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DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
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By

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* * * * *

The Ohio State University
1969

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I. INTRODUCTION

Statement of the problem

A myriad of objectives for physical education have been repeatedly discussed in the classroom, at professional meetings, and in the literature, but most physical educators accept the division of objectives into four developmental domains: physical, intellectual, social, and psychological. Since the individual's self-realization is the ultimate goal in any educational setting, these domains must be viewed in relation to the needs of the participant. The physical educator addresses this task for the most part by teaching skills and strategies designed to improve some aspect of performance. To what extent this approach affects behavioral development and meets the stated objectives is a question often asked and speculated upon but less frequently rigorously investigated. If physical educators are to claim that their programs influence behavioral development, at least some objective evidence of this influence must be provided.

Such investigations are necessarily fragmented affairs, focusing on one type of activity and on one or two of the developmental objectives. These restrictions reduce the applicability of the findings, but the magnitude of investigating the effects of all kinds of physical activities on behavioral development in general is prohibitive. Therefore, specific problems must be identified and investigated. One of these problems concerns the influence of physical conditioning on affective
Physical conditioning is a physical education activity which acts as one of the bases for several other activities as well as being somewhat of an entity. The affective aspect in behavioral development—i.e., how the individual feels about himself, others, and other concepts—bridges the social and psychological domains while remaining relatively distinct from cognitive learning.

Ever since the origin of the body-mind concept, physical conditioning has been associated with various social-psychological outcomes. In his survey of relevant literature, Hammett included the speculative work of Hippocrates, Aristotle, and Plato as well as Aldous Huxley's criticism of the failure of psychological theories to consider the body as a causal factor in personality, feelings, and behavior. After reviewing both early and more current statements, he concluded that:

> Although there is a general agreement that psychological changes result from physical states, such as fitness and considerable claims rather vaguely documented, there are surprisingly few firmly validated data.

Recently, both Ulrich and Cogan added to the undocumented literature by reminding physical educators that physical conditioning affects an individual's feelings about himself.

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2 Ibid., p. 767.

Although such psychological and social-psychological concepts as personality, body image, and self-concept are appropriate bases for an investigation of this kind, attitude and attitude change theory provides a theoretical perspective which serves to reduce the complexity of the variables under consideration. By limiting this study to affective attitudes toward the self, the body, and physical fitness before and after a physical conditioning program, the theoretical perspective is further reduced and clarified.

The major purposes of this study are: 1) To determine the short-term effect of physical conditioning of male college students on affective attitudes toward the self, the body, and physical fitness; 2) To determine which attitudes vary most closely with changes in muscular strength, muscular endurance, and cardiovascular endurance; 3) To determine whether the conditioning experience itself rather than fitness development is the major factor in attitude change; 4) To explore the relationship between an individual's physical activity history and attitude changes and between socio-economic status and attitude changes; 5) To investigate the effect of cognitive learning on the affective attitude toward physical fitness.

Definitions

According to Clarke, there are three components of physical fitness: muscular strength, muscular endurance, and cardiovascular endurance. Mathews defined muscular strength as "the force that a muscle or group of muscles can exert against a resistance in one maximum effort."

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and muscular endurance as "the ability of a muscle to work against a moderate resistance for long periods of time."\(^5\) Cardiovascular endurance refers to the "capacity to supply oxygen to the working muscles" to achieve "the maximum level of metabolism;" it probably involves the respiratory function, muscular efficiency, and muscular strength and endurance as well as the cardiovascular function.\(^6\)

There is general agreement that an attitude is a behavioral disposition which involves a favorable or unfavorable evaluation of some concrete or abstract object reflecting both direction and intensity of feeling. Attitudes have both cognitive—i.e., a description of the object and its relations to other objects—and affective—i.e., the feeling of liking or disliking—aspects, and attitude patterns can become part of more inclusive goals known as values.\(^7\) An attitude is an "abstraction from a large number of related acts or responses."


\(^6\) Herbert A. deVries, *Physiology of Exercise for Physical Education and Athletics* (Dubuque: Brown, 1966), 204-05.


Although content, direction, and intensity are its most frequently noted dimensions, Rosenberg also listed importance, salience (time spent thinking about it), consistency, stability, and clarity.\(^9\) Katz divided attitudes according to four functions: adjustment, ego-defense, value-expression, and knowledge.\(^10\)

Theory

Attitude change theory is not well formulated. Insko's review of several theories emphasized the importance of reward, reinforcement, or need reduction and the importance of consistency.\(^11\) Consistency is somewhat supported by the argument that cross referencing ties form a structural balance of attitudes and attitude clusters making change in a single attitude difficult,\(^12\) but research findings indicate little generalization and a highly differentiated and compartmentalized organization of attitudes and values in each individual.\(^13\) Katz related conditions necessary to ensure change to the function performed by the attitude. For example, need deprivation and better paths to need satisfaction relate to the adjustment function, removal of threats and


\(^12\) Newcomb et al., *op. cit.*, pp. 115-53.

development of self-insight to the ego-defense function, and some degree of dissatisfaction with self to the value-expression function.¹⁴

Factors which influence attitudes range from "broad socio-cultural factors and pervasive environmental influences . . . [to] the nature of social relationships and interpersonal communication . . . [and finally to] factors . . . resident in the individual himself."¹⁵ Certain characteristics of the attitude itself obviously affect its susceptibility to change, including intensity of feeling, mass of stored information, importance, salience, stability, and clarity.¹⁶

Physical education has not provided an adequate theoretical explanation for the proposed relationship, although certain statements peripheral to attitude theory are relevant. Warren Johnson's organismic theory affords some basis for formulating hypotheses relative to children's attitudes. He theorized that the body image and self-concept of children will improve with improvements in the physical base of the personality. For children and adults late in life, body image and the self-concept are nearly equivalent, while the self-concept is not nearly so dependent upon body image in adulthood.¹⁷

¹⁴Ibid., p. 192.


¹⁶This is suggested, at least indirectly, by Newcomb et al., op. cit., pp. 89-94.

of the body image and the self-concept has been repeatedly demonstrated experimentally,\(^\text{18}\) although the self-concept which apparently encompasses the self-attitude is admittedly a complex phenomenon.\(^\text{19}\) The body image is also a complex phenomenon which does not necessarily correspond to the individual's state of physical fitness according to the recent work of Vincent and Dorsey. Only one of the three body image measures correlated significantly with grip strength, and none of the three measures correlated significantly with a step test. However, only one of the three instruments was purported to measure attitudes. The authors concluded that more adequate body image instrumentation is needed and that the body image consists of highly subjective psycho-physical experiences.\(^\text{20}\) Herod's literature review supported the use


\(^{19}\) See, for example, the excellent discussion in: Hans Gerth and C. Wright Mills, Character and Social Structure: The Psychology of Social Institutions (New York: Harcourt, Brace; and World, 1953), 84-106.

of sensory motor experiences to help develop a strong body image, but again body image and body-attitude are not synonymous.

There have been several statements of a more general nature dealing with different forms of physical prowess as they affect the self-attitude. Isenberger found a low but positive relationship between motor ability and the self-attitudes of female college students majoring in physical education. Kraus and Raab theorized that insufficient physical activity may affect attitudes:

A proper interaction of various components form the personality. Inadequate physical activity, by creating emotional imbalance and tension through curtailment of outlets, may be a direct factor in impairing emotional and mental health.

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24 Hans Kraus and Wilhelm Raab, Hypokinetic Disease (Springfield: Thomas, 1961), 151.
A theoretical explanation for the relationship between physical fitness-attitudes and physical fitness is lacking, but research by Kenyon and others suggests that attitudes toward physical activity are generally positive and not related to active participation of any kind. Drawing on Campbell's attitude formation theory, it is probable that cognitive changes concerning physical fitness influence affective attitudes toward physical fitness.

It is hypothesized that changes in affective attitudes toward the self, the body, and physical fitness are moderately affected by improvements in muscular strength, muscular endurance, and cardiovascular endurance for male college students, but the complexity of other influences acting on these attitudes minimizes these effects. It is also hypothesized that cognitive changes concerning physical fitness without attendant physiological changes cause observable improvements in affective attitudes toward physical fitness.

Rationale

It is difficult to isolate the affective aspect of an attitude from its broader orientation, because it is not an independent phenomenon. In addition to the affective and cognitive aspects, there may be behavioral and normative components. However, it is practical to treat one aspect as if it were a distinct entity as long as recognition

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25 Letter from Gerald S. Kenyon, Associate Professor of Physical Education, University of Wisconsin, February 4, 1969.

26 Campbell, loc. cit., pp. 9-10.
is given to interrelationships.\textsuperscript{27}

Although the self-concept has both cognitive and affective components and three different theoretical orientations—i.e., clinical, experimental, and social-psychological—the affective component of the social-psychological approach involves the self "as an object toward which one has positive or negative feelings."\textsuperscript{28} Therefore, the self can be viewed as an attitude object which is similar to other attitude objects with the following exceptions: 1) It is an important attitude to most individuals; 2) There is a characteristic set of emotions associated with it; 3) Ego-involvement and defense mechanisms are related to it; 4) It has a reflexive character which creates a unique perspective and a permanence not shared by other attitude objects.\textsuperscript{29} This approach is more consistent with the classic work of George Herbert Mead than other approaches such as the self-concept and self-image.\textsuperscript{30}

\textsuperscript{27}Ibid., p. 12.


\textsuperscript{29}Rosenberg, op. cit., pp. 8-14. See also: Newcomb et al., op. cit., pp. 141-45.

The body can also be viewed as an attitude object, and at least one study included such a scale.31 Again, there are both cognitive and affective components,32 and at least seven different psychological processes are involved in the formation of one's body-concept.33 At least eight different interpretations of the body-concept exist in the literature, but by isolating the affective component, the body-attitude becomes the central factor, termed "body-esteem" by Kenyon.34

31 Kenyon, Values, pp. 39-41, 190.
32 J. de Ajuriaguerra, "Discussion," Wapner and Werner, op. cit., 85, 100. See also: Witkin, loc. cit., p. 23.
33 Heinz Werner, "Introduction," Wapner and Werner, op. cit., p. 3.
34 Kenyon, Values, p. 40.
II. REVIEW OF THE LITERATURE

This review is limited to experimental studies using either a before-and-after design or a post-test design to determine the effect of physical conditioning on those social-psychological variables in any way related to affective attitudes toward the self, the body, or physical fitness. The studies are grouped according to the characteristics of the subjects.

Normal subjects

Gasser investigated the effect of improvement in weight training on the self-concept of 131 male college students. Subjects were divided into four groups based on their weight lifting improvement over an eight week period with each group representing a different level of improvement. The self-concept instrument consisted of a body-attitude scale and a body-related semantic differential technique, both of which were designed by Gasser; the instrument was reported to have good reliability and face validity. Significant changes in self-concept as measured by pre-post test differences were observed among the four groups, and self-concept improvement means correlated with amount of success in weight training for the four groups. An argument was presented for the use of body-perception measurement to evaluate the self concept.¹

McPherson and his associates studied two groups of post-infarction cardiac patients, nine "experienced normal exercisers" who were thirty-three to forty-eight years of age, and a control group before and after a two day/week twenty-four week exercise program. Results for the cardiac patients are reported below. The instruments included Cattell's Sixteen Personality Factor Questionaire, The Manifest Anxiety Scale, a semantic differential technique designed to measure "me as I typically am," and a Likert attitude scale designed to measure attitudes toward exercise and physical activity. Although the normal group's physical fitness improved, the only significant social-psychological improvement was a decrease in anxiety. McPherson noted that test results for the normal exercisers could have been affected by these differences: 1) They were younger than the post-infarction patients; 2) They had high pre-test scores; 3) They increasingly lost interest in the exercise program.

In a study of Russian radiotelegraph operators, Petrushevskii observed that work efficiency and psychological functioning improved after ten weeks of training in gymnastics, handball, swimming, and track and field. Psychological tests were limited to letter correlation, digit span, and numerical problem solving which are considered to be indirect measures of the degree of anxiety. Greatest improvement

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was registered for those who had low fitness scores before participating in the program.  

Anderson constructed a forty item attitude scale to measure attitudes toward physical conditioning following a six week conditioning program. Using eight sections of ninth grade girls as experimental subjects and controls, she found no significant difference between the responses of the two groups. However, she only tested these groups after the conditioning program and therefore was not able to observe changes in the two groups.

Low fitness subjects

Tillman studied fifty high school junior and senior males who scored in the lower fifteen per cent on a two item physical fitness test. The experimental group of twenty-six boys completed a nine month physical fitness program while the control group of twenty-four boys attended regular physical education classes. Although the experimental group significantly improved on the fitness items, they did not significantly improve on either Cattell's personality test or the A-S Reaction Study test and only showed a significant change on one of nine parts of the Kuder Preference Record. All tests were administered both before and after the

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Stroble designed a thirty day program of Royal Canadian XBX exercises for twelve women majoring in physical education who had low physical fitness indices. She found increased fitness scores and higher scores on the Q-sort and Edwards Personal Preference Schedule, reflecting a more secure body image and to a lesser extent a more positive self-concept and positive personality trait changes. 6

Cardiac patients

The McPherson study cited above also involved two groups of post-infarction cardiac patients, one of which attended an exercise program twice weekly for twenty-four weeks and the other of which participated in a weekly recreational swim for twenty-four weeks. Instruments included two personality tests, a self-attitude semantic differential test, and a physical fitness-attitude scale. The pre-test results indicated that these subjects were more tense, aloof, taciturn, fickle, emotional, hurried, and aggressive and had less self control and self reliance than the normal group discussed above. Significant pre-post test improvements included physical fitness, their evaluation of "me as I

5 Kenneth Tillman, "Relationship between Physical Fitness and Selected Personality Traits," Research Quarterly, XXXVI (December, 1965), 483-89.

typically am," physical fitness-attitude, and personality characteristics.  

Hellerstein and his associates found a significant decrease in the depression score of the Minnesota Multiphasic Personality Inventory for twenty-nine cardiac patients after a physical conditioning program. Subjects also stated that they felt better after the program. Length of the program was not reported.  

Subjects with disabilities

Leighton and his associates evaluated ten mentally retarded male adults before and after an eight week physical fitness program of three two hour sessions per week. Physical fitness improved, but only the cardiovascular endurance change was statistically significant. Psychological evaluation included two intelligence tests, three personality tests, and a test for brain damage. Positive shifts in mental age and more positive self-concepts were observed.  

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7 McPherson et al., loc. cit., pp. 95-102.


Vaughn reported significant improvements in physical fitness, body image, self-image, and behavioral adjustments for thirty hospitalized male psychotics who participated for eight weeks in either a Royal Canadian Air Force 5BX Plan and weight training program or a daily program of organized vigorous games. Thirty subjects acted as controls. Instruments included two physical fitness measures, the Draw-A-Person Test, the M. A. C. C. Behavioral Adjustment Scale, the Sacks Sentence Completion Test, and an appearance inventory. The exercise group tended to score slightly higher than the games group, although both groups improved significantly in comparison to the controls.10

Warren Johnson directed research involving disabled children in the Children's Physical Developmental Clinic at the University of Maryland based on his organismic theory cited above. To test this theory, several studies were carried out.

Bonniwell used three different instruments to record body image changes before and after an individualized physical development program consisting of eight one hour sessions. The subjects were sixteen children with various neuro-motor problems. The instruments were the Draw-A-Person test, a body image semantic differential technique, and a projective type sociometric test. A "definite relationship" was reported

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between improvement in body image and participation in the program.\textsuperscript{11}

Belzer used an aniseikonic technique to measure body image of children with neuro-muscular problems. He found no difference between this group and a control group of physically superior children but suspected that requiring them to be tested while nearly naked may have affected their responses.\textsuperscript{12}

Laneve paired thirty-two subjects from a group of sixty-eight retarded boys ranging from eight to ten years of age. Both groups were pre- and post-tested using the Draw-Yourself Test and the Pupil Adjustment Scale. The experimental group experienced one hour of physical activity for eight consecutive Saturdays while the controls continued normal activity. There were no changes for either group on either test.\textsuperscript{13}

More recently, Johnson and his associates studied seventy-four children with various emotional or mental disorders before and after a six week individualized physical development program which met twice weekly. Using three instruments developed especially for the program,


\textsuperscript{13}Ronald S. Laneve, "The Effect of Planned Physical Activity upon Body Image and Certain Behavioral Variables of Retarded Boys" (unpublished Master's thesis in physical education, University of Maryland, 1964).
different aspects of the self-concept were measured. Results included increased willingness to be with other children, increased willingness to be with the clinician, increased willingness to be with the father, and decreased real-ideal discrepancy on height. There were no controls.  

Summary

For the low fitness, cardiac, and disabled subjects, positive changes were consistently reported for self-related variables. There was also a trend toward favorable personality changes. Isolated positive changes such as physical fitness-attitude and mental age were also reported. Contradictory evidence was presented for body-related variables, but different measurement techniques could account for the differences.

For normal subjects, two studies reported no change in physical fitness-attitude, and one study found no change in self-attitude. Gasser observed a positive change in the self-concept as measured by body-related evaluation.

Definitive conclusions regarding the attitudes under investigation cannot be drawn from the available literature which lacks uniformity of subject characteristics, measurement techniques, and research design objectives and which utilizes parametric statistical techniques for ordinal data in many instances.

III. PROCEDURES

Design

Two experimental groups consisting of a total of forty-nine male college students and a control group of forty-eight male college students were pre- and post-tested for muscular strength, muscular endurance, and cardiovascular endurance and for affective attitudes toward the self, the body, and physical fitness. Between testing periods the two experimental groups experienced an eight week physical conditioning program consisting of four thirty minute periods weekly for twenty-seven subjects and two thirty minute periods weekly for twenty-two subjects. Daily lesson plans are summarized in Appendix II, but in general three objectives were planned: 1) Extensive interval training designed primarily to improve aerobic capacity (oxygen intake); 2) Circuit training designed primarily to improve muscular endurance and to a lesser extent cardiovascular endurance; 3) Some heavy resistance work designed to improve muscular strength.1

The control group experienced introductory volleyball instruction twice weekly for eight weeks. Twenty-two of the controls were assigned outside reading concerning physical fitness and were tested for retention of this information; reading material and the test are included in Appendix III.²

To control for a differential Hawthorne effect and for the differential effect of compliant subjects, the writer taught both experimental and control classes, and all subjects were informed that they were involved in a departmental experiment.³ They were also informed that grades for the course would not be based on fitness or attitude test results. However, to enhance motivation, they were notified that fitness scores would be posted. The attitude tests were coded to maximize the feeling of anonymity.

Subjects

Subjects for the experimental group which met four times weekly were enrolled on a volunteer basis during winter quarter registration for physical education classes at the Ohio State University. The "expedient choice" method of sampling was employed,⁴ whereby physical activity

²Students were assigned parts of Donald R. Hellison, "Conditioning Guide," Ohio State University, March, 1968 (mimeographed); these parts are reproduced in Appendix III.


histories were determined by interview prior to enrollment. This enabled a wide range of athletic backgrounds to be included in the sample. Subjects for the experimental group which met twice weekly were assigned to the writer as part of the required physical education program; the group consisted of those students who happened to select the hour that the writer was assigned to teach. In the same way, two volleyball classes assigned to the writer served as controls.

Experimental subjects ranged in age from eighteen to twenty-four with a median age of eighteen. Controls ranged in age from seventeen to twenty-five with a median age of eighteen. Both groups ranged in height from sixty-five inches to seventy-five inches with a median height of seventy-one inches. Experimental subjects ranged in weight from 125 pounds to 260 pounds with a median weight of 167. Controls ranged from 126 to 240 with a median weight of 160. Physical fitness and attitude comparisons are included in Chapter IV.

Physical fitness measurement

The problem was to find representative measures of muscular strength, muscular endurance, and cardiovascular endurance which could be administered in a short period of time.

Cooper's twelve minute run-walk test is a promising effort to translate results of a group cardiovascular test into maximum oxygen consumption data for each individual. This test was correlated with a
treadmill maximal oxygen consumption test for 115 male subjects, resulting in a correlation coefficient of .897.\(^5\)

For muscular strength, Fleishman's factor analysis showed that grip strength as measured by a manuometer is representative of muscular strength in general,\(^6\) but Borchardt found five specific groupings of muscular strength rather than one.\(^7\) Laubach and McConville reported a correlation coefficient of .508 between grip strength and total body strength.\(^8\) Since it is impractical to employ more than one muscular strength measure, it appears that grip strength could represent the approximate muscular strength of an individual when compared with himself.

For muscular endurance, pull-ups commonly correlate very well with batteries of motor fitness items,\(^9\) although Fleishman found muscular endurance of the trunk to be a separate factor.\(^10\) That muscular

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\(^10\)Fleishman, *op. cit.*, pp. 67-68.
strength and muscular endurance are not completely separate factors was pointed out by Clarke; there is a general relationship between strength and muscular endurance supported by specific correlations ranging from .41 to .84 for the relationship between seven upper body cable-tension strength tests and three indices involving push-ups and pull-ups.\textsuperscript{11}

Four tests were selected for the study: 1) Total run-walk distance in twelve minutes (for cardiovascular endurance); 2) Dominant hand grip strength (for muscular strength); 3) Maximum number of pull-ups (for general muscular endurance); 4) Maximum number of sit-ups in two minutes (for trunk muscular endurance). Each of these tests involves a motivational factor which has not been thoroughly researched,\textsuperscript{12} but test results were posted as announced in an effort to enhance motivation.

The following testing procedures were followed. The twelve minute run was scored in completed 220 yard laps within the allotted time. The best of two trials was recorded for grip strength. Sit-ups were performed with feet held flat on the floor, with knees flexed, and with

\textsuperscript{11}H. Harrison Clarke, \textit{Muscular Strength and Endurance in Man} (Englewood Cliffs: Prentice-Hall, 1966), 151, 154, 203.

hands clasped behind the head. Certain sources were critical of holding the feet, but the writer found that allowing the feet to be free caused a stability problem. Due to administrative time limitations, the two minute time limit was used despite one report of low correlations between two minute and untimed maximum sit-ups. Concerning pull-up grip, there are some differences in muscle involvement when different grips are used, and some evidence that the supinated grip results in higher scores. However, two factors support individual preference: 1) The comparison of each individual with himself; 2) The intended measurement of general muscular endurance rather than the muscular endurance of a specific muscle group.

Attitude measurement

There are several statements in the literature which evaluate the current status of attitude measurement techniques. Vernon


\[15\] Worden and Yessis, loc. cit., pp. 79-80.


\[17\] See, for example: Green, loc. cit., pp. 336-43; Newcomb et al., op cit., pp. 496-519; and Kenyon, Research Quarterly, pp. 567-68.
reviewed specific personality, attitude, and personal concept tests including projective techniques and major criticisms of these efforts. He concluded that more research is needed:

At the moment we know more about the weaknesses of tests than about their potentialities . . . they should be accepted at face value as samples of . . . self-concepts, etc., and the justifiable inferences that can be drawn from them determined by research. Simultaneously we need a more comprehensive psychological system of the trends . . . that underly behaviour patterns and self-concepts . . .

The Thurstone and Likert scales were criticized by Diab for the failure of a single score to adequately represent an attitude. Instead, he suggested the use of the Sherif and Sherif concept of latitudes of acceptance, rejection, and noncommitment in combination with a semantic differential technique. On the other hand, Oppenheim gave a qualified approval to the use of these scales:

. . . if we remember that equal score intervals do not permit us to make assertions about the equality of underlying attitude differences and that identical scores may have very different meanings, the Likert scale tends to perform very well when it comes to a reliable, rough ordering of people with regard to a particular attitude.


Insko criticized the Thurstone, Likert, and Guttman attitude scales as "poorly conceived assessment procedures" while favoring the semantic differential technique. He was also critical of the before-and-after research design because of the "uncertainty about pre-test interactions." However, both Hammett and Cattell argued that a before-and-after design is necessary to study the relationship between social-psychological characteristics and physical fitness development.

Kuhn advocated the use of direct rather than projective measures for measurement of the self-concept, because of the self-concept consists of "consciously-held, verbal plans of action." Kuhn and McPartland suggested the use of twenty brief, open ended responses to the question "Who am I?" in order to measure self-attitude.

Vincent and Dorsey reviewed body image measurement in relation to physiological responses. After collecting data from three of these tests, they concluded that more adequate body image instrumentation is needed. Regardless, the connection between these tests and attitude theory is questionable; only the Fisher-Cleveland Barrier Index was

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21 Insko, op. cit., pp. 345-46.


24 Kuhn and McPartland, loc. cit., pp. 68-76.

25 Vincent and Dorsey, loc. cit., pp. 1101-06.
purported to measure attitudes and then only for one dimension of the body image.  

**Self-attitude measurement**

Two techniques were selected to measure the affective attitude toward the self. Rosenberg's ten item Guttman scale, which resulted in a manuscript selected as co-winner of the American Association for the Advancement of Science Socio-Psychological Prize for 1963, was designed to measure self-esteem—i.e., direction and intensity of feeling about the self. (See Appendix I for all attitude and physical activity history measurement techniques used in this study.) Rosenberg administered his self-esteem scale to 5,024 high school juniors and seniors with the following results: For unidimensionality, this scale had reproducibility of ninety-three per cent, scalability (items) of seventy-three per cent, and scalability (individuals) of seventy-two per cent; For validity, Rosenberg found high correlations with the Leary scale, the "depressive affect" scale, a neuroticism test, symptoms of anxiety, and three sociometric ratings; For reliability, the scale yielded a test-retest correlation coefficient of .85. In addition, this instrument has the advantage of economy of time in administration.  

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26 Ibid., pp. 1102-03.
Coupled with this quantitative technique, two open ended questions which Vernon proposed to answer many of the criticisms of autobiographical materials were included for qualitative evaluation.\(^{28}\)

Therefore, direction and intensity of the self-attitude and to a lesser extent other dimensions of the affective component were measured. Stability of the self-attitude was examined by Rosenberg; he found that students with lower but not the lowest self-esteem have lowest stability scores.\(^{29}\)

**Body-attitude measurement**

The evaluative dimension of the semantic differential was selected for the measurement of body-attitude. Osgood and his associates worked extensively to evaluate the semantic differential technique and its applicability to attitude measurement. They found good validity and reliability coefficients but cautioned that there are no standard concepts or scales. Therefore, face validity is an important criterion.\(^{30}\) The semantic differential technique has shown increasing popularity with attitude researchers as noted above.\(^{31}\)

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\(^{28}\) Vernon, *op. cit.*, pp. 286-88.

\(^{29}\) Rosenberg, *op. cit.*, p. 152.

\(^{30}\) Osgood *et al.*, *op. cit.*, pp. 36-38, 124-95.

\(^{31}\) For other evaluations of its uses and limitations, see: Vernon, *op. cit.*, pp. 283-84; and Seymour Fisher and Sidney E. Cleveland, "Personality, Body Perception, and Body Image Boundary," Wapner and Werner, *op. cit.*, pp. 48, 62.
The pilot study, consisting of one concept and sixteen adjective pairs, was administered to ninety-six male college students to test for internal consistency. The final instrument was then administered twice within seven weeks to forty-three male college students to test for reliability. All respondents came from cluster samples selected largely by availability. The concept being evaluated, "My body as it really is," and four of the adjective pairs were taken directly from Kenyon's work. Three other adjective pairs used by Kenyon were revised by the writer for inclusion in the pilot study. From other adjective pairs that Kenyon used for different purposes, four pairs were taken and one pair was revised and included. In addition, four pairs were devised by the writer for the pilot study. For internal consistency, discriminative power for each adjective pair was computed. A comparison of mean scores for each pair between the upper and lower twenty-one per cent (a total of forty out of ninety-six responses) yielded discriminative powers ranging from a high of 2.45 (on a scale of seven) to a low of .85 as shown in Table 1. However, fifteen of the sixteen adjective pairs had discriminative powers in excess of 1.2. Therefore, these fifteen pairs were retained, and only one pair, "dirty--clean," was omitted from the final instrument. Using the non-parametric

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32Letter from Gerald S. Kenyon, Associate Professor of Physical Education, University of Wisconsin, October 4, 1968.

33Kenyon, Values, pp. 34, 190.

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<td>7</td>
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Spearman rank correlation coefficient for ordinal data, test-retest reliability of the final instrument was .78.

**Physical fitness-attitude measurement**

Two scales were selected to measure attitude toward physical fitness. Richardson designed a Thurstone scale to measure attitudes toward physical fitness and exercise. He modified the Thurstone procedure by using twenty judges who are professors of health and physical education rather than 200 or more judges as originally suggested by Thurstone. He also limited the sorting categories to five. References supporting the validity of these changes were included in the article. The value of each item represents its median score as determined from sorting by the judges. Only those items with low discriminative powers when comparing the twenty-fifth and seventy-fifth percentiles were retained, indicating good agreement among the judges. Two nineteen item equivalent forms resulted, and form A was selected by the writer for this study. The validity of this scale was provided by the argument that attitudes can be separated from objective judgments if the judges are given explicit instructions. For reliability, the test-retest method within a three week interval was used on a random sample of fifty college students drawn from 300 students who had taken the test. The resulting correlation coefficient was .83.  

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A twenty item Likert scale was devised by the writer in the summer of 1967 and administered to ninety-five male college graduates to determine whether differences in attitudes toward physical fitness exist among athletes who have continued to participate in some form of activity, non-athletes who still participate, and non-athletes who do not participate. Two scales were derived from the twenty items, the first measuring attitude toward physical fitness as a primary necessity in society and the second measuring attitude toward physical fitness as the primary purpose of exercise. The Kruskal-Wallis one way analysis of variance yielded a value of 10.42 for the first scale which was statistically significant beyond the .01 level of confidence and a value of 3.81 for the second scale which was statistically significant at the .02 level of confidence. In other words, these scales did differentiate among athletes-participants, non-athletes-participants, and non-athletes-non-participants.

For this study, the above scale was revised and reduced to fifteen items in an attempt to ensure unidimensionality. Only four items (1, 3, 4, 12) were retained without revision, and one of these (1) was a revised Kenyon item. One other Kenyon item used on the original instrument (11) was revised for this scale, and two revised Kenyon items (5, 9) were again altered for inclusion on this scale.

All Kenyon items were taken from Gerald S. Kenyon, "Six Scales for Assessing Attitude toward Physical Activity," September, 1966 (mimeographed). The published manuscript which is cited in an earlier footnote does not include the items.
Three original items (2, 6, 13) were revised, and five new items (including 7, 8, 10, 14) were added.

Reliability was determined by a test-retest of a convenient cluster sample of sixty male college students with four weeks between testing. Since the data are at the ordinal level of measurement, the non-parametric Spearman rank correlation coefficient was employed, yielding a value of .80. The Pearson product moment correlation coefficient for the same data was .89.

Using both the above sample and responses from forty physical educators, internal consistency was again determined by computing the discriminative power from a comparison of the mean scores of two groups, this time using the upper and lower twenty-four per cent (a total of fifty out of 105 responses). Discriminative powers ranged from 1.84 to .52 as shown in Table 2, but only one item fell below .90. Therefore, only one item, "People who lecture on the benefits of keeping 'in shape' should mind their own business," was omitted from the final scale. This was a new item and therefore had not appeared on the original instrument.

For validity, a known group of forty physical educators was compared with the above sample of sixty-five male college students. (Five respondents were not retested and therefore do not appear in the reliability sample.) Since the data do not meet the assumptions underlying parametric techniques, the Mann-Whitney U test was employed, resulting in a value of 1.04 which was statistically significant beyond the .30 level. It was obvious from written comments on many of the
## TABLE 2
DISCRIMINATIVE POWER OF LIKERT SCALE DESIGNED TO MEASURE ATTITUDES TOWARD PHYSICAL FITNESS

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<th>Score</th>
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<td></td>
<td>Low</td>
<td>25</td>
<td>9 12 3 1</td>
<td>2.85</td>
<td>1.59</td>
</tr>
<tr>
<td>8</td>
<td>High</td>
<td>25</td>
<td>1 7 17 7</td>
<td>3.64</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>25</td>
<td>2 5 16 2</td>
<td>2.72</td>
<td></td>
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<tr>
<td>9</td>
<td>High</td>
<td>25</td>
<td>4 5 16 2</td>
<td>3.48</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>25</td>
<td>1 14 1 8 1</td>
<td>1.76</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>High</td>
<td>25</td>
<td>2 7 16 7</td>
<td>3.56</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>25</td>
<td>2 12 8 3</td>
<td>2.48</td>
<td>1.08</td>
</tr>
<tr>
<td>11</td>
<td>High</td>
<td>25</td>
<td>14 11 4 1</td>
<td>3.44</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>25</td>
<td>2 12 5 6</td>
<td>1.60</td>
<td>1.84</td>
</tr>
<tr>
<td>12</td>
<td>High</td>
<td>25</td>
<td>1 1 11 12</td>
<td>3.36</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>25</td>
<td>2 7 5 11 1</td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td>13a</td>
<td>High</td>
<td>25</td>
<td>2 1 1 10 11</td>
<td>3.08</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>25</td>
<td>1 2 4 18 1</td>
<td>2.56</td>
<td></td>
</tr>
<tr>
<td>14 (13)</td>
<td>High</td>
<td>25</td>
<td>2 8 15 2</td>
<td>3.68</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>25</td>
<td>8 5 11 1</td>
<td>2.05</td>
<td>1.63</td>
</tr>
<tr>
<td>15 (14)</td>
<td>High</td>
<td>25</td>
<td>1 5 12 7</td>
<td>2.76</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>25</td>
<td>3 12 7 3</td>
<td>1.80</td>
<td></td>
</tr>
</tbody>
</table>

*This item was omitted from the final scale.*
questionnaires that the physical educators were not unqualified proponents of physical fitness--i.e., were not a true known group. A cognitive response--e.g., define vigorous, specify age levels--rather than an affective response was typical.

Since Kenyon criticized the Richardson scale for its "failure to account for the possible and indeed likely, multidimensionality of the domain," the Likert scale was evaluated for possible multidimensionality. Of the fifteen items, five (2, 7, 8, 10 14) seemed to stress the respondent's personal feeling--e.g., "I prefer . . . ;" "If I had to choose . . . ;" whereas the remaining ten items were stated in more cognitive terms--e.g., "People should . . . ;" "The need for . . . ." Therefore, a sample of fifty was selected at random from the 105 respondents noted above, and this sample was rescored by summing scores from the five items reflecting personal viewpoint and then summing the remaining ten scores. These scores were correlated using the Spearman rank correlation coefficient which yielded a value of .95. It appears that a significantly positive relationship exists between responses reflecting an affective aspect and those of a more cognitive nature on this scale.

Physical activity history and socio-economic status measurement

A questionnaire was designed by the writer to measure the extent of the subject's prior athletic involvement, the extent of the father's physical activity involvement, and socio-economic status as indicated by father's occupation.

37 Kenyon, Research Quarterly, p. 568.
Testing order

The five instruments were administered as shown in Appendix I to avoid set responses insofar as possible.
IV. ANALYSIS OF THE DATA

Pre-test comparisons

Pre-test scores for each of the eight quantitative variables were compared to determine whether experimental and control subjects in the three groups could be considered to be drawn from the same population. Because attitude data are ordinal in nature and the remaining variables failed to approach a normal distribution, a non-parametric technique was required to statistically compare the three groups.¹ Therefore, the Kruskal-Wallis one way analysis of variance was employed. The results are shown in Table 3, and the distributions are shown in Plates I and II.

The pre-test differences in six of the eight variables were statistically significant, and one other variable approached significance. Since statistical significance only indicates to what extent the observed differences will occur by chance and not to what extent the groups actually differ,² it is important to compare the medians and distribution differences. Rank means are also included in Table 3, because the Kruskal-Wallis test is based on ranks. In most cases, the


# TABLE 3

THREE GROUP PRE-TEST COMPARISONS FOR EIGHT VARIABLES

<table>
<thead>
<tr>
<th>Variable</th>
<th>Median</th>
<th>Rank Means</th>
<th>H</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4 Day</td>
<td>2 Day</td>
<td>Controls</td>
<td>4 Day</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pull-ups</td>
<td>5.5</td>
<td>6</td>
<td>6.25</td>
<td>45.78</td>
</tr>
<tr>
<td>Sit-ups</td>
<td>46</td>
<td>48.5</td>
<td>51.5</td>
<td>45.87</td>
</tr>
<tr>
<td>Grip Strength</td>
<td>124</td>
<td>122.5</td>
<td>123</td>
<td>47.83</td>
</tr>
<tr>
<td>12-min. Run</td>
<td>10</td>
<td>11</td>
<td>11</td>
<td>45.59</td>
</tr>
<tr>
<td>Physical Fitness-Attitude</td>
<td>41</td>
<td>40</td>
<td>36</td>
<td>54.55</td>
</tr>
<tr>
<td>(Likert)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Fitness-Attitude</td>
<td>3.9</td>
<td>3.9</td>
<td>3.8</td>
<td>55.43</td>
</tr>
<tr>
<td>(Thurstone)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Attitude</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>48.44</td>
</tr>
<tr>
<td>Body-Attitude</td>
<td>78</td>
<td>80</td>
<td>83</td>
<td>45.87</td>
</tr>
</tbody>
</table>
PLATE I

PHYSICAL FITNESS PRE-TEST DISTRIBUTIONS

a. Pull-ups

b. Sit-ups

c. 12-Minute Run

d. Grip Strength
PLATE II
ATTITUDE PRE-TEST DISTRIBUTIONS

a. Likert Scale

b. Thurstone Scale

c. Self-Attitude

d. Body-Attitude

4 Day 2 Day Control
observed differences were not great. The control group scored higher than either experimental group for four variables and higher than the four day group for another variable. The experimental groups only scored higher on the physical fitness-attitude variable as measured by two different scales. All pre-test medians for body-attitude and physical fitness-attitude (Likert scale) were well beyond the neutral zone, indicating positive attitudes before the conditioning program began.

Physical fitness comparisons

Distributions for the differences between before and after physical fitness tests for the two experimental groups are shown in Plate III. Since normal distributions were not achieved, the non-parametric Kruskal-Wallis one-way analysis of variance was employed. The results are shown in Table 4.

Pre-post test differences for three of the tests were highly significant (beyond .001), and medians representing the observed differences favored the experimental groups. However, some of these differences were not great; for example, one 220 yard lap and one pull-up separated the four day experimental group from the controls. Rank means reflected more widespread differences.

Grip strength testing met with two difficulties. First, calibration problems caused low post-test scores, resulting in negative medians. Second, significance was only achieved beyond .01; therefore, the non-parametric Mann-Whitney U was computed to determine whether both experimental groups were significantly better than the controls. The results are shown in Table 5. The four day group was significantly better, but
PLATE III

PHYSICAL FITNESS PRE-POST TEST DIFFERENCES:
DISTRIBUTIONS FOR THE EXPERIMENTAL GROUPS

a. Pull-ups

b. Sit-ups

c. Grip Strength

d. 12-Minute Run
the two day group only achieved a .18 level of significance.  

TABLE 4
THREE GROUP COMPARISONS OF PRE-TEST - POST-TEST DIFFERENCES FOR EIGHT VARIABLES

<table>
<thead>
<tr>
<th>Variable</th>
<th>Median Rank Means</th>
<th>Rank Means</th>
<th>H</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4 Day</td>
<td>2 Day</td>
<td>Controls</td>
<td>4 Day</td>
</tr>
<tr>
<td>Pull-ups</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>62.24</td>
</tr>
<tr>
<td>Sit-ups</td>
<td>8</td>
<td>6.5</td>
<td>-.5</td>
<td>61.63</td>
</tr>
<tr>
<td>Grip Strength</td>
<td>-1</td>
<td>-3.5</td>
<td>-7</td>
<td>58.72</td>
</tr>
<tr>
<td>12-min. Run</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>62.89</td>
</tr>
<tr>
<td>Physical Fitness-Attitude (Likert)</td>
<td>1</td>
<td>.5</td>
<td>-1</td>
<td>50.09</td>
</tr>
<tr>
<td>Physical Fitness-Attitude (Thurstone)</td>
<td>-.1</td>
<td>-.1</td>
<td>0</td>
<td>39.59</td>
</tr>
<tr>
<td>Self-Attitude</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>53.39</td>
</tr>
<tr>
<td>Body-Attitude</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>58.26</td>
</tr>
</tbody>
</table>

For an argument supporting this kind of reporting, see: James K. Skipper et al.,"The Sacredness of .05; a Note concerning the Uses of Statistical Levels of Significance in Social Science," American Sociologist, II (February, 1967), 16-18.
### TABLE 5

**TWO GROUP COMPARISONS OF PRE-TEST - POST-TEST DIFFERENCES FOR SELECTED VARIABLES**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Groups</th>
<th>z</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grip Strength 4 Day - Controls</td>
<td>2.49</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>Grip Strength 2 Day - Controls</td>
<td>1.34</td>
<td>.18</td>
<td></td>
</tr>
<tr>
<td>Physical Fitness-Attitude (Likert)</td>
<td>.33</td>
<td>.74</td>
<td></td>
</tr>
<tr>
<td>Physical Fitness-Attitude (Likert) 2 Day - Controls</td>
<td>.63</td>
<td>.52</td>
<td></td>
</tr>
<tr>
<td>Physical Fitness-Attitude (Likert) 2 Day - 4 Day</td>
<td>.01</td>
<td>.99</td>
<td></td>
</tr>
<tr>
<td>Self-Attitude 4 Day - Controls</td>
<td>.89</td>
<td>.37</td>
<td></td>
</tr>
<tr>
<td>Self-Attitude 4 Day - 2 Day</td>
<td>.82</td>
<td>.41</td>
<td></td>
</tr>
<tr>
<td>Self-Attitude Controls - 2 Day</td>
<td>.21</td>
<td>.83</td>
<td></td>
</tr>
<tr>
<td>Body-Attitude 4 Day - Controls</td>
<td>1.95</td>
<td>.05</td>
<td></td>
</tr>
<tr>
<td>Body-Attitude 2 Day - Controls</td>
<td>.03</td>
<td>.89</td>
<td></td>
</tr>
</tbody>
</table>

*Group with higher rank mean appears first.*

**Quantitative attitude comparisons**

The Kruskal-Wallis one-way analysis of variance and the Mann-Whitney U test were again employed to compare the ordinal data of the three groups. The results are shown in Tables 4 and 5. Distributions are shown in Plate IV.
PLATE IV

DISTRIBUTIONS OF ATTITUDE PRE-POST TEST DIFFERENCES

a. Self-Attitude

b. Likert Scale

c. Body-Attitude
Pre-post test analysis of variance of physical fitness-attitude as measured by the Thurstone scale was not statistically significant and therefore was not further analyzed. It should be noted that a widespread difference among rank means was evident but that this difference opposed other reported differences, i.e., more subjects from the control group improved more markedly on the Thurstone scale. The large N of the controls (48) in comparison to the experimental groups (27 and 22) accounted for the low H. 4

The Likert scale representing physical fitness-attitude obtained the .02 level of significance for pre-post test comparisons, although comparisons of each of the experimental groups with the control group revealed very little difference. Observed differences among groups as represented by both medians and rank means as well as apparent distribution similarities support this latter conclusion.

Self-attitude pre-post test differences achieved significance beyond .01 among the three groups, but a comparison of the four day group with the controls using the Mann-Whitney U test yielded only a .37 level of significance. Other two group comparisons were even less significant. However, the spread between the four day group pre-post test median and the control group pre-post test median was one unit in a scale which only ranges from zero to six units, and Plate IV shows greater relative improvements for the four day group in comparison to the controls. The rank mean difference between the four day group and the control group was also reasonably large.

4See: Siegel, op. cit., pp. 184-93.
Body-attitude pre-post test differences tended toward significance (p<.20) when the three groups were compared, and the .05 level was obtained in a comparison of the four day group with the controls. However, the spread between the four day group pre-post test median and the control group pre-post test median was only three units in a test that hypothetically ranged from seven to 105 units. Rank mean differences were great. This was the only variable for which the pre-post test median of the control group showed improvement, although it is evident from Plate IV that the control group improved on other variables as well.

Fitness - attitude relationships

The non-parametric Spearman rank correlation coefficient was utilized to compute correlation coefficients for the twenty-seven four day experimental subjects. Each of the four fitness measures and a combined fitness score was correlated with each of the three attitude measures which showed some change. The results are shown in Table 6.

Although none of the correlations reached the .10 level of significance, some trends were apparent. First, three of the five correlations involving the self-attitude were beyond .20, indicating that perhaps individual self-attitude improvement varies to some extent with individual changes in physical fitness. Second, the twelve-minute run and to a lesser extent grip strength correlated beyond .20 with two of the three attitude measures, suggesting the possibility that individual attitude change is linked to individual change in cardiovascular endurance and muscular strength.
**TABLE 6**

FOUR DAY EXPERIMENTAL GROUP PHYSICAL FITNESS-ATTITUDE CORRELATIONS FOR PRE-TEST - POST-TEST DIFFERENCES

<table>
<thead>
<tr>
<th>N</th>
<th>Variables</th>
<th>Rho</th>
</tr>
</thead>
<tbody>
<tr>
<td>27</td>
<td>Physical Fitness$^a$ - Physical Fitness-Attitude (Likert)</td>
<td>-.04</td>
</tr>
<tr>
<td>27</td>
<td>Physical Fitness - Self-Attitude</td>
<td>.25</td>
</tr>
<tr>
<td>27</td>
<td>Physical Fitness - Body-Attitude</td>
<td>.06</td>
</tr>
<tr>
<td>27</td>
<td>Pull-ups - Physical Fitness-Attitude (Likert)</td>
<td>-.20</td>
</tr>
<tr>
<td>27</td>
<td>Pull-ups - Self-Attitude</td>
<td>.07</td>
</tr>
<tr>
<td>27</td>
<td>Pull-ups - Body-Attitude</td>
<td>-.14</td>
</tr>
<tr>
<td>27</td>
<td>Sit-ups - Physical Fitness-Attitude (Likert)</td>
<td>-.23</td>
</tr>
<tr>
<td>27</td>
<td>Sit-ups - Self-Attitude</td>
<td>-.04</td>
</tr>
<tr>
<td>27</td>
<td>Sit-ups - Body-Attitude</td>
<td>.15</td>
</tr>
<tr>
<td>27</td>
<td>Grip Strength - Physical Fitness-Attitude (Likert)</td>
<td>.21</td>
</tr>
<tr>
<td>27</td>
<td>Grip Strength - Self-Attitude</td>
<td>.22</td>
</tr>
<tr>
<td>27</td>
<td>Grip Strength - Body-Attitude</td>
<td>-.01</td>
</tr>
<tr>
<td>27</td>
<td>12-min. Run - Physical Fitness-Attitude (Likert)</td>
<td>.10</td>
</tr>
<tr>
<td>27</td>
<td>12-min. Run - Self-Attitude</td>
<td>.32</td>
</tr>
<tr>
<td>27</td>
<td>12-min. Run - Body-Attitude</td>
<td>.21</td>
</tr>
</tbody>
</table>

$^a$A total physical fitness score for each subject was calculated from analysis of variance ranks using these weights: 12-min. run—33.33%; pull-ups—33.33%; grip strength—16.66%; sit-ups—16.66%. Pull-ups were weighted more heavily, because they represent muscular endurance and to some extent muscular strength.
Fitness knowledge - attitude comparisons

Nineteen controls who were exposed to physical fitness information and who answered at least ten out of twenty multiple choice questions concerning this information correctly were compared to twenty-six controls who did not receive this treatment. The Mann-Whitney U test was applied to pre-post test differences for both the Likert and Thurstone scales. Neither scale approached significance as shown in Table 7.

<table>
<thead>
<tr>
<th>Physical Fitness-Attitude Instrument</th>
<th>Median Difference</th>
<th>z</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thurstone Scale</td>
<td>.1 (N=19)</td>
<td>.85</td>
<td>.40</td>
</tr>
<tr>
<td>Likert Scale</td>
<td>-1 (N=19)</td>
<td>.46</td>
<td>.65</td>
</tr>
</tbody>
</table>

Physical activity history comparisons

Physical activity history questionnaires of all experimental subjects were screened to identify those subjects who were active in both high school varsity and intramural athletics and whose fathers were active both on- and off the job and those subjects who were inactive and whose fathers were inactive. Three subjects from the four day experimental group and three subjects from the two day group scored positively in each of these categories, and four subjects from the four day group and three subjects from the two day group scored negatively in each of these
categories. The Mann-Whitney U for small samples was applied to these extreme groups; the results are shown in Table 8.

Only the body-attitude pre-post test difference approached the .05 level of significance with the low activity group scoring higher, but pre-test comparisons revealed a slight tendency toward significantly lower scores for the low activity group. Thus they were disposed toward improvement. The low activity group also improved more in the twelve-minute run despite insignificant pre-test differences.

Since the attitudes of the two day group did not improve in earlier comparisons with the controls, the inclusion of these subjects may have obscured real differences between low and high physical activity history subjects. Therefore, four day subjects were compared as shown in Table 8. The high activity group tended toward greater improvement on the Likert scale despite higher pre-test scores for the combined group. Body-attitude pre-post test difference again tended toward significance in favor of the low activity group.

Socio-economic index relationships

The twenty-seven four day experimental subjects were classified according to their father's occupation using the socio-economic index for occupations in the detailed classification of the Bureau of the Census, 1950. These scores were correlated with pre-post test

\[ A. J. Reiss, \textit{Occupations and Social Status} \text{(New York: Free Press of Glencoe, 1961)}, \text{cited by Oppenheim, op. cit.}, \text{pp. 264-75.} \]
<table>
<thead>
<tr>
<th>Variable</th>
<th>Low PAH N</th>
<th>High PAH N</th>
<th>U</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Test Pull-ups</td>
<td>7</td>
<td>6</td>
<td>18</td>
<td>.73</td>
</tr>
<tr>
<td>Pre-Test Sit-ups</td>
<td>7</td>
<td>6</td>
<td>17</td>
<td>.63</td>
</tr>
<tr>
<td>Pre-Test Grip Strength</td>
<td>7</td>
<td>6</td>
<td>17</td>
<td>.63</td>
</tr>
<tr>
<td>Pre-Test 12-min. Run</td>
<td>7</td>
<td>6</td>
<td>15</td>
<td>.45</td>
</tr>
<tr>
<td>Pre-Test Physical Fitness-Attitude (Likert)</td>
<td>7</td>
<td>6</td>
<td>12</td>
<td>.23&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Pre-Test Self-Attitude</td>
<td>7</td>
<td>6</td>
<td>16</td>
<td>.53</td>
</tr>
<tr>
<td>Pre-Test Body-Attitude</td>
<td>7</td>
<td>6</td>
<td>14</td>
<td>.37&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Pull-ups Difference</td>
<td>7</td>
<td>6</td>
<td>17</td>
<td>.63</td>
</tr>
<tr>
<td>Sit-ups Difference</td>
<td>7</td>
<td>6</td>
<td>14</td>
<td>.37</td>
</tr>
<tr>
<td>Grip Strength Difference</td>
<td>7</td>
<td>6</td>
<td>16</td>
<td>.53</td>
</tr>
<tr>
<td>12-min. Run Difference</td>
<td>7</td>
<td>6</td>
<td>10</td>
<td>.14&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Physical Fitness-Attitude (Likert) Difference</td>
<td>7</td>
<td>6</td>
<td>19</td>
<td>.82</td>
</tr>
<tr>
<td>Self-Attitude Difference</td>
<td>7</td>
<td>6</td>
<td>18</td>
<td>.73</td>
</tr>
<tr>
<td>Body-Attitude Difference</td>
<td>7</td>
<td>6</td>
<td>8</td>
<td>.07&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Physical Fitness-Attitude (Likert) Difference&lt;sup&gt;c&lt;/sup&gt;</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>.20&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Self-Attitude Difference&lt;sup&gt;c&lt;/sup&gt;</td>
<td>4</td>
<td>2&lt;sup&gt;d&lt;/sup&gt;</td>
<td>3</td>
<td>.40</td>
</tr>
<tr>
<td>Body-Attitude Difference&lt;sup&gt;c&lt;/sup&gt;</td>
<td>4</td>
<td>2&lt;sup&gt;d&lt;/sup&gt;</td>
<td>2</td>
<td>.27&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup>High physical activity history group scored better.

<sup>b</sup>Low physical activity history group scored better.

<sup>c</sup>Four day experimental subjects only.

<sup>d</sup>Subjects whose pre-test attitudes could not improve were excluded.
differences of the eight quantitative variables using the Spearman rank correlation coefficient. The results are shown in Table 9. Also, the upper and lower ends of the range of socio-economic scores were compared using the Mann-Whitney U for small samples; the results are shown in Table 10.

**TABLE 9**

FOUR DAY EXPERIMENTAL GROUP SOCIO-ECONOMIC INDEX - PHYSICAL FITNESS AND SOCIO-ECONOMIC INDEX - ATTITUDE CORRELATIONS

<table>
<thead>
<tr>
<th>N</th>
<th>Variable Correlated With Socio-Economic Index</th>
<th>RHO</th>
</tr>
</thead>
<tbody>
<tr>
<td>27</td>
<td>Physical Fitness Difference</td>
<td>-.10</td>
</tr>
<tr>
<td>27</td>
<td>Pull-ups Difference</td>
<td>-.01</td>
</tr>
<tr>
<td>27</td>
<td>Sit-ups Difference</td>
<td>.17</td>
</tr>
<tr>
<td>27</td>
<td>Grip Strength Difference</td>
<td>-.29</td>
</tr>
<tr>
<td>27</td>
<td>12-min. Run Difference</td>
<td>.03</td>
</tr>
<tr>
<td>27</td>
<td>Physical Fitness-Attitude (Likert) Difference</td>
<td>.25</td>
</tr>
<tr>
<td>24(b)</td>
<td>Self-Attitude Difference</td>
<td>.13</td>
</tr>
<tr>
<td>26(b)</td>
<td>Body-Attitude Difference</td>
<td>-.11</td>
</tr>
</tbody>
</table>

\(a\)Low socio-economic indexes correlated with low fitness and attitude scores.

\(b\)Subjects whose pre-test attitudes could not improve were excluded.
TABLE 10

COMPARISONS OF SELECTED PRE-TEST - POST-TEST DIFFERENCES
FOR FOUR DAY EXPERIMENTAL SUBJECTS WITH
HIGH AND LOW SOCIO-ECONOMIC INDICES

<table>
<thead>
<tr>
<th>Variable</th>
<th>Low SEI N</th>
<th>High SEI N</th>
<th>U</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Fitness-Attitude (Likert) Difference</td>
<td>5</td>
<td>6</td>
<td>10</td>
<td>.43</td>
</tr>
<tr>
<td>Self-Attitude Difference</td>
<td>4</td>
<td>6</td>
<td>9</td>
<td>.61</td>
</tr>
<tr>
<td>Body-Attitude Difference</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>.47</td>
</tr>
</tbody>
</table>

aLow socio-economic indices ranged from seven to twenty-one, high socio-economic indices ranged from eighty-two to eighty-seven.

bSubjects whose pre-test attitudes could not improve were excluded.

The resulting correlation coefficients and levels of significance did not reveal any strong connections between socio-economic status and changes in either physical fitness or attitudes. Only grip strength favoring lower socio-economic status and the Likert scale favoring upper socio-economic status tended toward significance, but the correlations were weak.

Qualitative self-attitude changes

Answers to the open-ended questions "What I like about myself" and "What I dislike and how I hope to change" were subjectively evaluated by the writer. Each subject's pre-test and post-test responses were compared and classified as either a positive change, a negative change,
or no change. An attempt was made to conservatively evaluate each response so that questionable changes were classified as no change. The results are shown in Table 11, and a complete, unedited record of all responses by classification is included in Appendix IV.

Negative changes were approximately evenly spread across the three groups. The eight positive changes in the four day experimental group affected almost thirty per cent of that group, while positive changes in the other two groups affected only about eight per cent of each group.

<table>
<thead>
<tr>
<th>TABLE 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>OBVIOUS CHANGES IN QUALITATIVE SELF-ATTITUDE</td>
</tr>
<tr>
<td>BY SUBJECTIVE EVALUATION</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>Group</td>
</tr>
<tr>
<td>---------</td>
</tr>
<tr>
<td>4 Day Experimental</td>
</tr>
<tr>
<td>2 Day Experimental</td>
</tr>
<tr>
<td>Controls</td>
</tr>
</tbody>
</table>

A content analysis of the kinds of changes found in the responses is shown in Table 12. Both experimental groups experienced more kinds of changes than the controls who, for the most part, added a positive statement on the post-test response which was not related to their pre-test response. Over half of the four day group's changes were accounted for by stated improvements in physical fitness, which in almost all cases was accompanied by other stated improvements, and by statements which changed from fair or good to obviously more positive self-evaluations.
TABLE 12

CONTENT ANALYSIS OF QUALITATIVE SELF-ATTITUDE RESPONSES

<table>
<thead>
<tr>
<th>Kind of Change</th>
<th>4 Day Group</th>
<th>2 Day Group</th>
<th>Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Added a post-test positive statement</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Pre-test negative statement omitted on post-test</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Pre-test potential to post-test realized potential</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Pre-test fair or good self-evaluation to post-test more positive self-evaluation</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Improved physical fitness</td>
<td>4/(12(N=8))</td>
<td>2/(5(N=2))</td>
<td>0/(4(N=4))</td>
</tr>
</tbody>
</table>

Discussion

It is the purpose of this discussion to interpret the findings presented above. Chapter V delineates specific limitations, conclusions, and recommendations.

The experimental groups and especially the four day group were disposed toward improvement by scoring lower on pre-test pull-ups, twelve-minute run, self-attitude, and body-attitude, and to a lesser extent sit-ups. The controls were disposed toward improvement for physical fitness-attitude. Changes in body-attitude and physical fitness-attitude (Likert scale) were made more difficult by initially high medians for all groups. Although the observed differences for all variables were not great, attention must be paid to these differences in any
analysis of pre-post test differences.

Significant improvements in the physical fitness tests for the experimental groups were achieved, although observed pre-post test median differences were not exceedingly large. The differences between the two experimental groups were not large, although the four day group scored somewhat higher according to most median and rank mean comparisons. Pre-post test rank mean differences were much greater than rank mean differences for the pre-test data.

Pre-post test differences for the attitude measures lack such clarity. However, it is clear that the two physical fitness-attitude scales do not measure the same attitude. It is also reasonably clear that the Mann-Whitney U test is a more difficult test for obtaining significance than the Kruskal-Wallis one-way analysis of variance, although both have a power-efficiency exceeding ninety-five per cent in comparison to their parametric equivalents. Only body-attitude achieved greater significance with the Mann-Whitney U test.

When pre-post test rank mean differences, median differences, and levels of significance were compared to pre-test rank mean differences, median differences, and levels of significance, it was apparent that the four day group's improvement in self-attitude provided the key finding for this study. The pre-post test median spread between the four day group and controls was one unit in a scale ranging from zero to six units, while the pre-test median spread was zero. The pre-post test rank mean spread was about five units compared to about one unit for

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6See: Siegel, op. cit., pp. 126, 192-93.
the pre-test rank mean spread. Further, the possibility that this was a chance occurrence fell beyond .01 when the three groups were compared and at .37 when the four day group was compared to the controls. Plate IV shows that the four day group had more subjects per group who did not change, more subjects per group who improved two units, and fewer subjects per group who decreased one unit in comparison to the controls. Finally, subjective evaluation of the qualitative self-attitude data supports the conclusion that the self-attitude of the four day group improved substantially.

There may have been a tendency for body-attitude and physical fitness-attitude (Likert scale) to improve for the four day group. Physical fitness-attitude pre-tested significantly higher for the four day group, and both attitudes were initially positive for all groups. In addition, Plate IV shows a greater shift toward body-attitude improvement for the four day group. However, observed pre-post test median differences for both variables and rank mean differences for the Likert scale were not large.

Focusing on the control group pre-post test scores, Plate IV shows that this group also improved in self-attitude, body-attitude, and physical fitness attitude. The pre-post test median for body-attitude also indicated improvement.

Data for the relationship between physical fitness improvement and attitude improvement suggest that attitude change is a function of the conditioning experience rather than specific improvements in muscular strength, muscular endurance, and cardiovascular endurance—i.e., individual attitude changes did not vary directly with physical fitness
changes, although the four day group did improve both physical fitness scores and certain attitude scores. Physical fitness pre-post test similarities between the two experimental groups tend to support this conclusion, at least to some extent. However, self-attitude changes, which were the most evident attitude changes in the four day group, appeared to be partially related to changes in cardiovascular endurance, grip strength, and overall physical fitness, although the correlations were not strong. Also, both the twelve-minute run and grip strength may be causally related to attitude change, but again the correlations were weak.

Physical fitness information did not change physical fitness-attitude in this study, although the procedure for presenting this information and evaluating cognitive learning is open to question.

Using small samples, the only interesting finding in comparing widely different physical activity histories was that body-attitude may be more susceptible to change for subjects with low physical activity histories, although these subjects were somewhat more disposed toward change by lower initial scores.

It did not appear from the data that socio-economic status relates to either fitness or attitude change, although a more comprehensive socio-economic classification system may yield different findings. Low correlations were reported for grip strength and low socio-economic status and for physical fitness-attitude (Likert scale) and high socio-economic status.
V. SUMMARY, CONCLUSIONS, LIMITATIONS

Summary

Three groups of male college students consisting of twenty-seven subjects in a four day/week experimental group, twenty-two subjects in a two day/week experimental group, and forty-eight subjects in a control group were pre- and post-tested for muscular strength, muscular endurance, and cardiovascular endurance and for affective attitudes toward the self, the body, and physical fitness. Between testing sessions, an eight week physical conditioning program was experienced by the two experimental groups, while the controls played volleyball twice weekly. During the eight weeks, twenty-two controls were exposed to physical fitness information and tested for retention of this information. Physical activity history data and father's occupation were gathered during the pre-test session.

The experimental group and especially the four day group scored significantly lower on four of the variables during pre-testing, which disposed these subjects toward greater improvements for these variables, and higher on two of the variables. However, observed median and rank mean differences were not great. All groups had high pre-test scores for body-attitude and physical fitness-attitude.

Both experimental groups showed considerable improvement in comparison to the control group on three of the four physical fitness measures—i.e., twelve-minute run, pull-ups, and sit-ups—and reasonable improvement in comparison to the controls on grip strength. However, only the four day experimental group tended toward attitude improvement.
A definite change was observed in the self-attitude and some changes, although not great, in body-attitude and physical fitness-attitude (Likert scale). Physical fitness-attitude as measured by the Thurstone scale did not change significantly for any group.

Correlations between specific physical fitness improvements and specific attitude improvements were weak for the most part, except that low positive correlations were observed for the self-attitude in relation to overall physical fitness and two other fitness measures and for grip strength and the twelve minute run in relation to some attitude changes.

Those nineteen controls who were exposed to physical fitness information and who answered correctly at least half of the questions concerning this information were compared to twenty-six controls who did not receive this treatment. Physical fitness-attitude was not altered by exposure to this information.

Physical activity history did not appear to influence fitness or attitude change except that subjects with inactive histories experienced greater changes in body-attitude. For the most part, socioeconomic status was not related to fitness or attitude changes.

Limitations

The following limitations reduce the applicability of the findings of this study. In some instances, arguments supporting the research design are included. In all cases, these limitations were considered in determining the conclusions and recommendations.
1. The sample was not selected at random which limits generalization of the findings to subjects who participated in this experiment. However, Gold argued that even a strict random sampling cannot be generalized to a larger population without "repeated observation under varying conditions of population," because any sample represents a specific time and place which may influence responses.¹

2. Following Gold's argument, replication of important findings is essential before definitive conclusions can be reached. Obviously, this has not been accomplished, unless the review of literature is construed to support this study's findings.

3. The instrumentation is open to question, especially concerning attitude measurement. One criterion for selection of instruments was brevity, thus reducing the field from which to choose. However, the discussion of attitude measurement in Chapter III elucidated the differences of opinion concerning instrument selection; there are no definitive statements on the subject.

4. The experiment was short-term in nature, extending for only eight weeks. Although this is specified in the purposes of the study listed in Chapter I, it is a serious limitation in two ways. First, longer exposure to the experimental stimulus may be desirable, although McPherson found that twenty-four weeks was too long for his "normal" subjects.² Second, re-testing of the four day experimental group at a

²McPherson, loc. cit., p. 102.
a later date is essential to determine to what extent the new attitudes were maintained.

5. Each variable was considered in isolation. In Chapter I, consistency of attitudes and attitude clusters versus attitude compartmentalization and differentiation was discussed. The latter argument supports the research design of this study. The former argument could be used as a basis for designing a multidimensional analysis of variance model.

6. The pre-test differences have been discussed. Although the observed differences were not great, these pre-test differences were taken into consideration in the analysis of the data. It would be difficult if not impossible to meaningfully match subjects on the basis of pre-test scores for eight variables.

7. High pre-test medians for body-attitude and physical fitness-attitude for all groups made improvement of these variables difficult.

8. The procedure for exposing the controls to physical fitness knowledge and for evaluating their cognitive learning as a result of this information was admittedly weak. The class situation prevented a more extensive approach.

9. The use of occupation to represent socio-economic status is common, but a more comprehensive classification may have yielded different results.

10. Attitudes of the control group improved somewhat, perhaps reflecting the operation of a Hawthorne effect for these variables.

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Conclusions which support the hypotheses

1. The self-attitude of the male college students in the four day/week conditioning program improved in comparison to the two day group and the controls.

2. Physical fitness-attitude as measured by the Likert scale and body-attitude of the male college students in the four day/week conditioning program moderately improved in comparison to the two day group and the controls.

3. Certain aspects of the attitude theory reviewed in Chapter I take on meaning in retrospect. For affective attitude change to occur, a need must be present so that need reduction can occur. A path to need satisfaction must also be present, and the removal of threats must be guaranteed. In addition, all attitudes are subject to a wide range of influences. Although the United States is often referred to as the "cult of the average," the key to explaining attitude change resides in the individual who experiences the conditioning program. For change to occur he must feel a need, and this need must be able to be realized through the conditioning program. The removal of threats associated with such a program is dependent upon many factors including the instructor, the peer group, and the daily lesson plan requirements. Finally, an almost infinite number of factors from the societal level to the personality can affect the attitude under consideration. As a result of this process, attitude change, unlike fitness development, is imperfectly accomplished. Individuals react in different ways to the conditioning program.
Therefore, any comparison of central tendencies may obscure individual changes which are, after all, central to the developmental objectives of physical education.

Conclusions which oppose the hypotheses

1. Two day/week conditioning programs can improve physical fitness, but affective attitudes are not changed, at least within the limitations of this study.

2. The two scales which purported to measure physical fitness-attitude do not measure the same attitude.

3. The results of this study raise the question of the connection between self- and body-attitude. If the instrumentation is adequate, it appears that body conditioning has more effect on the self-attitude than on the more obvious body-attitude. It may be that subjective psycho-physical experiences form the basis for the body-attitude as well as the body image as suggested in Chapter I.

Other conclusions

1. This study provides some evidence that specific attitude changes are a function of the conditioning experience and general conditioning development rather than specific gains in muscular strength, muscular endurance, and cardiovascular endurance. The experimental group which experienced attitude changes also experienced significant changes in physical fitness, but individual attitude changes did not vary directly with individual fitness changes. Correlations which oppose this conclusions were not strong. Physical fitness pre-post test
similarities tend to support this conclusion.

2. An inactive physical activity history prior to the physical conditioning experience may be the key to body-attitude improvement.

3. It was not demonstrated that attitude change is a function of socio-economic status within the limitations of this sample of male college students.

4. Body-attitude and physical fitness-attitude as measured in this study appear to be initially positive for male college students.

Recommendations

1. This study was intended to be exploratory in nature. Replication is necessary. To determine exactly what to replicate, it is necessary to review the findings once more. Self-attitude change is most promising, especially if the length of the conditioning program were extended, perhaps to ten weeks, and the subjects were retested five to ten weeks after the program terminated. It may also be worthwhile to replicate the body-attitude and physical fitness-attitude (Likert scale) aspects of the study, because the data suggest possible changes. Before attempting replication, these two instruments should be subjected to additional pilot studies.

2. Although replication is necessary, it is recommended that a four day/week conditioning program be offered at both the high school level, for at least a semester, and at the college level. At the college level it may be appropriate to require that a certain percentage of the enrolling students have inactive physical activity histories
and reasonably low physical fitness scores. However, the inability to screen students in this manner should not preclude offering such a course; its worth in improving not only physical fitness but perhaps the affective attitudes of at least some of the enrolled students is sufficient justification. Meanwhile, replication should provide evidence upon which to plan future programs.
APPENDIX I

ATTITUDE INSTRUMENTS

The following questionnaire consists of six separate and somewhat different parts. Separate instructions precede each part. In the first five parts, your honest opinion in relation to the statements or questions is desired. There are no right or wrong answers. Please work rapidly and be certain to respond to every statement. The sixth part requests factual information.

The information gathered from this questionnaire will be used exclusively for research purposes, and at no time will your responses be identified by your name.

PART I: Please read each of the following fourteen statements carefully and circle the response which best expresses your immediate reaction to the statement. The responses are: strongly agree (SA), agree (A), uncertain or neutral (U), disagree (D), strongly disagree (SD).

1. People should spend at least twenty minutes a day participating in vigorous exercise.
2. I prefer physical activity which places primary emphasis on such conditioning goals as strength and endurance.
3. Automation has made physical fitness unnecessary in today's society.
4. It is important to be physically fit in case an emergency arises.
5. The need for much higher levels of physical fitness in our society is obvious.
6. Golf and bowling should not be classified as conditioning exercises.
7. If my choice of occupation would interfere with exercising regularly I would find a new job.
8. I get all the conditioning I need from an occasional weekend bout of exercise.  
9. Vigorous exercise in not necessary to maintain one's general health.  
10. If I had to choose between an inactive pursuit and exercising I would definitely choose the inactive pursuit.  
11. Part of our daily lives must be committed to vigorous exercise.  
12. Physical fitness should not be a major goal in high school and college physical education classes.  
13. The inactive nature of American society requires regular participation in some form of vigorous exercise.  
14. It's hard to find time to exercise regularly.

PART II: Please read each of the following ten statements carefully and circle the response which best expresses your immediate reaction to the statement. The responses are: strongly agree (SA), agree (A), disagree (D), strongly disagree (SD).

1. On the whole, I am satisfied with myself.  
2. At times I think I am no good at all.  
3. I feel that I have a number of good qualities.  
4. I am able to do things as well as most other people.  
5. I feel I do not have much to be proud of.  
6. I certainly feel useless at times.  
7. I feel that I am a person of worth, at least on an equal plane with others.  
8. I wish I could have more respect for myself.  
9. All in all, I am inclined to feel that I am a failure.  
10. I take a positive attitude toward myself.
PART III: Please read each of the following nineteen statements carefully and circle the number opposite each statement with which you agree. Make no marks on the numbers opposite the statements with which you disagree; your disagreement is indicated by not circling those numbers.

1. Physical fitness activities are vital to life.
2. Physical fitness programs are not sufficiently appreciated by college students.
3. Physical fitness activity should be left to the individual.
4. Planned physical activity programs have limited appeal.
5. Physical fitness activities appeal to man's highest nature.
6. Physical fitness activity is the lowest type of activity indulged in by man.
7. Physical fitness activity programs are necessary only in wartime.
8. Physical fitness programs are too soft.
9. Physical activity should not be stressed so much in our present culture.
10. Physical fitness activity is unnecessary.
11. Physical fitness activities have not proved indispensable to society.
12. Physical fitness activity programs should be stressed.
13. Man has outgrown the need for physical fitness programs.
14. Physical fitness activities are the least civilized of man's activities.
15. Physical fitness activities are retained in the world because of their value to mankind.
16. Physical fitness activity is a "must" in today's world.
17. The values of physical activity are debatable.
18. Physical activity benefits everybody.
19. Physical fitness is a most important aspect of life.
PART IV: In the following inventory you are requested to judge the statement "my body as it really is" in relation to fifteen sets of descriptive adjectives. Please make your judgments on the basis of what this concept means to you. There are seven spaces between each set of adjectives; make your check-mark on the space which best represents your position in relation to the two descriptive words. For example, a check-mark on the space nearest to one of the two adjectives would indicate that this adjective is highly descriptive of the concept, "my body as it really is." A check-mark two or three spaces away would indicate that this adjective is less descriptive of the concept but still more descriptive than the other adjective. If you cannot decide between the two adjectives or if the adjectives make no sense to you, check space 4.

MY BODY AS IT REALLY IS

<table>
<thead>
<tr>
<th></th>
<th>Worthwhile</th>
<th>Delicate</th>
<th>Inept</th>
<th>Healthy</th>
<th>Relaxed</th>
<th>Bad</th>
<th>Hard</th>
<th>Useful</th>
<th>Awkward</th>
<th>Unable</th>
<th>Ugly</th>
<th>Adequate</th>
<th>Sturdy</th>
<th>Feminine</th>
<th>Complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Worthless
Rugged
Capable
Sickly
Tense
Good
Soft
Useless
Agile
Competent
Handsome
Inadequate
Feeble
Masculine
Deficient
PART V: You will be given five minutes to write on the following topics:

1. What I like most about myself.

2. What I most dislike, and how I hope to change.
PART VI: The following questions request factual information. Please respond by filling in the blank or by checking the appropriate space.

Your age (in years): ___ Approximate height (in feet and inches): ____________

Approximate weight (pounds): Father's (or guardian's) occupation: ____________

Amount of physical activity of father during working hours: Much ___ Some ___ A Little ___ Almost None ___

Does your father participate in any kind of sport or exercise (including walking) outside of his work? Yes ___ No ___

If you answered yes to the above question, please list the sports and/or exercises below and the approximate number of hours per week that your father spends on each activity:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Did you participate in varsity athletics during high school? Yes ___ No ___

If you answered yes, please list the sports and the number of years of varsity participation for each:

<table>
<thead>
<tr>
<th>Sport</th>
<th>Years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Did you participate in intramural sports during high school? Yes ___ No ___

If you answered yes, how many different sports did you participate in? 1 ___ 2 ___ 3 ___ 4 ___

If you answered yes, what is the average number of years you participated in each sport? 1 ___ 2 ___ 3 ___ 4 ___

Please evaluate your present state of health:
Excellent ___ Good ___ Fair ___ Poor ___
APPENDIX II

LESSON PLANS FOR THE CONDITIONING PROGRAM

I. The four day/week experimental group

January 9 and 13, 1969: Pre-tests

January 10: Weight lifting to determine maximum loads

January 14: Introduction to circuit training
   The circuit: 1. Pull-ups (2/3 maximum effort)
   2. Bent-knee sit-ups (2/3 maximum effort)
   3. Barbell curls (2/3 maximum effort, 8 repetitions)
   4. Dips or push-ups (2/3 maximum effort)
   5. 40 yard sprints (5-10 repetitions)
   6. Military presses (2/3 maximum effort, 8 repetitions)
   7. Double lateral leg raisers (15-25 repetitions on each side)
   8. Peg-board or rope or ladder with flexed elbow (one trip)
   9. Jump squats with dumbbells (20-30 repetitions)

January 16: 220 yard jog; 3 x 440 yards with 105 second work intervals and 150 second rests; 440 yard jog

January 17: 2 x circuit

January 20: 440 yard jog; 4 x 440 yards with 105 second work intervals and 150 second rests

January 21: 2 x circuit

January 22: 440 yard jog; 7 x 220 yards with 45 second work intervals and 75 second rests

January 23: Heavy resistance weight training
   2 x 4-6 maximum repetitions of any two:
   Barbell curl
   Bench press
   Upright rowing
   Bent-arm pullover
2 x 4-6 maximum repetitions of any two:
- Dumbbell arms sideward lift
- Dumbbell arms forward lift
- Dumbbell arms backward lift
- Dumbbell supine horizontal arms lift
- Dumbbell shoulder rotation

2 x 6 maximum repetitions of any two:
- Leg press (machine)
- Half squat
- Toe raise
- Queen Ann's chair (isometric exercise)

January 27: 440 yard jog; 4 x 440 yards with 100 second work intervals and 135 second rests; 220 yard jog

January 28: 2 x circuit

January 30: 440 yard jog; 5 x 440 yards with 100 second work intervals and 120 second rests

January 31: Heavy resistance weight training (see January 23)

February 3: 7 minute jog; 3 x 220 yards with 45 second work intervals and 75 second walk-jog intervals (220 yards to cover during rest)

February 4: 3 x circuit (reduce maximum efforts to 1/2-2/3)

February 6: 440 yard jog; 6 x 440 yards with 100 second work intervals and 110 second rests

February 7: Heavy resistance weight training (add two sets of one additional barbell exercise to January 23 workout)

February 10: 440 yard jog; 6 x 440 with 100 second work intervals and 100 second rests

February 11: 3 x circuit

February 13: 440 yard jog; 8 x 220 yards with 45 second work intervals and 85 second walk-jog intervals (220 yards to cover during rest)

February 14: Heavy resistance weight training (see February 7)

February 17: 440 yard jog; 5 x 440 yards with 95 second work intervals and 95 second rests; 440 yard jog

February 18: 3 x circuit
February 20: 5 x 660 yards with 155 second work intervals and 155 second rests

February 21: Heavy resistance weight training (add one set to each selected exercise from February 7 workout)

February 24: 4 x 880 yards with 210 second work intervals and 210 second rests

February 25: 3 x circuit

February 27: 4 x 880 yards with 210 second work intervals and 210 second rests

February 28: Heavy resistance weight training (see February 21)

March 3: 880-mile jog

March 4, 6, 7: Post-tests

II. The two day/week experimental group

January 9 and 13: Pre-testing

January 15: Introduction to circuit training
Modification of four day group's circuit (see January 14)
3. Barbell curls (maximum effort, 4-6 repetitions)
6. Bench presses or upright rowing (maximum effort, 4-6 repetitions)
8. One dumbbell exercise selected from four day group's January 23 list (maximum effort, 4-6 repetitions)

January 20: 220 yard jog; 3 x 440 yards with 105 second work intervals and 150 second rests; 440 yard jog

January 22: 2 x circuit (modified)

January 27: 440 yard jog; 7 x 220 yards with 45 second work intervals and 75 second rests

January 29: 2 x circuit

February 3: 440 yard jog; 4 x 440 yards with 100 second work intervals and 120 second rests

February 5: 2 x circuit (modified)
February 10: 440 yard jog; 5 x 440 with 100 second work intervals and
100 second rests

February 12: 3 x circuit (modified)

February 17: 440 yard jog; 7 x 220 yards with 45 second work interval
and 85 second walk-jog interval (220 yards to cover during rest)

February 19: 3 x circuit (modified)

February 24: 9 x 220 yards with 45 second work intervals and 50 second
interval of light isotonic exercises

February 26: 2 x circuit (modified)

March 3 and 5: Post-testing
APPENDIX III

PHYSICAL CONDITIONING READING ASSIGNMENT AND TEST

The Benefits of Conditioning.— Considerable research and debate surround this topic, and, as a result, we must be careful in stating the case for conditioning. Two warnings are in order: first, conditioning is not a panacea for all social, mental, and physical ills; and second, benefits are specific to the types of exercises being performed. In this course, we are most concerned with three goals: flexibility, muscular strength, and cardiovascular endurance. Therefore, benefits are stated in relation to these three goals.

Flexibility exercises, in addition to ensuring against damaged muscle fibers during activity, seem to reduce the "aches and pains of old age," because connective tissues which are not continually stretched tend to lose their elasticity with age. Studies have shown that lower back pain is largely the result of muscular stiffness and weakness, so that both flexibility and strength exercises are helpful. Strength exercises may improve resting muscle tonus, although experimental evidence has yet to support this contention. The capacity to meet emergencies (e.g., natural disaster, entrapment, exposure, injury, pursuit) is enhanced by flexibility, strength, and endurance.

Exercises which stress cardiovascular endurance provide a number of benefits. First of all, they are directly related to caloric expenditure and therefore to weight control. Actually, any work, such as flexibility and strength exercises, increases the metabolic processes from the basal rate and therefore aids in weight control. However, endurance exercises cause a greater expenditure and an increased metabolic rate following exercise. Second, these exercises improve the efficiency of the cardiovascular system, so that, for example, the heart becomes more efficient (e.g., heart rate decreases, saving a conditioned person up to 30,000 beats every day), circulation is improved, and total blood volume is increased. Third, cardiovascular endurance has been identified as a likely factor in the prevention of heart disease, although the exact nature of this relationship is still under investigation. Fourth, these exercises may inhibit the aging process. For example, oxygen intake capacity is one indicator of physical deterioration with age; thus, an increase in this capacity through cardiovascular conditioning alleviates at least one kind of age deterioration according to Cureton. Also, using the concept of self-repair in human metabolism, Mateef has argued that longevity (or life span) can be increased by exercises of high intensity. Fifth, vigorous exercise contributes to the ability to relax (reduction of neuromuscular tension). Sixth, there
is the possibility, studied by Russian scientists but yet to be confirmed, that the development of resistance to physical stress such as occurs in cardiovascular conditioning will also develop resistance to other stressors such as hypoxia, overheating, and chilling.

**Flexibility Exercises**.-- In addition to the definition of flexibility as range of motion about a joint, it is important to understand that flexibility can also mean the ease with which a joint is able to function—the degree of stiffness of the joint. A joint can have wide range of motion without being able to move easily through that range. However, methods to reduce the degree of stiffness have not yet been devised. Therefore, we must limit our conditioning efforts to range of motion which is affected by the joint capsule, associated muscles and their fascial sheaths, tendons (muscle to bone attachments), and ligaments (bone to bone attachments). The part these factors play depends upon the joints being exercised.

Two methods can be used to improve range of motion. (Perhaps joint stiffness will also be improved by these methods, but this has not been substantiated.) One method, ballistic stretching, involves dynamic movements (e.g., bobbing, bouncing) whereby one muscle group is stretched as it arrests the movement of an opposing muscle group. The other method, static stretching, involves holding a stretched position for a period of time whereby muscles and connective tissues are stretched to their greatest possible length. Both methods result in significant gains in range of motion. However, static stretching possesses these advantages: (1) The danger of injury by exceeding extensibility limits is reduced; (2) It relieves muscle soreness whereas ballistic stretching can cause muscle soreness; (3) It requires less energy (caloric expenditure) and therefore can be executed while in a business suit in an office if so desired.

**Strength exercises**.-- The concept of strength is still a debated issue. Of particular concern are two questions: How does strength improve? What are the different kinds of strength? The physiologic basis for strength gains—the why—has not been clarified, and recently there has been some thought that the nervous system rather than the muscle itself may hold the key. Concerning types of strength, at least three different types have been identified, although the traditional approach classified one of these three types as power which is discussed below. The remaining two types are: static strength—the exertion of a maximum force for a short period of time; and dynamic strength—the exertion of a sustained contraction or repeated contractions over a longer period of time. This distinction is important, because the selection of a conditioning method depends on which of these types of strength is desired.
Concerning weight training, overload is of central importance, but load and repetitions are dependent upon the desired type of strength. For static strength, a weight should be selected which can only be lifted four or five times. When ten repetitions can finally be achieved, the load should be increased. For dynamic strength (with some improvement in static strength), start with a load that can be lifted eight to ten times and progress to fifteen repetitions. Fewer than four repetitions may not bring all the muscle fibers into play. For either static or dynamic strength gains, one to three sets of a variety of exercises are recommended. Three workouts a week appear to be nearly as effective as five in producing strength gains. To maintain a particular level of strength, weekly and daily workouts can be significantly reduced, perhaps down to a single contraction for each muscle group exerted once a week.

The isometric method appears to develop static strength but not dynamic strength as effectively as weight training. However, there is disagreement in this regard, and one study has reported significant gains in both kinds of strength, power, agility, and perhaps speed as the result of isometric exercises. The major points to remember in executing isometric exercises are: (1) Hold the contraction for ten seconds; (2) Attempt to exert maximal force; (3) Do not hold your breath; (4) Perform the same exercise at several different angles so that the entire range of motion is worked. An exception to these guidelines is Queen Ann's Chair which is held for 30-60 seconds in a sitting position against the wall without a chair (for leg extensors). Breath-holding is not advised because of the possibility of the Valsalva effect.

Exercises for cardiovascular endurance.— In order to enjoy the benefits of cardiovascular endurance exercises, it is probably necessary to undertake aerobic work. This means that oxygen must be taken in and transported to the working tissues. Otherwise, work cannot continue without building up an oxygen debt which must eventually be replenished at a resting state. The 100 yard dash, for example, does not involve aerobic work, because the runner holds his breath until the race is completed and then replenishes his oxygen debt. Since existing evidence indicates that a heart rate in excess of 150 beats per minute must be maintained (probably for at least five minutes) in order to achieve significant improvements in the cardiovascular system, aerobic work is stressed in cardiovascular endurance exercises.

One method of improving cardiovascular endurance is interval training. Interval training is a relatively new concept which is now used extensively in track and swimming and to some extent in other sports such as football and soccer. It can be used to develop oxygen debt capacity and nervous system adaptation as well as aerobic work (oxygen intake) capacity. Interval training is based on the following principles: overload (the living body attempts to compensate when stressed so that future stresses will produce less strain), intensity,
and adaptation during rest. Primarily, interval training involves successive periods of work and rest, with six variables being controlled: (1) Length of time of work interval, (2) Work rate during work interval, (3) Length of time of rest interval, (4) Work rate during rest interval, (5) Number of repetitions of work intervals, (6) Number of days in the week that interval training is practiced. An example of a reasonable program (depending on the individual's initial cardiovascular condition) would be six to eight repetitions of 220 yards each in 40-50 seconds with one minute rests of walking and one day's rest between workouts.

Another method is spot running. The advantages of running in place include minimal space and minimal time. An adequate program can probably be carried out in five minutes a day three times a week in your basement or room. All of the variables of interval training can be adapted to a spot running program. The key is to check your pulse rate for ten seconds during the rest interval to ensure that it is above 150 bests/minute (25 beats for 10 seconds). If it is not, you must adjust one or more of the variables (e.g., a longer work interval or more steps per work interval or lift knees higher). By counting the steps of one foot during the work interval, work rate can be controlled.

Bench stepping also requires little time and space. A chair or steps can be used (15-20 inches high). The interval training principle is again applicable. The Harvard Step Test is one variation with which the participant can compare himself to national norms.

Jogging involves more time and a known distance (which can be measured by car), but it is also more challenging and rewarding for many participants. A reasonable objective is the eventual mastery of a mile (again depending on the initial state of cardiovascular condition). First, aim for a quarter mile by jogging one eighth mile and walking one eighth. Then, jog the whole quarter. Follow this pattern with a half mile, three-quarter mile, and finally a mile. At this point, try to reduce the time necessary to jog the mile, setting a goal such as a six minute mile (that's no jog!). From this point, additional distance and/or decreased time are useful objectives.

Fartlek is an older, informal type of interval training whereby jogging, sprinting, and walking in the woods or by a lake are alternated according to the runner's desires.

Circuit training. Circuit training is a method of conditioning which combines static and dynamic strength gains with cardiovascular endurance gains. The principle of overload is central to circuit training. The circuit is a specific number of exercises (stations) performed in a sequence within a given time span. Usually, the circuit is repeated two or three times, all within a given time span. Circuit
training is highly adaptable to most conditioning objectives, because the individual can select his own exercises and time intervals. In preparing a circuit, care should be taken not to exercise the same muscle groups at successive stations and to select load and repetitions one-half to two-thirds of maximum for each exercise (at least two-thirds for a two-lap circuit).

Power.-- Power is defined as work per unit time (how fast a certain amount of work can be accomplished). Although identified as a separate conditioning factor by Fleishman, it has traditionally been considered as a combination of speed and strength. However, Start and his associates have shown only speed to be related to power. It is usually measured by the vertical jump or standing broad jump.

Speed.-- Speed refers to a timed movement through a specified space. Although occasionally subdivided into power and speed of limb movement, the concept of speed is more often related to dynamic strength and flexibility.

Agility.-- Agility is usually defined as the ability to change directions, but there is some evidence that this factor is not a separate goal of conditioning but instead represents some combination of speed, flexibility, and balance.

Balance.-- Balance is the ability to maintain equilibrium in various positions. There appear to be two separate or unrelated types of balance: nonvisual (eyes closed) and visual.

Coordination.-- Coordination refers to general motor ability, but Henry has shown that coordination is specific to a particular task and cannot be conceived as a general characteristic. A student who scores well on a motor ability test probably learned the specific skills at an earlier time.

Packaged programs.-- Aerobics is based on cardiovascular endurance exercises, allowing the participant to select from such diverse activities as walking, running, swimming, cycling, handball, tennis, golf and spot running on a weekly basis. Each activity is worth a certain number of points (depending on length of participation), and 30 points must be accumulated each week. The Royal Canadian Air Force 5-BX Plan is designed to provide flexibility, strength, and endurance in eleven minutes a day. It is a progressive program consisting of five basic exercises (usually some form of ballistic stretching, sit-ups, push-ups, and spot running) and 72 progressive levels which enable the participant to see changes in his condition. Cureton has questioned the value of this program for cardiovascular conditioning. Cureton's Home Exercise Program is similar to the 5-BX Plan except that ten exercises and only six progressive levels are involved. RSP is a minimal program of spot running, sit-ups, and push-ups. Speed Drill emphasizes static and dynamic strength (four exercises) with one exercise each for
power, flexibility, and cardiovascular endurance. Work and rest intervals are given for each exercise in six progressive levels (total time for the first level is 2:35 and for the sixth or final level is 11:05). Grass Drill consists of a variety of exercises (including sit-ups and push-ups) executed in rapid succession. Between exercises, participants run in place. On the commands "front" and "back," participants move immediately to the push-up (front) or sit-up (back) position, and on the command "stop" a football lineman's stance is assumed. Strength and endurance are emphasized.

Weight control is best accomplished by:
1) Cardiovascular endurance exercises
2) Sit-ups
3) Flexibility exercises
4) Strength exercises

The training method which utilizes successive periods of work and rest based on the three principles of overload, intensity, and adaptation during rest and which stresses aerobic (or anaerobic) development is:
1) Royal Canadian Air Force 5-BX Plan
2) Interval training
3) Aerobics
4) Circuit training

What are the chief advantages of spot running?
1) More rapid cardiovascular development than other methods
2) It uses minimal space and a minimal amount of time
3) It increases flexibility as well as aerobic capacity
4) There is little to recommend it

Power has traditionally been considered a combination of:
1) Coordination and agility
2) Speed and strength
3) Endurance and balance
4) Agility and flexibility

In order to decrease the degree of stiffness of a joint:
1) Use ballistic stretching exercises
2) Use static stretching exercises
3) Use the Fartlek method
4) No satisfactory method has yet been devised
Existing evidence indicates that significant improvements in the cardiovascular system can only be achieved if:

1) Heart rate exceeds 150 beats per minute for five minutes
2) Heart rate exceeds 180 beats per minute
3) A high blood lactate concentration is reached
4) Oxygen debt occurs

Which of the following aerobic methods can **not** be adapted to interval training?

1) Spot running
2) Continuous jogging
3) Bench stepping
4) 220 yard repetitions

Coordination refers to:

1) General motor ability
2) Agility
3) Aerobic capacity
4) The Valsalva effect

A regular program of interval training or other aerobic work will **not** necessarily:

1) Decrease heart rate
2) Increase total blood volume
3) Improve range of motion about the joints
4) Improve circulation of the cardiovascular system

Why is it important to distinguish between static and dynamic types of strength?

1) Because static strength requires five workout periods a week
2) Because training methods depend on which type of strength is desired
3) So that heart rate can be reduced more effectively
4) To prevent neurological damage

That form of running which involves an informal pattern of jogging, sprinting, and walking according to the runner's desires is known as:

1) Aerobics
2) Fartlek
3) Bench stepping
4) Circuit training

There appear to be **_** types of balance.

1) One
2) Two
3) Three
4) Four
Which of the following is not an advantage of static stretching (i.e., holding a stretched position for a period of time):
1) Decrease in the stiffness of the joint
2) Reduction of the danger of exceeding the extensibility limits of the joint
3) Relief of muscular soreness
4) Less energy is required than for ballistic stretching

When using weight training to improve static strength, it is necessary to:
1) Select a weight which can be lifted eight or ten times
2) Select a weight which can be lifted at least fifteen times
3) Select a weight which can be lifted only four or five times
4) Eliminate the use of isometric exercises

What method of conditioning combines static and dynamic strength gains with cardiovascular endurance gains by the use of a specific number of different exercises (or stations) performed in sequence?
1) Aerobics
2) Grass drill
3) Bench stepping
4) Circuit training

Which of the following conditioning goals have yet to be clearly understood?
1) Static strength and cardiovascular endurance
2) Agility and coordination
3) Speed and balance
4) Cardiovascular endurance and balance

The lower back pain that adults often experience is largely the result of:
1) Daily exercise
2) Muscular stiffness and weakness
3) Static stretching
4) Ballistic stretching

Apparently, the isometric method best develops:
1) Flexibility
2) Cardiovascular endurance
3) Dynamic strength
4) Static strength
Which of the following principles is basic to circuit training?

1) The majority of exercises in the circuit are for flexibility
2) The time limit for the circuit is the same for everyone
3) Load and repetitions should be one-fifth of the individual's maximum
4) Do not exercise the same muscle groups at successive stations

Which of the following programs has as its primary objective cardiovascular endurance?

1) Royal Canadian Air Force 5-8X Plan
2) Speed drill
3) Aerobics
4) Grass drill
APPENDIX IV

QUALITATIVE SELF-ATTITUDE RESPONSES

These statements are reproduced exactly as they appeared in response to the questions: 1. What I like most about myself; 2. What I most dislike, and how I hope to change.

I. Positive changes for four day experimental group

1. Broad shoulders 2. Lose some weight in my legs.
1. That I am able to compete and do as good or better than most others. My chest and shoulders are filling out good. 2. My fat legs need improvement still.

1. straightforward, at least moderately physically fit, at least an average intelligence. 2. wasteline, quick temperament.
1. I am pleased with my General physical ability and my ability to attain new skills easily. 2. I dislike one or two aspects of my physique and wish to change them.

1. I never give up trying to do something, whether it losing weight or passing a course. 2. Overweight - lose weight by taking this conditioning course and not go on a diet.
1. My ability to adjust to most situations, and my good personality which would be helpful to me in later life. 2. The fact that I am over weight. I hope to change this by losing weight by exercise.

1. My accuracy and steady hand in Bowling (160 ave.; 203 high), pool, darts, pistol shooting. And my tendency to get outdoors in hiking, camping, bicycling and canoeing. 2. My acute case of laziness and my smoking habit. College should do something for this laziness and this course should do something for my smoking.
1. Manual Dexterity, endurance, lovable personality 2. Laziness -? Smoking - I've merely cut it by half

1. I have a good mind and a body with no intrinsic flaws, such as a heart murmur. I have potential. 2. I have realized little of my potential. This is, I have done little. That is, I have lived little. That is, I have merely existed.
1. I have stopped changing for the worse and started changing for the better. 2. My times in the mile and my distances in the 12-minute run are far from where they ought to be. However, my endurance is
adequate compared to my overall strength and agility. I hope to work out on my own, possibly with the help of a partner.

1. decent reasoning ability. 2. give up too easily - keep persavering. Not too agile or atheletic.

1. I can handle myself fairly well in most situations, whether they are physical, social or mental. 2. too relaxed about things, need to care a little more. inability to keep up with everyone. Try to work harder.

1. I like to think that I am always open minded, willing to listen to anybody saying anything or able to talk to anyone. I live as I choose and am proud to be able to live with these standards. I also have high goals for the future and hope to be able to work hard enough, well enough to achieve them. 2. I hope to find my place in life and then speed towards it. I most dislike narrow minded people or people who are able but unwilling to understand or accept happenings or people as they are. The conditions many people live in. To change myself for the better.

1. My generally happy manner of personal interaction and my capability, physical and mental. To do anything I wish in the best manner possible. 2. All the faults that I do know exist altho I couldn't make a list of them. Hope to change as soons as possible and the best way as possible.

1. My Friendlyness, my good intensions. 2. My quick temper, my failures, my poor intelligence, my out-of-shape body, my un-christian like activities.


II. Positive changes for two day experimental group

1. My overall relations and adjustment to my environment. My feeling toward others. My ability to contain myself at (usually) depressive moments. My overall outlook on life. 2. My physical stature, by daily exercise and conditioning. My self reliance (at times) toward others more fit than myself.

1. Even though my body is not up to par I still feel a sense of enlightenment. I feel positive toward many goals and self-reliant. My faults, I have, but feel are outweighed by my positiveness. I feel that I might gain more reliance in myself if my body was more conditioned.
2. The only dislike I seem to have is my ability at times to feel "left out" of certain activities, not that I am not asked, just that I am not truly informed in many sporting areas and "rules of play." If I could delve into these "rules of play" a little deeper, I may dismiss this problem.

1. My drive and desire, what little I have. 2. My little intelligence and all around fitness.

1. I want to try to do everything for myself and be involved in a lot the activities all the time, instead of being useless and sitting around all the time. 2. For one thing, those darn situps which I can't do efficiently, but will keep trying. I won't try to give up in conditioning because it now seems worthwhile to keep doing.

III. Positive changes for control group

1. Is the way I forget that I am heavy and do laugh at it. I don't think I would like to be real thin but I wish to be a little trimmer and firm. I think when I do lose weight I become grumpy and very nervous. 2. Is my voice and some of my actions. People have the idea that I'm different in that my voice is high pitched and I'm told walk like a girl. I hope something changes in my body or I try real hard to control them with exercise.

1. I think I'm smart in some areas, also. I'm able to do something very good in a way. Painting, dancing, and making people laugh. I am very friendly and do make people admire me and try to set a good example in some areas. 2. I wish I were a little thinner and I usually stay around 180 all the time it might vary at times. Be a little more mannish in my activities and actions.

1. I am of light weight, and as a result I've been quite able to keep myself physically fit. It does not require too much for me to run long distances. 2. I tend to postpone my physical fitness exercises and as a result I don't do as much of it as I would like to.

1. I am lightly build and I have a strong feeling that I could make a track and field man. I am patient with others and friendly. I like to know more people. Above all, I have been quite successful in all the things I have done so far. 2. I tend to put off things for tomorrow. I like to change it. At times my will-power does not seem to be of high standard.

1. My arms are quick and well-coordinated. 2. I tire easily and don't have added strength.

1. I have enough will power to most of the things I want to do although it is hard. I have good coordination in hands and arms. 2. My legs are not very strong and I fatigue too easily.
1. Above Average in almost everything I do such as school work or athletics. Don't have any real enemies and lots of good friends.  
2. I am not excellent in anything - not the best. Rather shy and quiet.  
   
   1. I can do almost anything I want to do. Can do most things better than the average person without much effort. Have a lot of friends and few if any enemies.  
   2. Many times I do not try as hard as I should because I do not need to try hard to be better than average. I have never put forth my full effort on anything.  

IV. Negative change for four day experimental group  

1. I think what I like most about myself is my faith in dedication. You can never achieve maximum performance in a program if you do not take complete advantage of it.  
2. I most dislike my feelings of despair when I really get set back at something I work hard at. The only way to change is to put aside my despair and try again.  
   
   1. Not very much.  
   2. My inability to work to the fullest of my capabilities for a sustained length of time. I don't know.  

V. Negative change for two day experimental group  

1. My general good health.  
2. About 10 extra pounds - diet. Inability to continue a sustained effort, lack of a goal.  

VI. Negative changes for control group  

1. Tall, fairly, strong, better than average in most sports, better than average in brains, better than average in looks.  
2. Too thin - hope to exercise and eat more. I easily become nervous - (change?), lack confidence, can't swim, shy, sometimes clumsy or awkward, can't grow a beard. Rats!  
   
   1. I'm not ugly, I'm pretty good at most sports. Not too much.  
   2. I'm too lazy - become active, I'm too slow - exercise more, I'm too thin - eat more, I'm too illogical - think more. I can't swim - take swimming lessons, I can't dance - take dancing lessons, I can't rap to girls - stop being shy. I'm not to agile - coordinate myself.  
   
   1. Responsible, dependable, like sports.  
   2. What I most dislike about myself is that I have no self-confidence. I doubt if I could change now, because my character is set and it would be very difficult for me to change it.
VII. No changes for four day experimental group

1. Can just about take any kind of physical exercise, healthy, individualistic type. 2. Weight (underweight), slight build.
1. Perfect health and ability to withstand a lot of physical exercise. 2. Small shoulders and chest muscles, and want better agility and control of body.

1. The ability to make friends easily is what I like most, but sometimes I try to hard. 2. (My beer gut and all excess fat.) I dislike my talkativeness which I feel sometimes others dislike.
1. My ability to make friends easily and to trust people - I feel also that I am able to compete on the same plain as others. 2. I would like most to change my short temper - I feel this will only be accomplished by a well disciplined mind.

1. Nice complexion, not over-weight, healthy, good teeth, hair, nice personality, out-going. 2. I would like to lose some excess fat off my thighs, stomach, and rear. I would like to develop my wrists, forearms, biceps, chest some more.
1. Good health, nice complexion, pleasant personality. 2. I would like to have a stronger body. More muscles, lose some weight. By lifting weights, playing in sports, and eating the right foods.

1. I am a fair person, when it come to what people deserve. Personality is good. I like people and the world. 2. Talk to much, and I'm always putting my foot in it. I'm weak in character.
1. I'm not the biggest strongest guy in the world, but I get along with people and this is what I like most about myself. 2. I'm flabby and I'll keep weight lift to remedy this problem.

1. Size, studyness, strength. 2. Lack of endurance, too fat.
1. Size. 2. Over weight.

1. I think I am fairly well rounded and capable of adapting to most circumstances. I also pride myself in that I stand up for what I believe and am usually not influenced by "what everyone else does" (like I don't drink or smoke) 2. Sometimes I have trouble forgetting some things that are better left forgotten. Occasionally my will power to pursue worthwhile goals wanes a might and I am rarely satisfied with my personal achievements (sometimes, however, I think this is good)
1. My ability to accept most situations and my versatility. I feel that I am fairly open-minded and fair at judging others and in considering various things. 2. Sometimes I feel that I am too diversified, I can do most things half way well, but I am a master of nothing. Sometimes I get depressed when I don't do things very well and possibly am too rough on me.
1. Is my ability to end something I start. No need to be dependent upon other people. My own individualist tendencies. 2. The physical wreck I am because I let myself go. I still need more self confidence and determination.

1. my ability to rise to a given situation under pressure. I manage to squeek thru in the clutch. My determination to make my body physically fit at all costs. 2. Sometimes I rely on others too much. Also I tend to put things off until its almost to late to do anything.

1. My personality, my adaptability, my legs. 2. My smoking - quit, my fat - exercise, my disuse of limbs without exercise, my bad leg - therapy.

1. I like my attitude towards anything. I've never had a negative attitude 2. I dislike my smoking habit the most and I hope with future exercise and work-outs that I understand the need for quitting so that my body will be as healthy as I allow it to be.

1. What I like is that I am physically in very good shape. After 6 months in the Navy and 2 years working in Lumber yards and construction I don't feel as self-conscience about my appearances toward others. 2. I dislike most is the "pot belly" and smoking. I am constantly exercising at my job but my stomach seems to not get any firmer. I intend to drop smoking because it cuts down on my endurance and other things. It will be a challenge to stop smoking because I have smoked the for five years.

1. My ability to be able to lift heavy objects without straining myself. After the Navy and working in lumber yards, and weight-lifting, I found there is right and wrong ways to lift up objects. I also like the fact that I am not overweight any more. 2. My habit of smoking cigarettes, which I hope to drop this summer. Smoking cuts down considerably on lung capacity in a vigorous training excersize.

1. My bicep development after weignt lifting. My chest development after weignt lifting. 2. My flabby stomach

1. My arms (biceps) (triceps) and my chest. 2. My leg (to small diameter) and stomach (flabby) which I am working on in changing.

1. Discovering myself. Abality to meet with other people. Abality to meet and get along with people (other than my parents), enjoy life, see into problems, define goals and try to obtain an objective, enjoy sports that I do well in. Also enjoy canoeing out of doors. 2. My muscule coorination - awarkwardness, my weight - too light - will gain, my general frame - tall slim weak, because of light frame I can't enjoy some hard sports. Football etc. Because of weight I catch cold easily hope to become more sturdy.

1. I'm not quite sure. Generally though I'm in agreement with myself and happy. 2. I would like to gain more energy to live at a faster pace. Would like to become determinted. Have more self respect and confidence. Shoot towards specific goals. Would like to acquire and maintain self-discipline.
1. My superior intelligence, handsome face, character, ability to enjoy life. 2. Soft stomach, poor muscle tone, excess weight.

1. My good looks (confidence). General ability to comprehend our society and function within it. General satisfaction with my ability to improve upon my activity: mental, physical, social, emotional by the application of will and practice. 2. A little more excess weight and smoking. Having run for the first time in many years demonstrates an unnecessary deterioration. All you need is the will.

1. I have above average intelligence, I am calm under pressure, I have good coordination, I am confident in my abilities and I know my limitations. 2. I have a temper I must correct often. I am lazy, and I need an incentive. I must develop better will power.

1. I am coordinated, and quick enough to react to most situations. This is added to above average intelligence. I am well-built, handsome, witty, entertaining, generally very interesting. Not modest but well aware. I am easy to get along with in most cases. Defender of goodness, crusader against evil. 2. Short-temper - more consideration necessary; Impatient - more patience with people. Lack self discipline - learn to have more "stick-to-it." Daydreamer - be a little more realistic. A bit too conceited - must learn humility.

1. I like the fact that I am me and no one else and proud of it. 2. I am heavy and I hope to lose weight.

1. I like myself because I am me and through this course I have proved to myself that I can help to improve myself as long as I work towards my betterment. 2. I dislike the fact that I'm still not fully complete to satisfy myself but I intend to work on it.

1. Football ability, keep trying, stamina, humble. 2. Out of condition, too shy.

1. Humble, honest, quiet. 2. Bad study habits, no appeal to women, give up easy, wrong attitude.

1. I have an open mind and realize that I am far from perfect and I know I have the capacity to improve myself in all respects. 2. I dislike the condition my body is in and after many years of living in this condition I've decided to do something about it. I am mainly interested in losing the excessive fat from my waist and to build up my stomach muscles. I especially want to improve my breathing and strengthen my heart.

1. I like the way my heart has responded even due to the fact I'm overweight. My blood pressure and heart rate have proved surprisingly normal even after excessive exercise. 2. I didn't improve the tone of my stomach muscles as much as I would like to. My body also does not lose weight as rapidly when I exercising regularly as when I not.
1. I am somewhat coordinated 2. I am too fat, too soft, too weak, too slow. I have poor breathing habits.
1. I feel my coordination is one of my best traits. I have never been uncoordinated. 2. I am too soft, there is a layer of fat over all of me. Also, my legs are extremely weak and skinny.

VIII. No changes for two day experimental group

1. I am very seldom sick. 2. under weight.
1. I am very seldom sick. 2. I would like more weight and larger muscles.

1. Being competent in all sports and have tried 2. Not having the strength and would like, and hope to change by doing pushups.
1. That I am able to compete with others on an equal par - my general body health is good. 2. Not being able to be the best at everything. I'd like to become more adept at my weaker points.

1. Most of what I like of myself is that I am about average in this world. Maybe in some things I am a little above, but never below. I might not be the greatest sportsman, but I try to participate in most activities pertaining to sports. 2. The thing I most dislike is that I don't have a strong V-man body.
1. The thing I like about myself is that I am not below average. What I do is done by the average human being on this earth. 2. If it is possible I would like to improve my abilities. To be better than average is not anything to be ashamed of.

1. My skills, ability to compete with others. 2. Physical shape, (looks)

1. Healthy. Can try all kinds of activities. 2. Little underweight - gain weight.
1. I like being able to do most anything I want because if I try I can understand most anything and can perform many acts. I like being healthy like I usually am because it makes things look brighter. 2. Sometimes I don't like myself because I don't always have enough confidence in myself. If I really try hard at something it usually turns out real good, but sometimes I almost give up before I start. So, I dislike being inconfident and I hope to become more confident in the future.

1. I believe my most favorable characteristic is my self discipline, pertaining to physical fitness. Also my ability to realize when I'm right and wrong. 2. I dislike my big mouth and hope to learn to shut it up.
1. The thing I like most about myself is my desire to improve
myself. I'm always looking for ways to become stronger and healthier.  
2. I most dislike my lapses in self discipline. I find it hard to stick to diets and the like. I hope to remedy this and lose some weight very soon.

1. Length of arms legs, lean, rugged and tough, can take punishment. 2. Weight, put on more; size of arms and legs, more bulk and strength; strength.  
1. Not fat, hard and fairly tough, strong for my size. 2. Not enough weight, not enough strength.

1. Usually I consider myself physically fit. I pride myself in being able to handle most physical activity fairly easily. 2. My two main goals are to (1) gain weight in the form of muscles and (2) improve my posture.  
1. I am able to compete and do above average (I think, anyway) on a physical level with no problem. 2. I would like to gain more weight in the form of muscle and I would like to improve my posture.

1. I'm healthy, I'm happy. 2. I want to become healthier, through this course.  
1. I'm happy, I don't worry to much, I don't let small things bother me.

1. I'm healthy, I'm usually happy, most of the time I don't worry, I have a wide range of interests. 2. I have trouble getting psyched enough for my classes to study, I'm not in as good a shape as I'd like to be, I don't participate enough.  
1. I seem to be able to adapt to about any situation and many things do not bother me as much as others. I try too give 100% in everything. 2. Sometimes I'm too much of a loner and don't interact with others enough. I hope to change to a degree by participating in more outside activities.

1. Tall plenty of range. Smoothness of movement. Slightly agile; or light on my feet. 2. Too thin; small frame - Build and develop. No weight compared to my height - Gain good weight where it helps most. Too slow - Build up speed to equal my quickness.  
1. That I have the ability to get better physically fit and improve on my health 2. I dislike not having endurance for long distance running, and I'll work on it by having interval training sessions 3 times per week.

1. Occasional flashes of perseverance and mental acumen. 2. My body tends to get soft very fast and muscle tone is very hard to achieve. I would like to run faster and improve my endurance. I would like to be taught how to kick a soccer ball correctly.  
1. The ability to put out intellectually when prodded and the ability to study. 2. Inability to be consistent in every-day life, as probably shown in answers to prior questions on this test. I hope to
change by completing my education and thereby disciplining my mind.

1. Scholastic ability 2. Physical unfitness
   1. I like the fact that I'll scholastically more capable than most of my fellow students. I don't have to study as much. 2. I wish I were in better physical shape. A little less weight or fat, and a little more muscle. I wish I had more enthusiasm for physical activity. I guess I'm lazy.

1. Hustle, participation, team spirit. 2. Extra fat, weak arms and mid section.
   1. I feel I try to improve myself mentally and physically. I work at most things with dedication and a positive attitude. 2. I need to better condition myself and try to be better rounded in all fields of study and every day life. Physically I still need a lot of work.

1. I feel that I am able to tackle mental and physical goals without too much trouble. I have pride in my qualities. 2. Somewhat slow reaction time. Slight nervous condition.
   1. I set a goal, then work the best I can to obtain it. I don't give up easily. I believe in what is right, and I will stand up to defend it. I can get along with everybody. 2. I am underweight. I have a slight superiority complex and sometimes expect too much from myself.

1. I have much desire in the things I do. I am physically fit. I have a brown belt in judo and this took much work on my part. 2. I am not as strong as I would like to be and my body is not rugged and muscular. I hope that this course will change that to some degree, especially my stomach.
   1. I am healthy and physically fit to a large extent. 2. I would like my body to be a little more developed and good-looking.

1. Personality, speed for my size, well-rounded knowledge. 2. Overweight, poor condition, sleeping habits, inability to play basketball.
   1. Strength when it comes to a fight, large body size. Attitude toward organized P.E., pride. 2. Fat covers the muscle, hair too long, speed slowing down, laziness toward school work, lone life.

1. Fairly intelligent, get along with people well, enjoy most activities. 2. Overweight, under developed, not physically fit.
   1. Team spirit, stamina, intelligent. 2. Overweight, soft stomach.
IX. No changes for control group

1. Physical appearance, mental stature, compatibility with others. 2. My moodiness
   1. My general intelligence, good looks and personality. 2. My present state of physical fitness (lack of)

1. I stick to a job until I have completed it to my satisfaction. 2. I lack the coordination to participate in some athletic activities. By exercising more often I hope to improve this coordination.

1. I adapt quickly, get along with people well, have a good sense of humor. 2. Can't study well, dislike manual labor.
   1. I can adapt to different situations easily. Easy to get along with and like people. 2. I don't study enough and I have to force myself to change that. I want revenge on people that make me angry and I just should change my attitude about things like that.

1. The way I'm interested in sports. 2. more sporting activity
   1. I like all kinds of sports. 2. I don't participate enough in sports.

1. My ability to adapt to environment such as different sports - I am average or even something average in about all sports - I like just about every sport. 2. I can't do quite as many exercises as well as I would like to be able to do. I have problems at times getting enough exercise to keep fit.
   1. My ability to stick with any job I'm given whether hard physical or not to enjoy what is to be done 2. my ability to do pull ups. and ability to run faster etc.

1. I am able to participate in most everything in the sports field. I also am capable of attaining above average grades. 2. I would like to be able to participate with more accuracy and be better in some sports.
   1. My ability to reason with a good mind and my healthy body. 2. Not as strong as I would like to be and I would like to be stronger.

1. Fairly co-ordinated when participating in most activities and ability to maintain my standards that I have set. 2. I am not as strong physically as I want to be.
   1. I can accomplish almost any thing I want - if I'm interested enough to try 2. To become more interested in more things.

1. I rarely get discouraged, I rarely get mad or anger, I like people, I am usually quite happy. 2. I have a tendency to foul up often and I get disgusted with myself. I'm too easy going. Not sure what to do.
   1. I like to think I am optimistic and have an open mind. 2. I'm
overweight and I hope to lose weight.

1. I won't give up when the going gets tough. I stand up for what I believe in. When I set my mind on attaining something I usually reach it. 2. I am constantly tense and worried about money, school, etc. I have a quick violent temper that is very hard to control. I wish I could find a form of exercise that would help me relax.

1. I don't give up. I hang in there. 2. My temper; I loose it easily.

1. The thing that I like most about myself is my ability to get along with other people. I'm very relaxed, and I enjoy mixing with others. 2. The thing I most dislike about myself is my inability to have confidence. Although I feel that I do many things very well, I have never been really superior in anything. Thus the lack of confidence.

1. I like my intellectual capacity and my general build. Although I am neither a great athlete or a genuine scholar, I feel I have some of the qualities of both. 2. What I dislike most is my lack of confidence and the recent loss of a physically fit body. I hope to improve both of these deficiencies in time.

1. My ability to communicate 2. No will power - work hard, lazy - work hard.

1. I like my ability to communicate with people. 2. I dislike my overweight problem and hope to loose some weight.

1. I like the way I'm not overweight. I'm not too far from being underweight and my arms aren't the largest but I feel I can compete with anyone in my class in doing chin-ups, sit-ups, running, etc. 2. I want to have bigger biceps by lifting weights.

1. I like the way I am lighter and shorter than everyone else but I can still compare in most sports. For example, there might be a big guy who can naturally play tackle in football better than I but when one big guy tries to compete as a halfback or in swimming then he's not so big. 2. I most dislike my ability to foul up a weightlifting schedule. I hope to lift weights regularly after finals week.

1. The part of me that impresses me the most is my ability to put forth a kick at the end of things I do. 2. I am not consistent in many of my undertakings. I start something (lifting weights) but I keep putting my work out time back.

1. I think the thing I am most lucky about is my health. I really have no problem keeping myself healthy unless I don't use my head. I feel if I ever had the chance to prove myself (body-use), a little conditioning would do it. 2. I still don't have enough willpower to resist the things that aren't good for me. I goof around some in my studies and it shows. I feel if I could mentally condition myself to my problems, I could pretty well take care of most of my problems.
1. Am fairly quick to learn things. I am a hard worker when I feel it is necessary. 2. I dislike insensitivity and I am not quite sure how I will change or if I will.

1. I like myself as a person who makes friends easily. Also, I like my competitive spirit although I don't mind losing very much. I can take defeat gracefully which is just as important as winning. 2. I am dissatisfied with my body condition but I am not worried to much about changing it. Also I dislike my attitudes toward study. And not sure how to change this but I hope a can.

1. Can perform very well in both the classroom and the gym. 2. I am not really big enough to compete in college athletics.

1. I am honest at all times. I set high goals that require hard work to attain, and I usually attain them. My body and mind function efficient enough to satisfy myself. 2. I become too tense at times. I sometimes wait too long to do things that are necessary.

1. What I like most about myself is that I make an effort. 2. I tell my wife how to cook.

1. I have a good ability to work hard especially when I have too. Sometimes I work 17 hrs. a day in the summer. 2. There's not very much I dislike except having a hard time holding my concentration for long periods of time. I have a hard time relaxing sometimes.

1. What I like most about myself is how observant I tend to be. There is not too much that goes by that I miss. I see people's habits - and things that happen around me in everyday life. 2. The habit I have of talking too much and tending to other people's business. If I can overcome this I think I would be a better person.

1. Often times people underestimate my ability. Really I am an achiever. I might start off at the bottom, but as time goes on I somehow manage to do much better than most people can believe. I am useful and enjoy helping people. 2. What I dislike most about myself is my ignorance toward sports and mechanical things. I'm not really that interested in these things but it seems hard to take when you're around a group of fellows talking about sports cars and you really don't know the first thing about them. This annoys me sometimes. I plan to read up on sports and participate some in sports at college. And as far as cars and mechanical things go I can probably pick them up at a late date.

1. My ability to think rationally without wasting my thoughts. 2. My inept ways to avoid study. I hope to change by growing up.

1. My inept ability to think rationally and reason things out. My ability to do things without having to "follow the crowd." 2. My physically-looking weak body. I'm exercising regularly.
1. I like my general good health, my good thinking abilities. I like my ability to respond to new sports both indoors and outdoors. 2. I would like to put on more weight and not appear thin. This will change as I get older I believe.

1. I like my ability to cope with new situations and experiences. I like my ability to adapt to new sports without much problem. I like my general state of health. 2. I dislike most my somewhat introvert personality. This tends to sometimes hinder me.

1. I most like my ability to get along with others and to be able to talk to anyone. I like to help others with their problems if they come and seek my help or advice. 2. I most dislike my attitude which I have at home for my family. I treat them entirely different from anyone else I know. I wish I could adopt the attitude I hold away from home to the home situation.

1. I will try my best at anything and usually I come out doing pretty well at it. I also feel that I get along quite well with people and can usually talk to anyone because I just like people and like to be around them and am always willing to help them if I can. 2. I dislike most right now my own body. I don't feel it is in good shape and has too much fat on it. I hope to go on a diet and a regular exercise program in order to get it the way it should be.

1. What I like most about myself is the way I can get along with people. If they don't do anything or say anything that go against what I believe, I can get along with them. But I also know when they mean it and when they don't. 2. The way I can hurt people physical or mental is what I hope to change.

1. is the way I can get along with people. 2. is my temper. I hope to change it by watching myself very carefully.

1. My tendency to have above average mental abilities in some areas. My positive attitude toward most things. 2. I am underweight. I would like to become stronger.

1. I have above average mental capabilities. I do what I think is right. I have a fairly positive attitude. 2. I tend to be thin. I would like to become stronger and gain some weight.

1. I can do many things. 2. My attitudes toward other people. I'm going to try to be more sincere.

1. That I can do many things fairly well. 2. My tenseness. I wish I could take things with a little more relaxation.

1. My coolness. The way I act in a group and around girls. 2. My bad study habits.

1. My overall coolness and ability to get things done. 2. I dislike my "smart-aleck" talk and cursing.
1. What I like most about myself is the feeling of being above knowing that I possible can be of some help to the world. 2. What I most dislike about myself is my inability to stay healthy. I always seem to become sick.

1. My ability to do what I like to do and what I can do best. 2. I dislike my inability to do certain things which I know I can do but just can't do it right.

1. My ability to get women and my brain. 2. Nervousness, tense, impatience.

1. My ability to get girls and friends. My ability to understand things. 2. Tenseness - play it cool. Disappointment attitude - realize my situation and others' situation's.

1. I am generally able to participate in all types of sports which I am quite good at or at less better than average. 2. That I do not weigh more and am not physically muscular as I would like to be. I don't want to be muscle-bound but just heavier.

1. Ability to excel in any area in which I am really interested, whether it be sports or school. Sports especially give me a gratification of knowing am superior in performance to most of the other students. 2. I would like to build up myself in both weight and muscle. Not to point were I would loose my good coordination but so that I would be healthier in physical conditioning.

1. I like my facial features and my way of expressing myself. 2. My weight and size. I hope to grow and lose some weight. On the future I would like to firm my body.

1. I like my ability of perception. I like the way I can easily adapt to different environments and the easiness of which I meet new people. 2. I dislike the fact that I procrastinate a lot and that I am very shiftless. To correct this I plan to do go about doing my responsibilities with more enthusiasm so to possibly attain a new set values so I may become more constructive rather than shiftless.

1. I feel that I have a more than average will to learn. I enjoy reading and studying and sometimes think of finally learning "What it's all about." 2. I have little time for exercise and I am out of shape and a little overweight.

1. My abilities like more toward mental than physical activity. I am fairly good at subjects involving technology and I find these quite stimulating. As far as sports go I am fairly good in a variety of these. 2. I have gotten far "out-of-shape" in the last two years. I am slightly overweight and do not feel as good as I should. I would like to be able to exercise more in order to improve my well being on the whole.
1. What I like most is that I don't feel any real dislike for anybody. I try to and usually can accept people for what they are. I'm pretty easy-going. 2. What I don't like is my shyness because this gets in the way of making friends easily. I hope to change by taking more part in discussions, etc.

1. What I like is that most of the time I'm pretty easy-going and can usually control my temper. Some people have really aggravating little habits which can cause you to lose your temper and usually I don't let these bother me. 2. I don't like my shyness and I hope to change this by taking more part in discussions and saying what is on my mind and not keeping things to myself because of what others might think.

1. The ability to exist as a human being: My ability to want to help the less fortunate than myself 2. My ability to become on occasions prejudice. I suspect its normal but I hate any kind of prejudice in anyone. Change: to control and do away with what ever little prejudice I have consciously or unconsciously.

1. Being able to live an existence as a human being, by far the most interesting creature in the universe. 2. Making quick and fast judgements about people just by what they look like or say at first glance.

1. Confidence is most of what I like about myself. 2. Not being serious enough

1. The way I carry myself 2. over confidence

1. Tennis ability, love for helping small children. 2. Unmarried, no children.

1. My love of sports. 2. Overweight.

1. Learn quick, not perfect, nearer the top half than the bottom half, never broke a bone in my body. 2. Forget easily sometimes, afraid to try something new; don't always try hard enough.

1. My capabilities 2. My inaccuracy - my lack of memory - (Practice makes perfect is my motto.)

1. Able to control myself, good grades, being able to letter in golf and cross country. 2. Improve my body, study harder.

1. I participate in a number of sports. The sports I participate in are enjoyable, such as golf, and hard, such as cross-country. I like to play almost any sports. 2. I hope to develop my body more. Some times I feel my body is too weak. I hope to improve myself by working out everyday.

1. I don't care that much about anything so I don't have many worries. Hardly anything can put me in bad humor. 2. Other than my feet being a little on the big side, I can't think of anything that I
dislike.
1. Almost nothing can put me in bad humor. 2. Nothing I can think of off-hand. I'm satisfied with my health.

1. What I like most about myself has nothing whatsoever to do with physical fitness. I am most proud of my ability to reason and make intelligent decisions. 2. I dislike my intolerance of other people, and I am trying to understand them more.
1. I am most proud of my ability to understand why people do things, and to change their behavior to fit my needs 2. My ignorance bothers me more than anything else. There are so many things about which I am confused because I don't have all the facts.

1. I like most of all the general philosophy on life and toward other people; a philosophy that places the highest value on life, because it ends, recognizes the inevitability of change and flow, places ordinary pleasures and delights highest, and views people and human love in a highest place because they and I are mortal. 2. I most dislike my hesitancy to meet and get to know them. I hope to break out of this as I did out of near madness, that is by the use of philosophy and reason.
1. I like most my outlook on life; one that does contains almost none of the misconceptions of nationalism, political visionary schemes, racial prejudice, hard and fast dogmatic religion with its accompanying religious intolerance, or personal failings like vanity, vengefulness, hatefulness for others, or unrealistic ideas about people and life in general, (to the extent of my experience thus far, anyway). I think my attitude toward people is excellent, if not always my outward disposition. 2. I still wish I could be more effective in projecting myself. I regret that I do not have a great sense of humor.

1. Quite a bit of endurance 2. Uncorrodinated, not much muscle tone, not as strong as I should be, not much athletic ability.
1. Relative calmness in a stressful situation 2. Inferior personality complex

1. My ability to adapt to different locals in environments 2. Overweight
1. Capabilities as a musician and the ability to create original works. 2. Overweight - I'm about 20 lbs. overweight. Acne problems

1. Is my will and determination to succeed in whatever I am doing. The spirit of being competitive 2. Is my ability to lose interest at times.
1. Is my desire to good, to accomplish some deed or act which would be benificial to myself and those around me. I think I am unselfish and would be willing to undergo personal discomfort to assume a position of leadership. 2. I dislike my sometime lack of thoroughness for sometimes I think I am careless and overlook simple things
which could be of significance. At present, I am orienting myself to be more observant and am making an effort to be 100% thorough.

1. Quick to learn, ability to remember, fairly agile. 2. Overweight - normal or at least more physically fit

1. My quickness to learn, my ability to understand 2. I am overweight, but in this quarter I have lost 15 lbs, I feel I'm on the road to being more physically fit.
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Abstracts


