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Improving the Cardiovascular Fitness of Eighth Grade Girls With Aerobics

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Running head: CARDIOVASCULAR FITNESS WITH AEROBICS

Authorship Statement

I hereby testify that this paper and work it reports are entirely my own. Where it has been necessary to draw from the work of others, published or unpublished, I have acknowledged such work in accordance with accepted scholarly and editorial practice. I give this testimony freely, out of respect for the scholarship of other workers in the field and in the hope that my own work, presented here, will earn similar respect.

Abstract

Improving the Cardiovascular Fitness of Eighth Grade Girls with Aerobics.

Cooper, Harvey, 1985: Practicum Report, Nova University, Center for the Advancement of Education Descriptors: Physical Fitness / Cardiovascular System / Heart Rate / Blood Circulation / Exercise Physiology / Aerobics / Women Athletics / Physical Activities / Junior High School Sports / Cardiovascular Endurance / Rope Jumping / Female Conditioning.

The writer developed and implemented a program that would improve the eighth grade girls' cardiovascular scores with aerobics. The practicum setting was a junior high school located in a southern urban metropolitan area. The program's aims helped the eighth grade girls to improve their cardiovascular fitness, to adapt to stress, have a good self-image, and to improve their physical being. They were made aware of the fact that regular exercise had many mental benefits. The program began with the testing of the girls in the 12-minute run. After testing, the students received a point chart. The students had to obtain 30 points per week.

The program consisted of five tasks: Distance Running, Fartlex Running, Interval Running, Running for "A," Repetition Training, Rope Jumping. The results of the aerobic training showed that the eighth grade girls improved on their cardiovascular score by 24 percent or higher.

The program became a permanent part of the physical education curriculum for the school. Also, this program will be used in the school's Community School Conditioning class. (Appendices include Rope Jumping Program, Running Track, Heart Rate Chart, Jogging Chart, Aerobic Chart, and Point Chart.)

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Chapter I

Purpose

This practicum setting was a Junior High School that was located in a southern urban metropolitan area with a population of 145,254. The writer was a physical education instructor, who had taught physical education at the school for ten years. The school's population was 1,266. Fifty-six percent of the students were female. The physical education classes averaged 56 students per class. Fifty-eight percent of the students enrolled in the classes were females.

The school drew its students from two different communities. The black students, who made up 17% of the school's population, were bussed to the school out of their immediate neighborhoods to achieve racial balance. The neighborhood, which was located in the inner city, consisted of low-income apartments and a public housing project. Because of the crowded conditions, lack of recreational facilities, lack of leadership, and pride in their personal grooming, the students had very little opportunity or desire to engage in any kind of cardiovascular activity.

White students made up 10% of the student body. These students lived within walking distance of the school. Because of language and cultural differences, the white students had very little involvement in the team sports or social events that were provided by the school or the community.

The remaining, and majority, of the students were Hispanics. They were well groomed and they placed their emphasis on the grooming of their hair. The females were heavy users of facial cosmetics. The Hispanics were well nourished and typically overweight. The cultural diversification of the students had tremendous impact on one's fitness and athletic prowess. The Hispanic culture taught young ladies not to actively pursue athletics because it was seen as a masculine area.

The school was under a federal program that provided for the underprivileged. The students were from low-income families and received free or reduced-rate breakfast and lunch each school day. The meals were well balanced and may have been the only source of nourishment for the 824 students involved in this program. The program was composed of 80% Hispanic, 16% black and 4% white.

The problem this practicum was concerned with was that the eighth grade girls at this school had a low level of cardiovascular fitness. At the beginning of

the second grading period, 1984-1985 school year, the cardiovascular 12 minutes running test was administered to 123 eighth grade girls. Based on national norms, the students tried to achieve a score of 85% or better on the test. Only 6 of the 123 girls (5% tested) achieved this score.

These scores reflected the poor cardiovascular conditioning and motivation of the students tested. Also, the students did not achieve the 75% level of the national norm for their age level.

One study after another found that a majority of the young men were cardiovascular unfit, and the female fitness rating of young women was at a very low level. Much of this was a result of general ignorance and sociocultural bias. Both American and Hispanic homes did not encourage females to engage in any kind of physical fitness program. Worse, in subtle and not-so-subtle ways, the females were actually discouraged from using their bodies in a truly athletic way. Physical activity had often been associated with lack of sophistication of being "unladylike." Many individuals believed that sweating during physical activity was not 'ladylike." Among other factors that were known to be detrimental to young girls' cardiovascular fitness was poor nutrition. This factor was caused by low-family

income and lack of nutritional knowledge. Snacks often accounted for one-fourth of the girl's energy intake and furnished one-fourth of the day's nutrients. The girls had "finicky" appetites, preferring sweets and highly flavored foods.

Obesity was common in Hispanic teenagers because of the heavy family meals, in-between meal snacks, and the lack of physical activity.

Ninety percent of the girls traveled to and from school by private car, public bus, private bus or the public school bus system. Sixty percent of the girls lived one quarter of a mile to a mile from the school, yet would travel to school and from school by some form of mechanical machine rather than walk.

In the past, very little was done to improve the scores on the cardiovascular fitness test. Students and their parents had accepted the poor physical conditioning that had kept students from scoring higher on the cardiovascular fitness test.

The students had to be aware and convinced to commit themselves to obtaining better scores and to become better fit.

The local county's physical education department, as well as the school staff in physical education, had become involved with improving the test scores, the

testing program and the students' fitness. When administering the cardiovascular fitness test, the physical educator should be aware that the validity of the measures of the test items are dependent upon securing the all-out effort of the students involved.

The major outcome of this practicum was to increase the cardiovascular fitness of all the eighth grade girls. All of the 219 eighth grade students participated in the aerobics running for 12 weeks. All students improved their cardiovascular test scores after the aerobics program and at the same time became better fit.

The target group was 20 girls who were in the writer's third-hour class. The students who achieved a score of 50% or higher on the cardiovascular fitness test were referred to as the "super" group. These students improved their scores by 20% or higher. They earned the cardiovascular fitness award and this was an incentive for the remaining 14 girls who scored below the fortieth percentage on the test. These were referred to as the "basic" group and improved more on their lowest test score and obtained a better self-image. They learned the basics for good fitness and used this knowledge to become better fit.

The students, at the end of twelve weeks, were administered the cardiovascular youth fitness test.

Their scores were compared to their first test scores, to determine the improvement in their fitness. Their scores were also determined if they were in line with the practicum projected improvement: the "super" group to improve by 15%. In addition, this determined if the students were eligible for the cardiovascular fitness award.

Although not a measurable outcome, it was hoped that students will become interested in improving their fitness, not only for the cardiovascular fitness test, but to improve their physical being. The carry-over effort was to motivate those into working weekly on their fitness. They understood that people who exercised regularly were unlikely to be obese and were less likely to have health problems. In addition, they were aware of the fact that regular exercise had many benefits. People who are fit may be able to resist fatigue. They will be better able to adapt to stress and will have a good self-image. This will help them in their studies and in their normal daily living.

Chapter II

Research

A physical fitness program at the secondary school is of critical importance. Dr. Ernest Jokl, Director of the Exercise Research Laboratories of the University of Kentucky, tested 4,000 children 6 to 18, by checking their performance in the 600-yard run. He found that girls reach maximum fitness during puberty, but soon lose it again unless their fitness level is maintained by exercise.

To find a program that would be beneficial to the student at the school, the writer examined four successful cardiovascular fitness programs that had this similar problem. The programs were: Running for "A" Program; the Graduated Fitness Program; Aerobic Point Program; and the Circuit Training Program.

The Running for "A" Program was introduced by a physical educator from a mid-American junior high school. This program awarded grades based on the distance students can run in 12 minutes. The modus operandi was for the girls to run up to a mile or a mile and a half at the beginning of every physical education class and then go on to the usual sports and activities.

When the girls were first tested, only 4% made "A's" and 29% made "B's"; by June, the conditioning had worked so well that 37.7% earned "A's" and 52.2% earned "B's."

The second was the Graduated Fitness Program. This program was successful for an East Coast Junior High School. The physical education instructor tested 96 girls who were 14½ years old, whose average weight was 125 pounds, and average height about 5'5". At the beginning of the semester, only 26.1% could run farther than 1.15 miles in 12 mirutes. For the next 12 weeks, four times a week, the instructor used the Graduated Fitness Program. Steps were meant to be a series of tests and although they are arranged in sequence some were more easily achieved than others. In the earlier stages, some steps tested speed and some tested stamina. For example, it may be easy for a student to walk four miles in an hour, but quite hard for them to cover one and a half miles in 16 minutes. After 12 weeks of training, the girls were tested again. The percentage of those who could not do more than 1.15 miles in 12 minutes elevated their scores from 26.1% to 74.8%.

The third program was Dr. Cooper's Aerobic Program. This program's strong point was its point chart. Here was the unique merit of the aerobic system. The students measured their own progress with the point chart. Each

girl had to maintain 24 points per week. The point chart allowed students to measure the amount of effort expended.

The fourth program was Circuit Training Program. The solution to low scores on the youth physical fitness can be achieved through a progressive circuit training program.

This kind of exercise program had been used for many years both in the United States and Europe. A Junior High School from the West Coast used this program with a great deal of success. Circuit training was similar to an obstacle course. The circuits included aerobic exercise, aerobic jump rope, an obstacle course, and a station for training the students on how to test properly. This program increased the school physical fitness test scores by 10% the first year.

The solution to low scores on the Cardiovascular Fitness Test can be achieved through the Aerobic Program. The writer selected this program because it was based on a point system. The students measured their own progress as if they were being monitored in a medical research laboratory.

The aerobic point system was derived from laboratory measurements of the oxygen in field tests. The point value assigned each exercise indicates that particular activity. More points meant more effort expended, that

is, more oxygen burned in the body at a faster rate. In short, the point system measured the energy cost of the exercise. For example, if a student runs a mile in 11½ minutes, she could earn 3 points. If she runs the mile in 8½ minutes, she could earn 4 points.

The cardinal rule of the aerobic point system was: safety, slowly and progressively. The point chart must be followed.

This solution was chosen because it met many of the basic needs of the students. Psychologically, aerobic exercise provided motivation for the students because of its current popularity on television and in the health spas. This created a desire, as well as enabled them to teach their parents, thus providing even more incentive and a sense of pride in their accomplishments.

This strategy was also chosen because, from a social standpoint, students were not being called upon to compete against each other in a class situation. Because the point charts let students measure the effort expended, one can exercise progressively. This item was vitally important; in fact, it was the key to the aerobic condition program. The body must gradually adjust itself to increasing amounts of exercise. Too much too fast can be as damaging as too little too late.

Financially, the students were able to practice all of the activities because it cost little, if anything at all. The only equipment that was needed was a stopwatch and a point chart. The relatively inexpensive items allowed the highly motivated students to earn the weekly required points.

Politically, these students had an opportunity to win attention from the President of the United States, other members of the school and the community. The aerobic program allowed students to become physically able to score on the same level with other students throughout the United States.

This strategy also worked from a social psychological view, because it allowed students to interact in groups or on an individual basis.

In essence, students were motivated to continue aerobic training by socially acceptable means, while strengthening the heart and other muscles, and improving cardiovascular scores.

Therefore, a basically mechanical approach, along with the psychological and social approach, made this aerobic program successful.

Chapter III

Method

Cardiovascular fitness is the fitness of the heart, lungs, blood, and blood vessels. "Cardio" is another word for heart, and "vascular" refers to blood vessels. Of all the parts of fitness, this is one of the best for helping one feel good and enjoy life more. In order to develop and maintain good health, a person needs to strengthen the heart muscle and also improve the other parts of the cardiovascular system. The person who exercises will have a stronger heart muscle than a person who does very little. Also, as people exercise, they increase the fitness of other parts of the cardiovascular system, such as the blood vessels and the blood. Scientific studies have shown that active people have less heart disease and are less likely to die from heart attacks than inactive people. Some symptoms of heart disease start to develop when people are in their teens. For this reason, it is important to develop and maintain cardiovascular fitness early in life.

The program this writer used to improve the students' cardiovascular fitness is the Aerobic Point Program. Aetobics means "with oxygen." If exercise is not too

fast and if it is steady, the heart can supply all the oxygen the muscles need. This kind of exercise is aerobic exercise and includes activities such as running, walking, swimming, rope skipping, and cycling. For the writer's program, only running, walking, and rope skipping will be used to increase the students' cardiovascular fitness scores.

The first week the students were issued a point chart and they were instructed on how to calculate their daily and weekly points. All eighth grade girls had to earn 30 points per week. The aerobic points system was derived from laboratory measurements of oxygen cost of the exercise, as well as data obtained in field tests. For the users of this program all that is necessary is to understand that aerobic points refer to the energy expended. The point value assigned to each exercise indicates that amount of oxygen consumed by the body during a particular activity. More points meant more effort expended, that is, more oxygen burned in the body at a faster rate.

This aerobic program consisted of the following tasks: Twelve-Minute Run; The Harvard Step Test; Pulse Rate Counting; Fartlex Running; Distance Training; Imaginative Running; Repetition Running; and Rope Jumping.

Twelve-Minute Run

Of the many different cardiovascular fitness tests, the best tests are lab tests. They involve use of much equipment and must be done in a physical fitness laboratory. Lab tests are often done on a stationary bicycle or on a treadmill. These tests are sometimes called stress tests because they are done to see how the heart responds to the stress of hard exercise.

Most students did not live near a lab with the equipment necessary to take an exercise stress test. The Twelve-Minute Run is a test that was developed to test the cardiovascular fitness without the need for a lab and much equipment.

The students were asked to run or walk as far as they comfortably can in twelve minutes. Students who became overly fatigued were instructed to slow down for a while until they could comfortably run without straining. After regaining their stamina, they continued to run or walk until the twelve minutes elapsed.

The farther the girls ran the better their scores. This test was not a race. It is true that the girls should do their best to let the instructor know their level of cardiovascular fitness. But it was no disgrace that a student could not run as fast as someone else. However, students were encouraged to work to improve on

their fitness so that they can do better the next time the test is given.

The Harvard Step Test

The Harvard Step Test was the second test that the writer used to evaluate the girls' cardiovascular fitness. To do this test, the students had to step up and down on an 18-inch high bench for three minutes. Immediately after stepping for three minutes, the girls sat down and recorded their pulse rate.

Counting Pulse Rate

The pulse is a wave initiated by the heart. It travels throughout the arterial system each time the heart beats. It is the change in the condition of the artery at the end of each heartbeat, at the point at which the change is felt. The pulse can be felt where a large artery lies near the surface at the temple, in the throat, at the wrist, inside the thigh, on top of the foot.

The resting pulse rate while seated gives important information about one's health and fitness. The average junior high school girl's pulse rate averages 82 to 89 beats a minute. The junior high school boy averages 80 to 84 beats a minute. The reason why girls have slightly higher pulse rate than boys is not understood. Rates as

low as 50 and high as 100 can still be within the normal range, according to the American Heart Association.

To count the pulse rate, the students were instructed to place the right index and middle fingers on the side of the throat near the Adam's Apple. Press lightly and hold until a pulse can be felt with the fingertips.

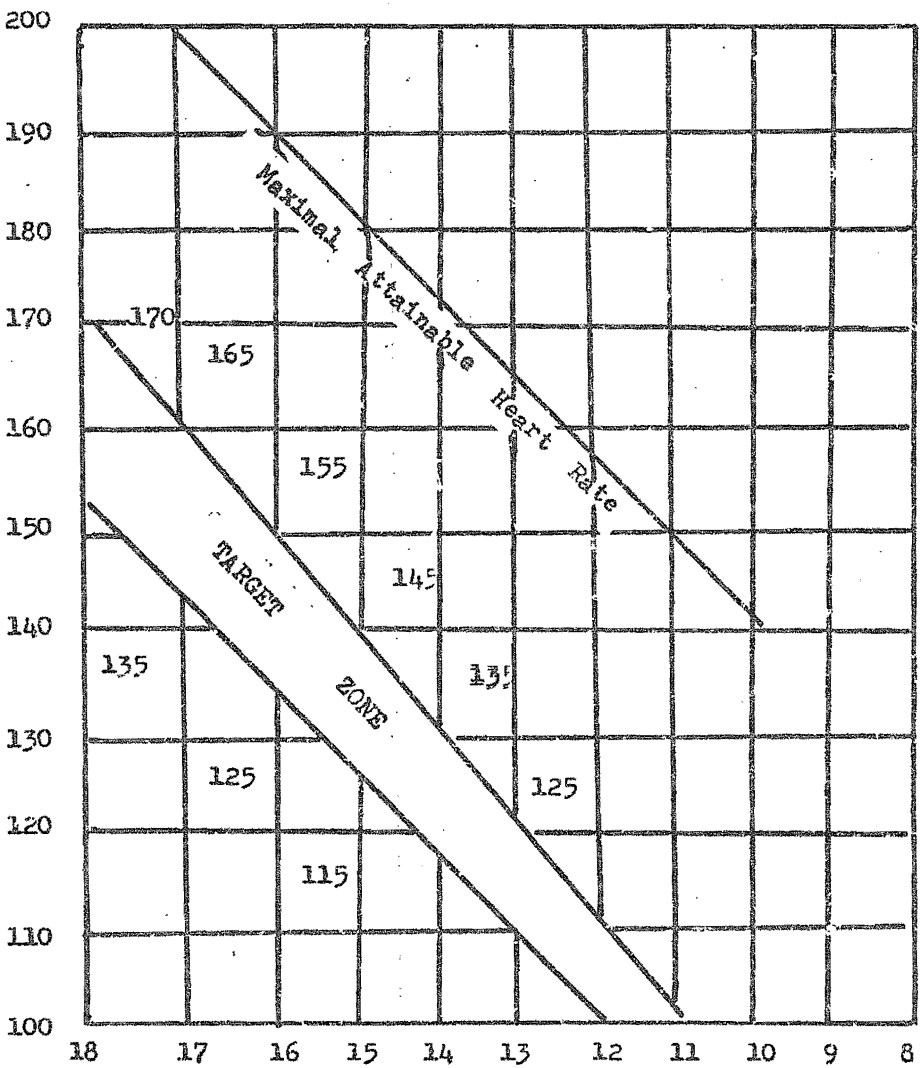
While running, it was recommended that the students maintain their heart rate within a target training zone to help improve their cardiovascular condition. The students had to stay within safe limits and not to extend themselves over the average maximum heart rate as shown in Table 1, the Target Zone. (See Table 1 for Target Zone.)

Warm-up and Cool Down

Before and after exercise, the students helped their cardiovascular system work more efficiently by warming up and cooling down. Research studies show that it is important for people to warm up before beginning long, hard exercise. Warm-up is a brief amount of mild exercise to prepare the students for more vigorous exercise. Before doing cardiovascular fitness exercise, it is important to warm up first. The warm-up would last at least two minutes and would consist of walking and slow jogging. The warm-up gets the blood flowing

Table 1

The Target Zone



so that vigorous exercise does not come as such a shock to the cardiovascular system.

After exercise, it is important to cool down by exercising slower. Cool down means to continue moving around for a few minutes after activity. If the exercise or run ends suddenly, the heart still pumps extra blood to the muscles, but the muscles do not squeeze the veins and return the blood. Thus, extra blood collects in limbs. The flow of the blood may be reduced to other parts of the body. This condition can cause a temporary reduction of blood to the brain that may cause dizziness. Students could even faint. The writer's cooling down period lasted for five minutes.

Distance Running

Jogging and distance running have enjoyed an astounding boom in the United States during the last few years. More than six million people in this country jog for exercise. Many more people could learn to enjoy this excellent cardiovascular exercise if they would learn how to jog properly.

The Distance Program began with techniques of jogging. The students were instructed on the proper techniques used in jogging. The student began by jogging a 100 yards practice jog. During the jogging practice,

each student worked with a partner to practice the techniques of jogging. The students evaluated each other by using the jogging form. (See the Jogging Practice form in Appendix G.)

The first five days the students jogged for a distance of one mile. The seventh and eighth day the students jogged one and one-half mile. The ninth and tenth day the students jogged two miles.

Because of the lack of students' interest in the distance running, changes were made in this activity. Grades were used as motivators. The grades were awarded to the girls based on their performances in the one-mile run. The girls did not earn an "A" unless they could run a mile faster than seven and one-half minutes. Eight minutes are required for the students to earn a "B" and nine minutes for a "C." A "D" is rewarded for any time longer than ten minutes.

Interval Training

There is no big secret about interval training. It is simply a matter of exercise and rest. But here is the big surprise. Interval Running means less running and more rest than other fitness programs. In a typical interval running workout, the students will spend perhaps as much as two-thirds of the time resting between quite

short bursts of runs. The students worked hard while they ran, of course, but at the end of the hour of training workout the students felt less tired than if they were running continuously.

The interval Running Program consisted of sets of work and relief intervals. The sets involved 400-yard runs. These sets of four intervals were the work of a 400-yard run completed in 100 seconds followed by a relief period of four minutes.

Fartlex Running

Cardiovascular endurance was developed through Fartlex Training by progressively increasing the intensity and duration of a workout. The following is the program showing progression that was used for the development of the eighth grade girls' cardiovascular endurance.

1. First Week: Beginning program. Following three-minute warm-ups, the girls ran 100 yards as fast as possible, then they walked for two minutes; performed three minutes of calisthenics; sprinted for 50 yards; walked one minute; jogged one minute; sprinted 50 yards; jogged to assembly area.

2. Second Week: Progressive program. Following the warm-ups, the girls ran 125 yards as fast as possible; they walked for two minutes; performed three minutes of

calisthenics, sprinted 75 yards; jogged 100 yards; walked 50 yards; sprinted 75 yards; jogged two minutes; sprinted 50 yards; jogged to assembly area. The Fartlex Running lasted for two weeks.

Repetition Training

This method of training requires that the girls cover a given distance, at a particular speed, a specified number of times. They were given a complete rest between each effort as well as the length of rest period. The writer's program consisted of the girls running for separate one-half mile distance at a speed of four minutes for each. After every effort, the girls rested until they again felt able to duplicate the same time and distance.

Several problems occurred in the Repetition Running activity. The students' participation and interest began to falter. The girls seemed to be less motivated to continue the aerobic program. Several students brought notes from their parents complaining of injuries or illness. Many girls faked injuries or illness while participating in the class.

To increase the interest and motivation of the girls, several changes were made. The first was to make the field smaller. Instead of the 440-yard running track

field, a 300-yard track was constructed. Another motivation technique was to use music while running. A large cassette-radio was placed in the center of the field. The girls continued the Repetition Running, but this time music was played. When the students stopped for the rest period, the music stopped. Using the music method, the students' interest began to increase.

Imaginative Running

Imaginative Running was also used to increase the eighth grade girls' cardiovascular scores. The classes were divided into teams. The teams competed against each other to see which group of students could be first to log enough miles to equal the distance between towns and various cities. The distance was 100 miles and each team was composed of ten girls. The youngsters enjoyed the challenge so much that they actually stayed around after school hours and used their free time to run and build up the miles needed for their team to win the race.

Rope Jumping

Rope Jumping improved cardiovascular aerobic endurance. By counting the number of jumps per minute, regulating rest period between different jumps and using some difficult high-energy jumps, helped improve the eighth grade girls' aerobic endurance. The writer's

Rope Jumping was used only on Wednesdays.

The first two weeks it was helpful to warm up by jogging in place 50 to 100 easy steps. The program included three warm-up jumps (to be completed slowly) and five basic jumps (to be completed at the rate of 70 to 75 jumps per minute). The Boxer's Shuffle and single-foot jumps were performed at the 70 to 75 per minute rate while double jump is restarted when missed and continued for the specified number of repetition. See Appendix J and Appendix K for Rope Jumping Repetitions and activities.

The final activity was the 12-minute run. This test was very successful because all of the eighth grade girls improved their cardiovascular fitness scores. However, the test was changed from the 440 yards track field to a 300 yards field. Music was used to help motivate the girls while they were running. The instructor let the girls select the music that they wanted to be played while the test was given. The students selected the music "We Are the World."

When this Aerobic Program was introduced to the eighth grade girls, the chief aim was to counteract the problems of lethargy, inactivity and low cardiovascular fitness scores which are so widely prevalent in American schools. The program was mainly a motivational program

for the school and the community, and also it was an attempt to encourage girls to examine more closely the benefits to be gained from regular exercise. The wide student acceptance of the aerobic program indicates that these objectives have been at least partially achieved.

AEROBIC 12 WEEKS PROGRAM

First Week	-	Orientation Testing: 12-Minute Run; Harvard Step
Second Week	-	Distance Running Testing
Third Week	-	Distance Running
Fourth Week	-	Interval Running
Fifth Week	-	Interval Running
Sixth Week	-	Fartlex Running
Seventh Week	-	Fartlex Running
Eighth Week	-	Repetition Running
Ninth Week	-	Repetition Running
Tenth Week	-	Imaginative Running
Eleventh Week	-	Imaginative Running
Twelfth Week	-	Imaginative Running Testing

Chapter IV

Results

Measuring the progress made toward achieving the practicum objectives enabled the writer to appraise the success of the Aerobic Program. Not all of the objectives were measured with the same degree of accuracy. However, success in achieving a desirable mode of conduct, because of the abstract nature of such objective, was difficult to measure. A student's progress in running speed was measured with a high degree of accuracy with reliable instruments, but the student's future attitudes toward cardiovascular exercise must be measured more subjectively by observation.

The physical education instructor was responsible for the evaluation of the students. The first evaluation was the weekly turning in of their point charts. Each student was required to obtain a minimum of 30 points per week. The charts were turned in every Wednesday and returned to the students on Thursday.

For 30 points or more the students received an "A." For a "B," the students had to obtain 25-29 points. To receive a "C" the points were 22-24. The grade "D" requires 20-21 points. All under 19 points received an "F."

All of the girls obtained the 30 points goal every week and they processed a class average of 33 points. The top achiever obtained a 54 points weekly average.

The final evaluation occurred at the end of 12 weeks. The test scores for the target group showed an overall improvement. The AAHPER Youth Physical Fitness Cardiovascular Test was the instrument used for the post-test. This is a standardized test because the norms and specifics for giving the test have been established. Scores for this test are easily interpreted because it was compared to scores made by a large number of students on the same test.

The "super" group improved their scores by 20% and higher. Each student in the "super" group received the Cardiovascular Fitness Award, and all had a score of 85% or higher.

The projected improvement for the "basic" group was 15%. However, 50% of the girls in the "basic" group doubled the projected improvement scores. Also, all of the "basic" group of girls raised their scores by 20% and higher. Three girls in the "basic" group scored high enough to receive the Cardiovascular Fitness Award.

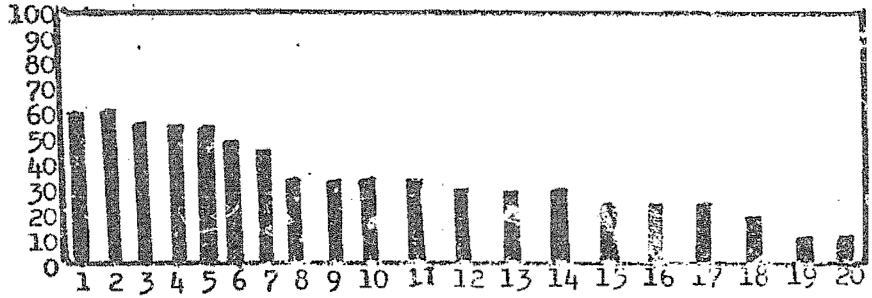
The test scores were recorded in permanent form so that they can be put to use in the future. The results were useful in measuring individual progress, in

comparing performance levels with nationwide standards, in developing programs of activities which helped raise levels of cardiovascular fitness of the school population.

Table 2

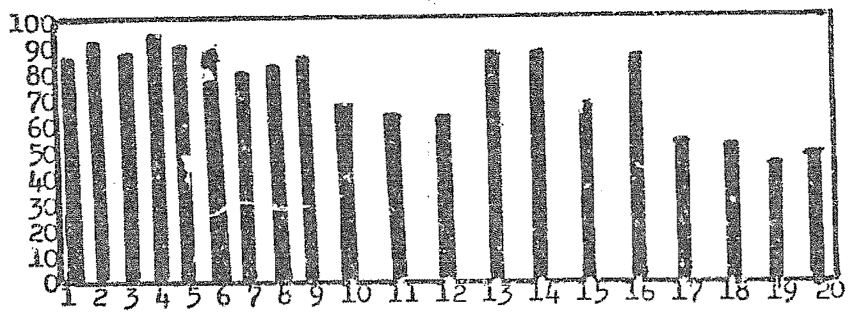
The Target Group Progress Scale

Pre-test:



Writer's Projective Outcome:

Final Outcome:



Chapter V

Recommendations

There are no immediate plans to develop a handbook for this program at this time because of the limited amount of experimentation that can be done in 12 weeks. An issue as important as this needs years of study comparison.

However, the program will be a permanent part of the physical education curriculum for the school. Patches would be awarded to the students achieving 30 points per week, another patch for 50 points, and a special "Century Club" emblem for 100 points. Of course, it would be made clear to the students that the "Century Club" is not for everyone. No one needs to feel left out for not getting in. Such intense level of exercise is primarily for athletes developing their "staying power." But the entire student body, except for those medically screened out, should be motivated to go for the 30 and 50 patches. The patches are used as awards as a means of motivating and increasing participation and stimulating and maintaining interest. Some physical educators feel that extrinsic awards detract from the objectives of the program because they

encourage participation for a reward rather than for the inherent values and enjoyment of play. But these aerobic patches would serve as recognition of achievement and will have insignificant monetary value.

This aerobic program can be administered in the higher grades of the elementary schools. When a student is in the fifth and sixth grades, or ages 11 or 12, it is time to introduce some reasonable, semiformal fitness program. This age needs a program that is interesting and varied enough to stave off boredom. It is exactly when the aerobic "equalness" begins to change. The boys continue to improve in their endurance and the girls to level off and stabilize. For this reason, the aerobic points program can be successful in the elementary schools. The recommended points for students 10 to 12 years of age is 24 points per week.

This program is being studied to be used in the school's Community School Conditioning Class. The class is offered three evenings a week. The students are16 years old or older. The class will join the International Research Society (AIRS). People from all over the world who are exercising regularly are encouraged to join this society so that the results of regular exercise can be more extensively and objectively evaluated. Members will receive a blank exercise log that they can fill out

daily. AIRS will determine the number of points they can earn each month. That information will be stored in the AIRS data bank. Each member will receive a summary of his or her monthly activity for personal files, along with a research report and newsletters from the Aerobic Activities Center. In other words, AIRS can enable a student to become a correspondent member of Aerobic Activities Center. Periodically, the student will be asked to complete a health questionnaire, so that the effect of the exercise program can be documented.

This aerobic point program can be used in high school and college sports programs. For atnletic conditioning, at least 50 points per week off season, and at least 100 points per week during the season. Many athletes in training do considerably more, earning up to 300 and 400 points per week.

Many pro teams in the American Foothall League and the National Football League teams use the 12-minute test as part of their summer conditioning or testing programs. The Dallas Cowboys, for example, encouraged aerobic training during the off-season last year and required all of their players to run 1.50 to 1.75 miles in 12 minutes, according to the requirements of their position. The Cardiovascular Endurance Training helped players

outlast the opposition and also reduced the injuries that come from playing while fatigued.

References

Alvarez, E. (1973). Eating away precious minutes. President's council on physical fitness and sports. (pp. 2-4). Washington, DC: AAHPER.

Bassles, T. J. (1975). Marathon running and immunity to heart disease: A study on running and heart disease. Sport's Medicine, 12, 4-6.

Bogert, L. T., Briggs, G. M., & Calloway, D. H. (1977). Overweight and underweight. Nutrition and physical fitness (pp. 324-328). Washington, DC: Saunders.

Cooper, K. H. (1982). Fitness testing and categories. The new aerobics (pp. 44-49). New York: Bantam.

Cooper, K. H., & Mildred, L. M. (1983). Warming up. Aerobics for women (pp. 56-61). New York: Bantam.

Cobin, C. B., & Lindsey, R. (1979). Cardiovascular fitness. Fitness for life (pp. 13-15). New York: Bantam.

Dodge, R. E. (1976). Guidelines in management of the exercising patient. Journal of AMA, 4, 4-8.

Fix, J. F. (1977). Getting good at it. The complete book of running (pp. 81-86). New York: Perigee.

Hunsicker, P., & Rieff, G. G. (1976). Recording test scores. Youth fitness test manual (pp. 3-9). Washington, DC: Saunders.

Joan L. (1981). Family running. Running free (pp. 26-29). New York: Perigee.

Ewinnick, J. P. (1979). Cardiorespiratory endurance. Movement experiences and development (pp. 32-36). New York: Saunders.

Appendices

Appendix A

STUDENT POINT CHART

Name _____

Grade and section _____

MONDAY	Event Miles _____	Points _____
TUESDAY	EVENT Miles _____	Points _____
WEDNESDAY	Event Miles _____	Points _____
THURSDAY	Event Miles _____	Points _____
FRIDAY	Event Miles _____	Points _____

TOTAL WEEKLY POINTS _____

Appendix B

THE AEROBICS CHART FOR JR. HIGH SCHOOL GIRLS

(Running Program)

Week	Distance (mile)	Time (minutes)	Freq/wk	Points /wk
1	1	17:00	5	5
2	1	14:00	5	5
3	1 1/2	22:00	5	7 1/2
4	1 1/2	20:00	5	15
5	1	10:00	5	15
6	1 1/2	19:00	5	15
7	1 1/2	18:00	5	15
8	2	24:00	5	20
9	1 1/2	14:30	4	24
10	1 1/2	13:30	4	24
11	2	23:00	4	24
12	1 1/2	13:00	4	24

Rope Skipping

Week	Duration	Freq /wk	Points /wk
1	2:30	1	-
2	5:00	1	2
3	7:30	1	3
4	8:00	1	3 1/2
5	10:00	1	4
6	12:30	1	5
7	14:00	1	6
8	15:00	1	7
9	16:00	1	8
10	17:00	1	9
11	18:00	1	10
12	20:00	1	12

Heart Rate Scale

Name _____ Section _____ Date _____

LABORATORY THREE

Effectiveness of the O_2 Transport System

This laboratory is designed to determine how efficiently heart, blood vessels, and lungs perform at rest and during muscular activity. It must be remembered that environmental and personal factors affect heart rate (HR). Thus, heart rate readings will vary from one observation to another. To assure reliable results during the following procedures, heart rate must be determined with care and precision. External and psychological factors should be controlled to avoid their contaminating effects. To obtain heart rate count pulse for 30 seconds and multiply by two.

A. EVALUATION OF RESTING HEART RATE

Sit relaxed for three minutes and then take heart rate for three trials. Take average and circle your average heart rate on the scale below.

Trial	Heart Rate
1	
2	
3	
Average heart rate	

RESTING HEART RATE SCALE[3]

45 – – 50 – – 55 – – 60 – – 65 – – 70 – – 75 – – 80 – – 85 – – 90 – – 95

Excellent	Good	Average	Poor

B. HEART RATE CHANGES IN DIFFERENT POSTURAL POSITIONS

Record heart rate for each of the following activities. Maintain each activity for three minutes, and record on the bar graph below.

Activity	Heart Rate
Sitting	
Lying with feet elevated	
Standing at attention	
Slow walk	

Appendix D

12 WEEKS HEART RATE CHART

RESTING HEART RATE AND HEART-RATE RECOVERY CHART

Pretraining
Date: _____

1. Resting
   H.R. ____ × 6 = ____
   (10 sec.)
2. Immediately after exercise
   H.R. ____ × 6 = ____
   (10 sec.)
3. After 2 min.
   H.R. ____ × 6 = ____
   (10 sec.)
4. After 3 min.
   H.R. ____ × 6 = ____
   (10 sec.)
5. After 4 min.
   H.R. ____ × 6 = ____
   (10 sec.)

After Eighth Week
Date: _____

1. Resting
   H.R. ____ × 6 = ____
   (10 sec.)
2. Immediately after exercise
   H.R. ____ × 6 = ____
   (10 sec.)
3. After 2 min.
   H.R. ____ × 6 = ____
   (10 sec.)
4. After 3 min.
   H.R. ____ × 6 = ____
   (10 sec.)
5. After 4 min.
   H.R. ____ × 6 = ____
   (10 sec.)

After Fourth Week
Date: _____

1. Resting
   H.R. ____ × 6 = ____
   (10 sec.)
2. Immediately after exercise
   H.R. ____ × 6 = ____
   (10 sec.)
3. After 2 min.
   H.R. ____ × 6 = ____
   (10 sec.)
4. After 3 min.
   H.R. ____ × 6 = ____
   (10 sec.)
5. After 4 min.
   H.R. ____ × 6 = ____
   (10 sec.)

After Twelfth Week
Date: _____

1. Resting
   H.R. ____ × 6 = ____
   (10 sec.)
2. Immediately after exercise
   H.R. ____ × 6 = ____
   (10 sec.)
3. After 2 min.
   H.R. ____ × 6 = ____
   (10 sec.)
4. After 3 min.
   H.R. ____ × 6 = ____
   (10 sec.)
5. After 4 min.
   H.R. ____ × 6 = ____
   (10 sec.)

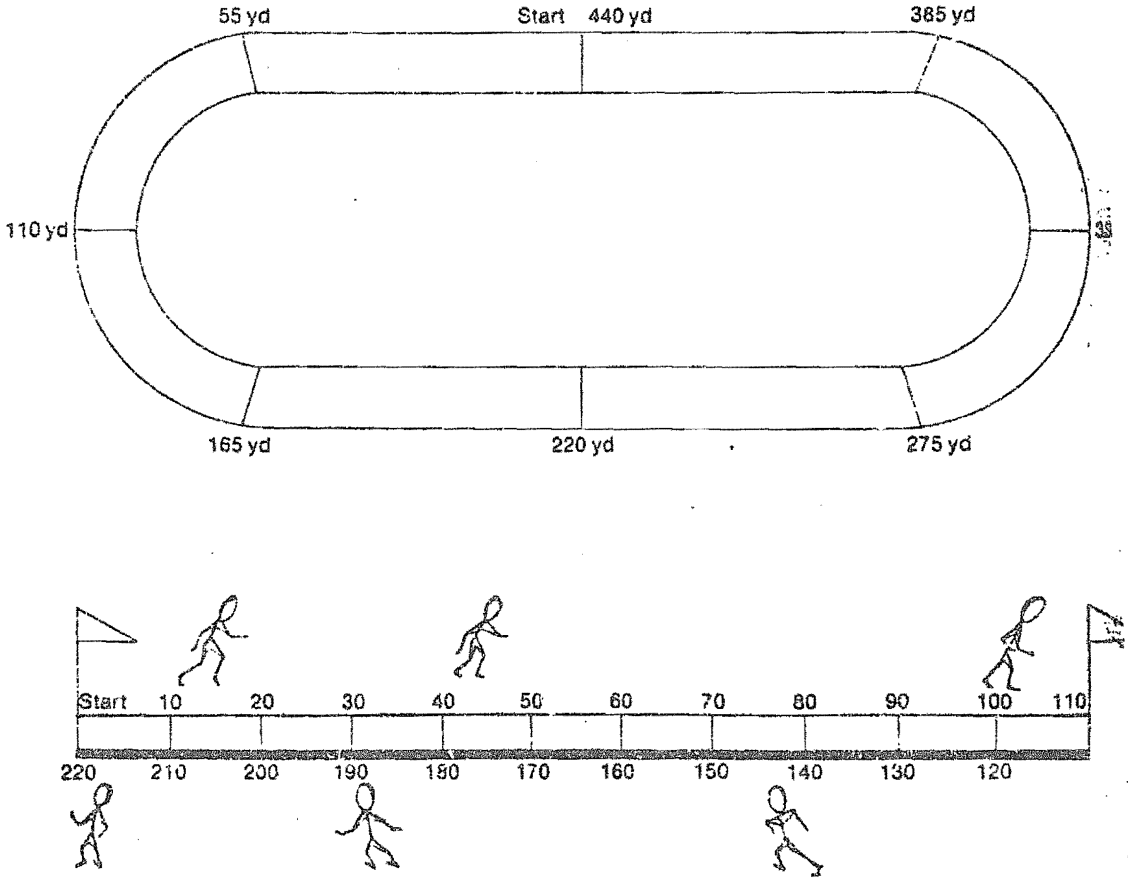


Figure 9-1. Nine- or Twelve-Minute Run-Walk Test Suggested Test Patterns
(440-yard track marked off in 55-yard intervals or 110-yard straightaway marked off in 10-yard intervals for distance scoring.)

Appendix F

Twelve-Minute Run Norms

TABLE 6B. 12-MINUTE/1½-MILE RUN FOR GIRLS, AGE 13 AND OLDER*

Percentile Scores Based on Age / Test Scores in Yards/Time

Percentile	12-Minute Run Yards	1.5 Mile Run Time	Percentile
100th	2693	10:20	100th
95th	2448	12:17	95th
90th	2318	13:19	90th
85th	2232	14:00	85th
80th	2161	14:34	80th
75th	2100	15:03	75th
70th	2050	15:26	70th
65th	2000	15:50	65th
60th	1950	16:14	60th
55th	1908	16:34	55th
50th	1861	16:57	50th
45th	1815	17:19	45th
40th	1772	17:39	40th
35th	1722	18:03	35th
30th	1672	18:27	30th
25th	1622	18:50	25th
20th	1561	19:19	20th
15th	1490	19:53	15th
10th	1404	20:34	10th
5th	1274	21:36	5th
0	1030	23:33	0

*From Texas Physical Fitness – Motor Ability Test.

Appendix G

Jogging Practice

Doing the Jogging Practice

- Work with a partner to practice the techniques of jogging.
- Jog about 100 yards twice while a partner stands behind you and checks your technique.
- On first jog, partner will check your feet and legs.
- On second jog, partner will check arms and body.
- Then have your partner jog twice while you evaluate your partner's technique.
- Have your partner use the Jogging Technique chart below to check whether you do each item correctly or whether you need improvement.
- Practice trying to correct your mistakes in technique, and then check each other again.
- Both you and your partner may jog more than two times if necessary.

Jogging Technique

Things to look for	Done Correctly	Needs Improvement
Feet and Legs		
Heel or whole foot hits ground first.	_____	_____
Push off with ball of foot.	_____	_____
Legs and feet swing and land straight ahead.	_____	_____
Stride is longer than walking stride.	_____	_____
Arms and Body		
Elbows bent properly (90°) with hands relaxed.	_____	_____
Arms swing straight forward and backward.	_____	_____
Head and chest up.	_____	_____
Only a slight body lean.	_____	_____

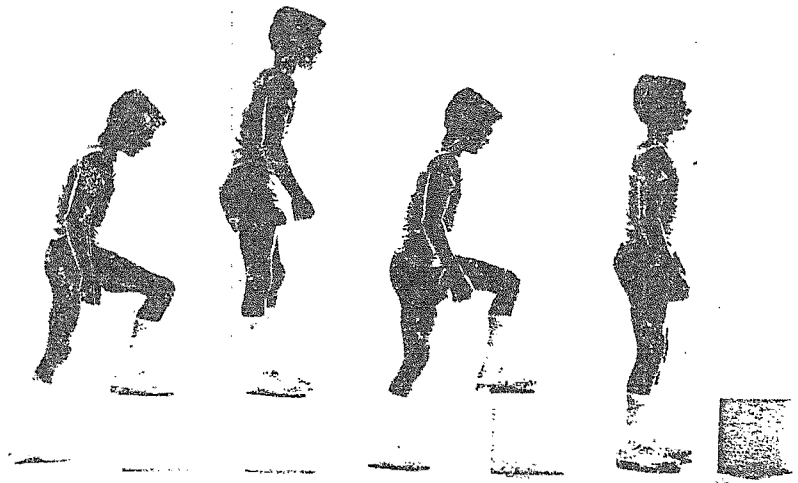
Appendix H

Harvard Step Test

Another good way to evaluate your cardiovascular fitness is the Step Test. The Step Test requires a step, bench, or chair 12 inches high. You will also need a clock or watch with a second hand.

Doing the Step Test

- To do this test, you step up and down on a 12-inch high bench for 3 minutes.
- You should exercise several days a week for several weeks before you take the Step Test.
- Step up with the right foot, then up with the left foot.
- Then step down with the right foot and down with the left foot.
- Repeat this 4-count (up, up, down, down) stepping 24 times each minute.
- Immediately after stepping for 3 minutes, sit down and have a partner find your neck pulse.
- Begin counting the pulse 5 seconds after you stop.
- Count for 1 minute.
- Write your pulse rate on the chart labeled "Cardiovascular Fitness Scores."
- When you record your results, use the first part of the chart only. You are only expected to do this test once in class unless your instructor tells you otherwise.
- Check your cardiovascular rating, and write your rating in the Cardiovascular Fitness Scores chart.



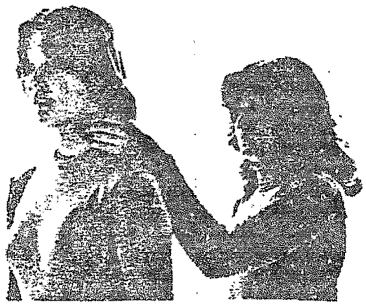
Self-Evaluation for the Future In class you may only have time to take this self-evaluation once. However, it is wise to retest yourself from time to time. The Cardiovascular Fitness Scores chart on the next page has provided space for you to retest yourself several times in the future.

Appendix I

Counting Heart Rate

Counting Heart Rate Before you can determine how exercise affects your body, you must learn how to take your resting pulse.

- Place your right index and middle fingers on the side of your throat near your Adam's apple. Press lightly and hold.
- You should feel a pulse with your fingertips. If you do not, keep moving your fingers until you can locate a pulse.
- Practice taking your own pulse. Use a clock or a watch to time each minute. Try it 2 times, and write the beats per minute in the chart below.
- Have a partner take your pulse. Try it twice, and write both beats per minute on the chart.



Resting Heart Rate

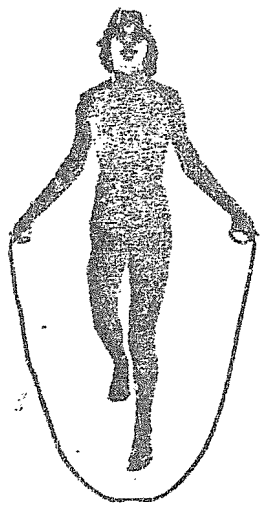
Trial	Beats per minute
Self Trial 1	_____
Self Trial 2	_____
Partner Trial 1	_____
Partner Trial 2	_____

Warm-Up and Cool-Down Affect Heart Rate Warming up and cooling down are very important, especially for cardiovascular-fitness activities. In this activity, you will practice warming up, doing an exercise, and then cooling down. You will measure your heart rate after each step so you will see the change in heart rate. The first exercise will show you the value of warming up because you start increasing your heart rate slowly. After the second exercise, you will stop suddenly so you can see how high your heart rate will stay if you do not cool down. After the third exercise, you will walk around to cool down so you can see how quickly your heart rate slows as you cool down.

Rope Jumping

Rope Jumping There are many kinds of rope jumping. Some are very simple, and some are very difficult. Before you begin a rope jumping program, it is important to learn some of the different rope jumping skills. The more different ways you can jump rope, the more interesting it will be. The following is a simple rope jumping program for beginners. If you are interested in doing rope jumping as part of your regular exercise program, you should read more about it in Curtis Mitchell's *Perfect Exercise: The Hop, Skip, and Jump Way to Health,* Simon and Schuster, 1976. After you have learned the different jump rope steps in this program, do them for the full time without stopping. If you cannot do the entire program without stopping, you may want to jog in place until you are rested enough to continue.

Exercise and Rate	Length of Time
Jog Step (120 turns per minute)	1 minute
Left Side Swing (120 turns per minute)	1 minute
Right Side Swing (120 turns per minute)	1 minute
Two-Foot Hop (130 turns per minute)	2 minutes
Rest (walk around in circle)	3 minutes
Jog Step (120 turns per minute)	1 minute
Two-Foot Alternate High Hop (90 turns per minute)	1 minute
Left Side Swing (120 turns per minute)	1 minute
Right Side Swing (120 turns per minute)	1 minute
Two-Foot Hop (130 turns per minute)	1 minute

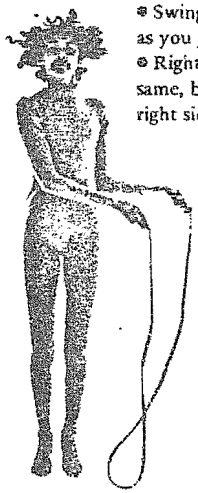


Jog Step

- Jump with one foot, then the other

Two-Foot Hop

- Hop on both feet with each rope swing.
- Beginners may hop twice with each rope swing.
- For two-foot alternate high hop, lift knees high for every other hop.



Left Side Swing

- Swing rope to left side as you jump beside it.
- Right Side Swing is the same, but rope is swung to right side.

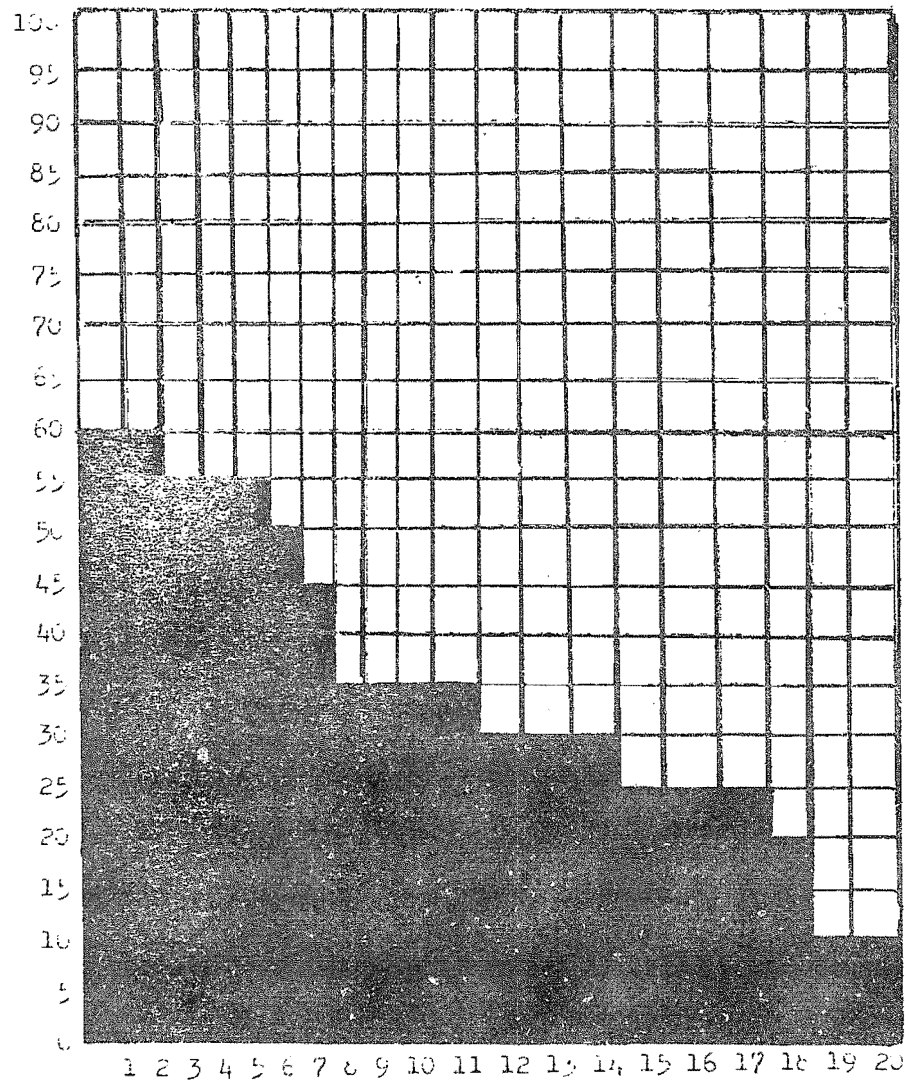
Appendix K

ROPE JUMPING PROGRAM

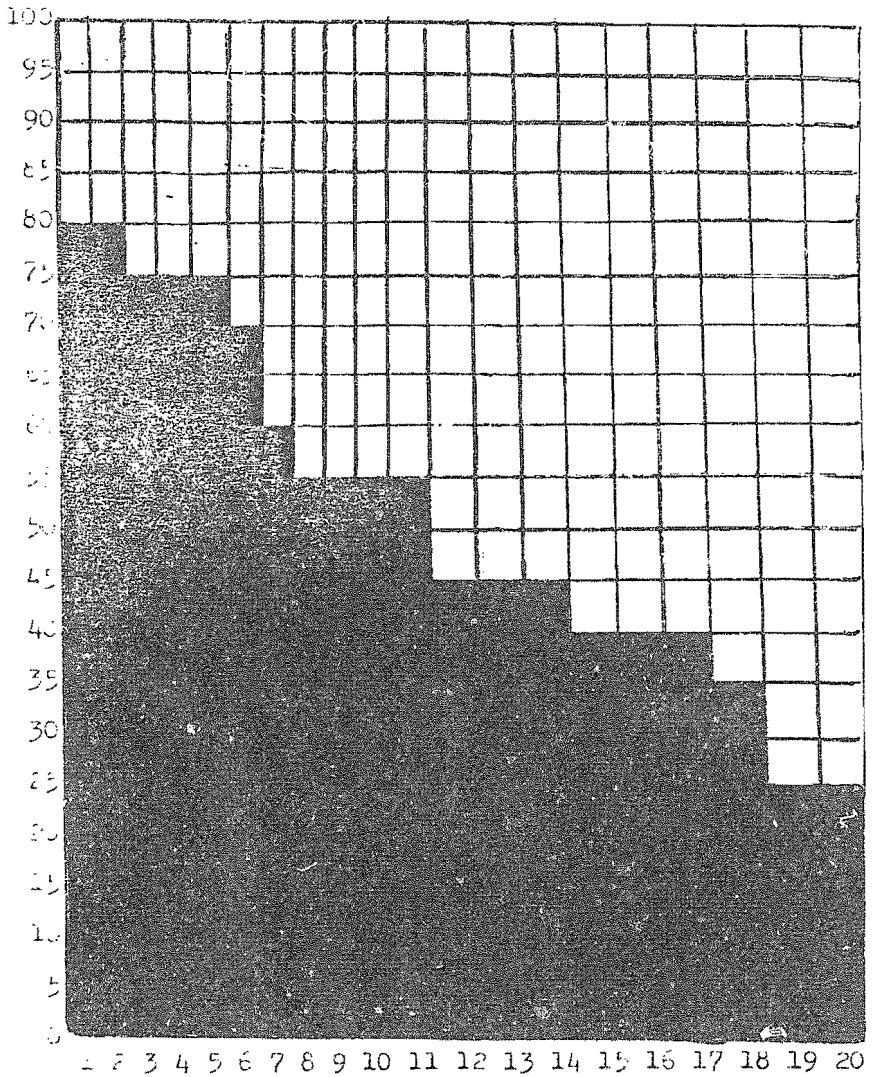
WEEK	EXERCISE	SETS	NO JUMPS	REST BETWEEN
1	Warm up jumps	1	15	Continuous
	Basic five jumps	1	15	2 minutes
	Practice session	1	15	15 minutes
2	Warm up jumps	1	20	Continuous
	Basic five jumps	1	20	2 minutes
	Practice session	1	20	15 minutes
3	Warm up jumps	1	25	Continuous
	Basic five jumps	1	25	90 seconds
4	Warm up jumps	1	25	Continuous
	Basic five jumps	2	15	90 seconds
5	Warm up jumps	1	25	Continuous
	Basic five jumps	2	20	90 seconds
6	Warm up jumps	1	25	Continuous
	Basic five jumps	2	25	60 seconds
7	Warm up jumps	1	25	Continuous
	Basic five jumps	2	35	60 seconds
8	Warm up jumps	1	25	Continuous
	Basic five jumps	3	40	60 seconds
9	Warm up jumps	1	25	Continuous
	Basic five jumps	3	45	30 seconds
10	Warm up jumps	1	25	Continuous
	Basic five jumps	3	50	15 seconds

Appendix L

THE TARGET GROUP



PROJECTED IMPROVEMENT



Learning How to Jog

Techniques of Jogging

Jogging is an activity that many people enjoy. More than 6 million people in the United States jog for exercise. Many more people could learn to enjoy this excellent cardiovascular exercise if they would learn how to jog properly. If you plan to start jogging, practice it correctly, and make sure you try jogging long enough to give it a chance. Jogging becomes much more enjoyable after your skill and endurance improve.

Techniques of Jogging

Warm Up by Doing Fast Walking and Slow Jogging You should walk fast or jog slowly for at least 2 minutes before speeding up to your normal pace.

Learn Your Own Best Pace Learn how fast or slow you should run to raise your heart rate to your threshold of training, as explained in Chapter 4. This pace is different for each individual. Find your own pace, and do not try to run at someone else's pace.

Foot Placement The foot action for jogging is not the same as for fast running. In fast running, your weight is more on the front of your foot; in jogging, you land on the heel or on the entire foot. Then you rock forward and push off with the ball of the foot, followed by the toes. Failure to do this may cause sore shins or calves.

Leg Movement Swing your legs and feet straight forward. Do not let the feet turn out to the sides. Feet and legs out of alignment cause unnecessary strain on the joints and muscles.

The Stride When jogging, step farther than your normal walking step.

The Arm Swing Swing your arms straight forward and backward; do *not* swing them across your body. Your arms should be bent at the elbows, and the hands should be relaxed. Try to keep the shoulders relaxed.

Using the Body Your trunk should remain fairly straight when jogging. Do not lean forward as you would in a fast sprint.

Cool Down After Jogging or Running Keep moving to allow your muscles to help pump the blood in your legs back to your heart. Walking around for a while is better than sitting or lying down at the end of your run.

Avoid Running on Hard Surfaces If possible, run on a running track, grassy places, or dirt paths that are easy on the feet and legs. If you jog indoors, wooden floors are easier on the feet and legs than concrete.

The following activity will give you an opportunity to try these jogging techniques.

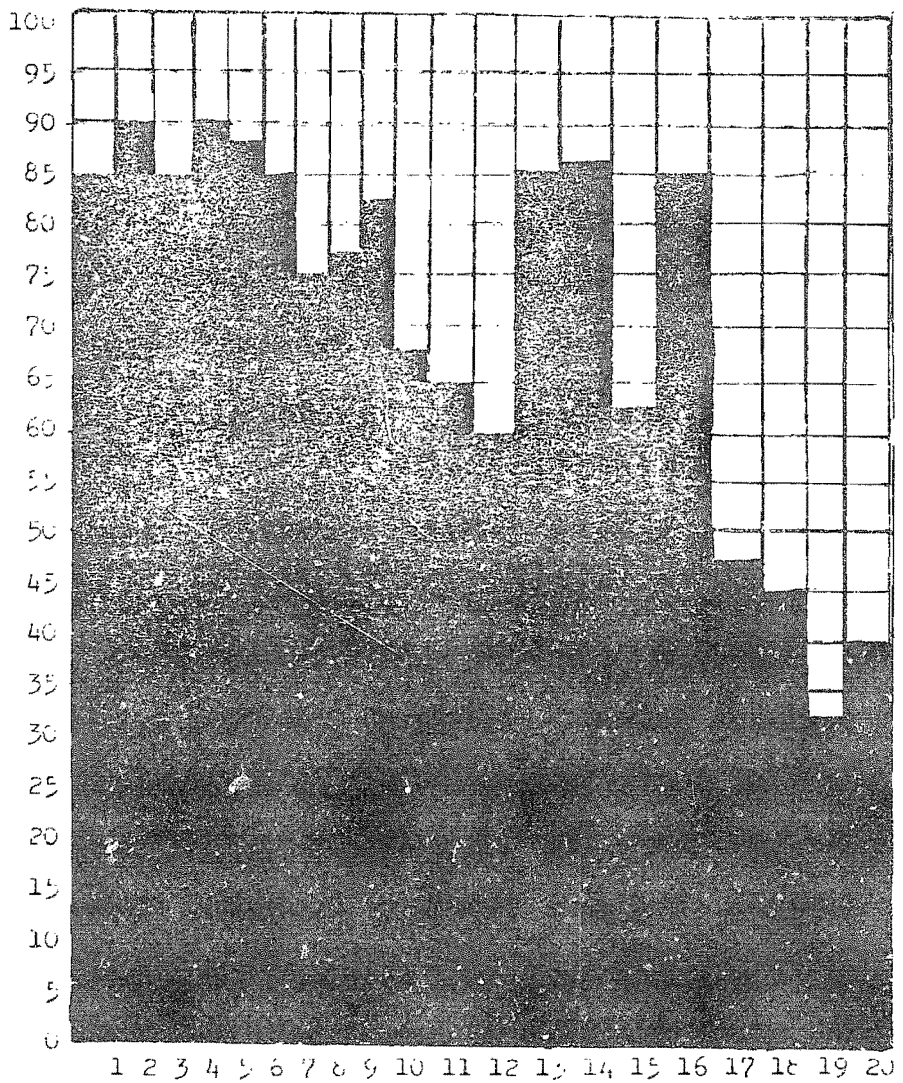
Appendix O

THE TARGET GROUP 12 MINUTES RUNNING TEST

STUDENTS	AGE	YARDS	PRECENTAGE
1	14	1970	60
2	13	1920	60
3	13	1869	55
4	13	1865	55
5	14	1860	55
6	13	1850	50
7	13	1845	45
8	14	1750	35
9	13	1748	35
10	13	1725	35
11	13	1722	35
12	13	1690	30
13	13	1689	30
14	13	1670	30
15	14	1645	25
16	13	1640	25
17	15	1625	25
18	13	1504	20
19	13	1440	10
20	13	1424	10

Appendix P

Final Outcome of Target Group



Harvey Cooper

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