasks. Difficulty in drawing conclusions is encountered on the relative merits of each of these motivators becasue different types of tasks were used on different types of subjects by the various investigators.

Studies done in the area of individual and team competition in the areas of psychology, education and physical education are confusing and contradictory. The majority of studies find both individual and team competition effective but neither superior to the other. However, some studies find one or the other or both ineffective in motivating human performance. There is some evidence that individual competition is superior when tasks of low inter-dependence are being performed and that team competition is superior when tasks of high inter-dependence are being performed. The evidence in this area, again, however, is not conclusive.

Since but one study has been done in the field of physical education which attempts to discover the relative effectiveness of team and individual competition as motivators, the writer feels taht further investigation into this area would be significant and important to anyone interested in improving human motor learning and performance.

CHAPTER III

RESEARCH PROCEDURE

Description of the Sample

A total of eighty-nine boys (with an average age of thirteen years, eleven months), were used from Pattengill Junior High School, Lansing, Michigan. These boys constituted two eighth grade classes and one ninth grade class. One of the eighth grade classes contained thirty-one boys, the other contained thirty, and the ninth grade class had twenty-eight boys in it. The sample used was therefore an available one. There did not appear to be any inherent bias in the sample. The students had originally been randomly assigned to the respective classes by the school administration. There were three negro students in each of the three classes.

The district from which the subjects were drawn is a predominantly white urban middle class community with a minority of lower and lower-middle class families.

Description of the Test

The Y.M.C.A. Athletic Achievement Test was the test used in this study. This particular test was developed out of work done by Dr. N. P. Neilson and Dr. F. W. Cozens

(8). These men tested more than 100,000 secondary school children in the 1930's on a series of athletic tests including push-ups, pull-ups, shuttlerun, basketball throw and rope climb. They recorded the age, height and weight of each contestant and developed a set of standard scores for each of the five test items. They set up six classifications (A, B, C, D, E, F) on the basis of age, height and weight to allow the smaller, younger boys to compete on an equal basis with the larger, older boys. The standard scores ranged from 1 to 100 for each event on the basis of his classification and his raw score on the event. It was therefore possible to score 500 points on the total test. For example, a boy in classification A receiving raw scores of 47 (push-ups), 3.3 (rope climb), 22 (basketball throw), 21.6 shuttle run) and 17 (chin-ups) would receive standard scores of 95, 90, 80, 80 and 75 respectively and a total score of 420 out of a possible 500.

A complete and clear explanation of the classification system and the standard scores for each event can be found in the Y.M.C.A. Athletic Achievement Program Manual (14). The coefficient of reliability for the test was found to be .96. This was a Pearson-Product coefficient of correlation of the results on a test and retest of the control group.

A description of the individual test items comprising the athletic achievement test is as follows:

(1) Push-ups.--The contestant lies on the floor, face down, body straight with the hands on the floor in front of the armpits. From this position he straightens his arms until he is in a front-leaning rest position. He then lowers his body and straightens his arms as many times as possible. Each raising of the body counts as one push-up. It is imperative that the body remain straight or rigid.

(2) Rope Climb (15 feet).--A suspended rope was used 1½ in. in diameter. The contestant stands grasping the rope reaching as high as possible. At the signal "GO" he starts to climb, using hands and feet if he wishes, or hands only if he so desires, the object being to reach the 15 foot mark on the rope as quickly as possible. The contestant's performance is recorded as the elapsed time from the signal of "GO" to the instant the hand touches or passes the marked distance.

(3) Basketball Throw for Goal (one minute).--The contestant starts in back of the free throw line 15 feet from the back board. On the signal "GO" he shoots for the basket and each of the remaining throws is taken from the point at which the ball is recovered. The contestant's performance is recorded as the number of goals made in one minute. Shooting for the goal continues until the signal

"STOP" is given at the end of one minute. Contestants are permitted one step on each shot after the initial one. If the ball is in the air on the signal "STOP" the point is awarded if the ball goes into the basket.

(4) Shuttle Run.--Two small blocks of wood each measuring 3" x 2" x 1½", one painted white and one painted red are placed in one foot circles whose centers are located 34 feet and 42 feet respectively from a starting line.

At the starting signal "Take your mark, set, go" the contestant starts from behind the starting line, runs out and brings the blocks back, one at a time, places them in the circle behind the starting line then returns the blocks, one at a time to their original positions and finishes as he recrosses the starting line. The contestant's performance is recorded as the time elapsed from the signal "GO" to the instant he crosses the starting line at the end of the second round trip. (The overall distance traveled is 304 ft. or 101 1/3 yd.)

(5) Chin-ups.--The contestant hangs onto a horizontal bar with arms and legs fully extended using the forward grip (back of hands to the face). He raises his body by his arms until his chin can be placed over the bar and lowers his body to a fully extended arms hang. The contestant's performance is recorded as the number of pull-ups made after full extension of the arms.

The rope climb, shuttle run, and basketball throw were timed with a stop watch which measures in seconds and tenths of seconds.

Test Schedule

The testing was done during the months of April and May, 1968. On April 9 and April 10 the age, weight and height of each subject was tabulated. The investigator personally weighed and measured the students.

The athletic achievement tests were conducted during class periods. It took two class periods to test each class on the Y.M.C.A. Athletic Achievement Test. On April 16 and April 17 each of the three classes was tested initially with no motivating factors employed. One of the classes subsequently was randomly selected as a control group, one, a team competition group and the other, an individual competition group, and on April 23 and April 24 each class was re-tested with the above motivational variables injected. On April 25 awards, to the winners, were presented and the classes were informed that they would be re-tested in three weeks under the same competitive conditions.

The test schedule was arranged so that each class was tested and re-tested on the same day of the week and the same hour of the day on each of the three tests. The order in which the test items were administered was identical for each class on all three tests. Information

as to how the test was administered can be found in the following section.

Administration of the Test

As mentioned in the section Test Schedule it required two hours or two class periods to test one complete class (30 subjects) on the entire 5 items of the test.

On the first day of testing, each class was tested on the push-ups, the basketball throw and the rope-climb, in that order. On the second day, the shuttlerun and the chin-ups were run in that order. Each class began with a warm up involving light running and calisthenics. General information concerning the test, such as scoring and standards were given to the entire class by the investigator. Immediately following, instructions on the push-ups were given to the whole class by the investigator. A student demonstration was used to supplement instructions. Instructions were identical to the test description given in a previous section.

Following instructions the class was divided into two equal sections. One section went to one end of the gymnasium with the investigator and the other half to the opposite end with the regular physical education instructor. Subjects were tested individually by the two testers. When all subjects had been tested the two sections were reunited for instructions on the basketball throw. The same procedure was used for all five items.

The procedure used in the two re-tests of each class was identical to the procedure used on the original test. The same procedure was followed on all tests in all classes except the team competition class. This class was tested in teams on the two re-tests. However, the same order of testing was followed in this class as in the other classes. For each test item three teams were tested by the investigator and two by the regular physical education instructor. Details on the team construction for team competition are found in the next section.

The standard scores for the test items were posted on the wall for all classes on all tests so that contestants could construct their own scores and compare them to the standard scores. Each subject's score on each individual test item and on the total achievement test was posted the day after the test was completed. Since subjects were aware of their scores and the standard scores were posted, the two motivational factors of knowledge of results and competition against standards were operative in all tests of all classes.

Motivational Variables

Individual Competition

After the initial test one of the classes was randomly selected as the individual competition class. This class shall be referred to as Group A. On the first re-test

Group A was given the same general instructions as in the initial test. In addition, however, this group was told that the six students who increased their scores the most over their previous score would receive a trophy. The trophy given was an inexpensive, four inch, silver trophy with a black plastic base. The winner's name, school, date and nature of award (Athletic Achievement) were put on the base with a dyna-label-marker machine. It is important to note that the subjects were not informed beforehand that they would be retested so that they had no opportunity to practice. Results of the retest were posted the day following the test and the awards presented.

Before the awards were presented Group A was informed that they would be retested in three weeks time on the same basis as the previous retest. Group A was shown the new award at that time (an athletic achievement crest with school name on it in school colors) and informed that the six students who increased their score the most over the previous retest would receive the awards. The class was further informed that the first twenty minutes of each class for the next three weeks was available for practicing the events. They were also told that the investigator would be available to test those who wished to be tested on any particular event.

Group Competition

Succeeding the initial test one of the classes was randomly designated to be the team competition class. This class shall be referred to as Group B. Group B is a ninth grade class and Group A an eighth grade class. On the basis of the initial scores, Group B was divided into five teams of six boys per team. The investigator picked the teams so that the average score of each team would be as equal as possible. On the day of the first retest, following the warm up and general instructions, students were placed in their respective teams. They were given their team average from the first test and a chance to become familiar with their team mates. They were then instructed that the retest would be on the basis of teams and that the members of the team that increased its average score the most over the initial test would receive trophies. The trophies were the same as those given to Group A. Group B had not been informed earlier that they would be retested so thay had no opportunity to practice.

Awards were presented to the winning team the day following the test. The team results were posted on the gymnasium bulletin board. Prior to handing out the awards Group B was also shown the Athletic Achievement Crests and informed that they would be retested in three weeks time. They were informed that they would be competing in the same teams and that awards would be won by members of the team

that improved the most over test two and they were given the same information as Group A regarding the twenty minute practice period.

Control Group

The class which was randomly selected to be the control group was an eighth grade class. This class was called Group C. Group C was retested on the same basis as the initial test except they were told that the object of the test was to determine how much they would improve and that their scores would be improvement rather than absolute scores. The day after the retest their scores were posted and Group C was informed that in three weeks they would be retested again and that the object of this retest was to determine how much they could improve with practice. They were given the same information as Groups A and B regarding the twenty minute practice period.

Method of Analyzing Data

The method of analyzing data is relatively straightforward. For each Group (A, B, C) a mean score was determined for the original test and the retest with experimental conditions added.

Analysis of co-variance was applied to the test and retest scores to arrive at means adjusted for initial differences, both within and among groups. If a significant F resulted from this analysis, indicating that

differences among the three groups are present, then the Scheffé method of comparing adjusted means was run to determine exactly where the significance lies. A t-test of significance was applied to determine whether the adjusted mean scores are significantly different from each other in the following situations:

(1) A t-test of significance to determine if the adjusted mean score of Group A is significantly greater than that of Group C.

(2) A t-test of significance to determine if the adjusted mean score of Group B is significantly greater than that of Group C.

(3) A t-test of significance to determine if the adjusted mean score of Group B is significantly greater than that of Group A.

The above procedure was used to analyze both Phase I and Phase II. To analyze Phase II the mean scores for each group on the final test were compared to the mean scores on test 2 to determine if differences between group means on the final test were significant.

The investigator will accept significance at the .95 level of confidence. In situations where significance is achieved at the .05 level the test will be extended to determine if the difference found is also significant at the .01 level. Also, setting alpha at .05, beta at .10 and delta at one standard deviation and calculating n (number

of subjects) it was found that an n of 30 is a necessary and sufficient sample size. Therefore, in cases where the null-hypothesis is accepted and the difference between means is not significant, conclusions to this effect can be made at the 1-beta (90%) level of confidence.

CHAPTER IV

RESULTS

The statistical technique used to analyze the data in both Phase I and Phase II was analysis of co-variance and the Scheffé method of analyzing means adjusted by co-variance. Co-variance was used to account for initial differences in the groups studied. Alpha was set at .05, beta at .01 and delta at 1 standard deviation and an n of 30 was found to be a necessary and sufficient sample size. One of the assumptions of analysis of co-variance was broken in this study. The test assumes a random sample and the sample used was an available one and subjects were not randomly assigned to treatment groups. However, the investigator could find no reason to believe that the groups used would bias the study in any way. Subjects were originally assigned to the three classes randomly and all classes contained the same ratio of negroes to whites.

Analysis of Co-Variance of Phase I

Phase I involved testing all three groups on the athletic achievement test with no motivational factors present and retesting them one week later with the motivational factors injected. Since the subjects did not know that they would be retested it was felt that differences

occurring should be due to the motivational factors of individual and team competition. A control group was used to account for possible training effects as a result of repeating the same test in the short span of one week.

An analysis of co-variance of individual competition, team competition and control groups produced an F value of 16.5 (see Table 1). This value was significant at the .001 level and showed that significant differences among the three groups were present somewhere. The Scheffé method of comparing the differences between test 1 and test 2 means adjusted was used to determine which of the three groups showed significant improvement between test 1 and test 2. It was hypothesized that both individual and team competition would produce significantly greater improvement in test scores than no competition. A t-test of the difference between test 2 score means adjusted revealed this hypothesis to be true at the .01 level of significance. The t values were 13.9 when comparing the individual competition group and the control group and 12.32 when comparing the team competition group and the control group (see Table 2). A t value of 2.64 was necessary to obtain significance at the .01 level.

A comparison of individual competition and team competition groups produced a t value of 1.66 which was not significant. Since a t value of 1.99 was necessary for significance at the .05 level the hypothesis that team

competition would produce greater improvement than individual competition was rejected at the 1-beta or the 90 per cent level of confidence.

TABLE 1.--Analysis of covariance of Test 1 and Test 2 means of Phase I. Two experimental and one control group are inter-compared with Test 2 means adjusted for differences in Test 1.

Means	Indiv. Compet.	Group Compet.	Control	F	Signif. of Diff.
Test 1	237.4	263.1	281.46	2.46	N.S.
Test 2 (adjusted)	300.6	295.3	256.0	16.5	>.001

TABLE 2.--Scheffe analysis to locate significant differences found in Test 2 of Table 1.

Variable	N	$\bar{X}$ Test 2 adjusted	Diff.	S.E. Diff.	t-value
Individual competition	31	300.6	44.6	3.19	13.9**
Control	30	256.0			
Team competition	28	295.3	39.3	3.19	12.32**
Control	30	256.0			
Individual competition	31	300.6	5.3	3.19	1.66
Team competition	28	295.3			

**Significant at .01 level (t = 2.64)

Discussion of Phase I

Individual competition and team competition proved to be highly effective motivators in increasing scores on the Athletic Achievement test. These increases are especially significant since interest was extremely high on the original test. The fact that the investigator was new to the students seemed to stimulate them to try and make a favorable impression. Also, tests of physical ability have been hypothesized to stimulate boys of junior high school age to excel since success in athletic and physical activities is more influential in determining popularity than other abilities among boys in their early teens. Wilkinson (59, p. 96) cites observations by Jesse, Williams and F. L. Goodenough in his study which present evidence to this effect. Furthermore, the fact that the first time the subjects were tested was the only time that the testing situation was a novel one also seemed to result in high interest.

The results of the study require that the second hypothesis be rejected since no significant difference was found between the individual and team competition groups. It was felt that the extra incentive produced by peer encouragement and a desire to win for one's team as well as for one's self inherent in team competition would result in a better performance than individual competition alone. However, because subjects were placed in their teams only

fifteen minutes before they were tested the second time they did not have time to develop a sense of identification with their teams. However, during the test individuals in the group situation were greatly encouraged by their team mates while being tested and this fact does not hold true in the individual competition class. Furthermore, the nature of the task requires little or no co-operation between team members and is therefore perhaps more favorable to an individual competition situation. Nevertheless, team competition proved to be as effective as individual competition in this particular phase of the experiment.

Analysis of Co-variance of Phase II

Phase II was conducted to determine whether individual competition for awards or team competition for awards would be more effective in improving scores in a situation where both groups knew that they would be retested and were given a three-week period to practice. The analysis procedure for Phase II was identical to that of Phase I except that the results of the third and final test were compared to the results of test 2.

Analysis of covariance of individual competition, team competition and control groups in Phase II produced an F value of 4.42. This value was significant at the .05 level and showed that significant differences among the

three groups were present somewhere (see Table 3). The Scheffé method of comparing the differences between test 2 and test 3 means adjusted was used to determine which of the three groups showed significant improvement between test 2 and test 3. When the individual competition group was compared with the control group the resulting t-value of 1.89 showed that the motivation of individual competition did not produce significantly greater improvement than no competition in the three weeks allowed for practice betweeen test two and test three. On the other hand, when the team competition group was similarly compared with the control group the resulting t value of 2.5 showed that the motivation of team competition did produce significantly greater improvement than no competition (.05 level) between test 2 and test 3 (see Table 4).

Although these findings show that team competition produced greater improvement than individual competition the difference between these two improvements did not reach significance at the .05 level (see Table 4).

TABLE 3.--Analysis of covariance of Test2 and Test 3 means of Phase II. Two experimental and one control group are inter-compared with Test 3 means adjusted for differences in Test 2.

Means	Indiv. Compet.	Group Compet.	Control	F	Signif. of Diff.
Test 2	273.1	298.1	280.46	.60	N.S.
Test 3 (adjusted)	298.3	299.8	293.6	4.42	>.05

TABLE 4.--Scheffé analysis to locate significant differences found in Test 3 of Table 3.

Variable	N	$\bar{X}$ Test 3 adjusted	Diff.	S.E. Diff.	t-value
Individual competition	31	298.3	4.7	2.48	1.89
Control	30	293.6			
Team competition	28	299.8	6.2	2.48	2.5*
Control	30	293.6			
Individual competition	31	298.3	1.5	2.48	.60
Team competition	28	299.8			

*Significant at .05 level (t = 1.99).

Discussion of Phase II

Findings in Phase II show that the motivation of individual competition produced no greater improvement in performance in the athletic achievement test than the absence of planned competition in the control group. The motivation of team competition, on the other hand, did show greater improvement than was found in the control group. This suggests the superiority of the team motivated competition over the individual motivated competition in improving performance when three weeks of practice are allowed. The fact that the difference between the adjusted test 3 scores of these two groups is not significant does not appear to invalidate this deduction. The further improvement between test 2 and test 3 in the team motivated group is even more significant in light of the fact that great gains were made between test 1 and test 2.

Empirical observation of Phase II indicates that both individual and team competition induced the groups to make use of their twenty-minute practice period each day for three weeks. There is no way of knowing which group practiced hardest, however, more subjects practiced in the group class than in the individual class. In the group class, approximately twenty-two boys consistently practiced daily while approximately fifteen practiced in the individual class. Team leaders tended to appear in

the group class who encouraged and organized their team mates into group practice sessions.

The group process really became apparent during test three. Team members worked out with each other possible ways of bettering their scores on each event and vigorously encouraged each other while being tested. Team members encouraged those who had not done well in the second test to try as hard as possible.

The students in the individual class did not encourage each other at all. Motivation was high on the part of individuals taking the test but the added factor of peer encouragement was not present.

A further difference between the individual and team competition groups was that in the former subjects who performed poorly on one of the first items in the test tended to "give up" since they felt that they had little opportunity to win an award. Subjects in the team situation who did not do well on the first items were pressured by their team mates to try their hardest on all subsequent test items. These results are evidenced by the fact that 9 out of 30 of the subjects in the individual competition group received lower scores on test 3 than on test 2 (average drop of 19.3 points) wile only 4 out of 30 subjects in the team competition group received lower scores on test 3 than on test 2 (average drop of 13 points).

General Discussion

The outcome of both Phase I and Phase II of this experiment would perhaps have been greatly affected if the teams in the team competition group had not been arbitrarily selected but formed on the basis of student choice. The teams were absolutely arbitrary and were in this sense, socially "artificial" and therefore did not possess the social nearness or friendliness that more natural less "artificial" groups would possess. The writer feels that the social nearness or friendliness inherent in natural groups would likely result in greater team cohesiveness and team spirit which would affect results in favor of a team competition situation. In light of these facts perhaps it would have been more desirable to use a sociogram technique to construct teams rather than a purely arbitrary selection of teams.

The results of this study would appear to have implications for teachers of physical education and coaches of athletics, since both groups readily agree that in many situations it is necessary to rely on extrinsic motivation to increase interest and improve performance on certain physical activities.

The findings of this study suggest that introducing competitive situations (individual or group) in physical education classes of junior high school boys will increase interest and performance in physical activity. Empirical

observation of boys in both situations reveals that team competition contains certain inherent educationally favorable elements other than motivational elements. The power of peers rewarding and punishing each other is brought to bear on team members in the team situation and pressure is great to try hard for the benefit of the team. Individual competition, on the other hand, lacked this powerful factor of peer pressure.

Psychologists have long heralded the value of group dynamics or group interaction in aiding social-psychological development of individuals. If one accepts this statement as true it would appear advantageous to employ team competition in situations where its motivational values are equal to or better than those of individual competition.

CHAPTER V

SUMMARY

The purpose of this study was to compare the effects of team competition and individual competition for awards on the outcome in a Y.M.C.A. Athletic Achievement Test for junior high school boys.

Eighty-nine male subjects in three physical education classes were used as subjects. There were two eighth grade classes and one ninth grade class. The classes were randomly assigned to treatment groups.

Each of the three classes was tested with no motivational factors. Each subject's score was converted to a standard score using Neilson's and Cozen's classification system and standard scores. The classification system and the standard scores for each test item developed by Neilson and Cozens is carefully outlined in the Y.M.C.A. Athletic Achievement Program Manual (14). One week later, the three classes were tested again. One class, Group A, competed individually for trophies; a second class, Group B, was divided into teams and the winning team received trophies and the third class, Group C, repeated the test under the same conditions as the original test. Each subject's score was converted to a standard score so that each

score represented a value out of a possible 500 or a possible 100 on each of the 5 test items.

This part of the experiment was referred to as Phase I. The statistical technique used to analyze the scores of Phase I was analysis of co-variance of individual competition, team competition and control groups scores on tests 1 and 2 and a Scheffé analysis of adjusted test 2 means. The results of this analysis revealed the following findings: (1) the individual competition group and the team competition group improved their scores significantly more than the control group at the .01 level of significance; (2) no significant difference was found between the two motivational variables of individual and team competition. This result was accepted at the 90% level of confidence.

These results strongly indicate that both individual and team competition are significantly more effective than no competition in motivating junior high school boys to improve their performance on an atheltic achievement test. The results also indicate that the motivation of team competition is not superior to the movitation of individual competition in a similar situation.

Following test two which completed Phase I, all three groups were informed that they would be retested in three weeks and were encouraged to practice. The same experimental treatments were used on the same classes as were used in

Phase I. The new reward for which the experimental classes were competing was an athletic achievement crest in school colors with the name of the school included on it.

After the three week practice period all classes were tested exactly as was done in test two. Analysis of co-variance of individual competition, team competition and control groups on tests 2 and 3 and a Scheffé analysis of adjusted test 3 means were used to analyze Phase II. The following results were discovered:

1. Individual competition did not show significantly greater improvement than the control group. This result was accepted at the 90% level of confidence.

2. Team competition showed significantly greater improvement than the control group at the .05 level of significance.

3. As in Phase II, no significant difference was discovered between the motivational variables, individual and team competition. This result was accepted at the 90% level of significance.

These results indicate that in a situation where junior high school boys are tested on an athletic achievement test after three weeks of practice, team competition for awards is a significantly greater motivator than no planned competition (.05 level). No such improvement was found when motivation was purely by individual competition.

This leads the writer to believe that team motivated competition was superior to individual motivated competition in the junior high school boys here observed.

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APPENDICES

APPENDIX A

Athletic Achievement Standard Scores for
Group A (Individual Competition)
Tests 1, 2, 3

Subject	Classification	Test 1	Test 2	Test 3
1	F	258	313	313
2	E	338	344	365
3	D	116	170	159
4	D	244	236	259
5	E	229	218	264
6	D	234	304	300
7	C	366	417	430
8	D	350	361	396
9	C	306	277	355
10	D	355	390	420
11	E	293	358	391
12	D	198	237	248
13	D	355	361	389
14	C	144	180	205
15	B	320	325	337
16	D	212	269	258
17	E	355	387	407
18	A	27	80	52
19	E	242	324	359
20	C	47	109	108
21	C	271	316	355
22	C	134	149	152
23	A	242	271	268
24	D	93	115	96
25	D	307	421	388
26	E	310	251	234
27	D	302	319	334
28	D	219	264	277
29	F	118	140	176
30	C	98	154	166
31	E	277	306	340
Mean		237.4	273.1	287.52

APPENDIX B

Athletic Achievement Standard Scores for
Group B (Individual Competition)
Tests 1, 2 and 3

Subject	Classification	Test 1	Test 2	Test 3
1	C	271	309	300
2	D	315	297	342
3	C	372	426	439
4	A	233	348	355
5	A	123	142	193
6	B	306	343	346
7	B	235	255	311
8	B	373	414	422
9	D	324	353	358
10	B	354	411	411
11	A	340	364	367
12	C	177	353	267
13	B	265	308	318
14	A	192	338	235
15	A	297	328	310
16	B	227	231	277
17	B	287	313	330
18	B	216	287	275
19	C	255	285	302
20	B	171	240	266
21	C	351	339	385
22	A	207	259	263
23	A	167	199	186
24	D	338	336	338
25	C	369	377	403
26	B	232	265	343
27	B	208	254	294
28	A	164	194	198
Mean		263.1	298.1	315.5

APPENDIX C

Athletic Achievement Standard Scores for Group C (Control Group) Tests 1, 2, and 3

Subject	Classification	Test 1	Test 2	Test 3
1	F	356	402	405
2	E	347	327	362
3	C	224	231	243
4	B	183	116	139
5	A	81	74	81
6	C	272	284	306
7	E	274	302	300
8	D	321	310	351
9	D	155	164	186
10	C	411	387	425
11	A	126	126	98
12	C	278	292	336
13	D	359	380	384
14	D	392	397	412
15	D	401	425	418
16	D	271	267	285
17	C	223	278	305
18	C	245	226	238
19	B	175	195	198
20	B	317	325	322
21	C	343	345	341
22	D	279	299	296
23	D	416	442	451
24	A	261	171	233
25	C	230	189	226
26	C	336	333	307
27	D	272	304	313
28	C	307	325	261
29	A	230	144	139
30	E	359	350	346
Mean		281.46	280.46	290.33

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1968