

THE EFFECTS OF PHYSICAL FITNESS AND BODY
CATHEXIS ON SELF-CONCEPT CHANGE
IN WOMEN AFTER AEROBIC
CONDITIONING

By

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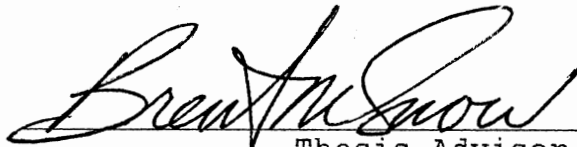
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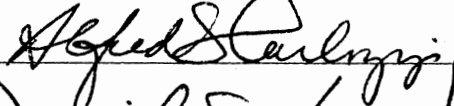
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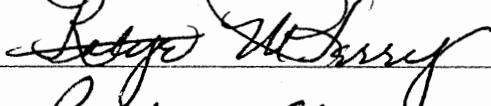
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CHAPTER I

INTRODUCTION

The recent explosion of interest in physical fitness and exercise has forced many mental health professionals to consider physical activity as a component of promoting psychological well-being. Exercise has been commonly linked with mental health in the literature but the research in this area is equivocal (Folkins & Sime, 1981). Additional experimental research investigating the relationship between physical fitness and mental health is necessary before psychologists and other mental health professionals can begin to utilize physical conditioning as a viable treatment modality.

Research examining the interaction between mind and body dates back to Hippocrates, who developed a doctrine relating physique and temperament (Tillman, 1965). During the early part of the century, James (1890) and Cooley (1922) stimulated interest in self theory and led the way for researchers examining the relationship between physical and psychological aspects of the self. The assumption of a positive association between physical and psychological well-being was pervasive, though controlled research validating this presumed link was sparse.

Secord and Jourard (1953) were among the first researchers to demonstrate that feelings about the body (body cathexis) were commensurate with feelings about the self. Their findings were consistently replicated in correlation studies by Weinberg (1960) who found the correlation to be significantly higher for men than for women, and by Zion (1965) who demonstrated the same relationship using different measures of self-concept and body concept.

Following the establishment of a significant linear relationship between self-concept and body concept, researchers began to investigate specific variables that contributed to the correlation. Jourard and Secord (1954) investigated size of a body part as a probable correlate of the degree of satisfaction felt toward that part. Their findings demonstrated the existence of a shared ideal for certain dimensions of the female figure. When examining differences in body image and self-concept between the sexes, Jourard and Remy (1957) concluded that women tend to have a more highly differentiated body image, but not self-concept, than men. Their findings suggested that women's body images are based on perceptions of specific body parts to a greater extent than men's.

After research findings indicated a correlation between size of a body part and satisfaction felt toward that part, Rosen and Ross (1968) showed that the relationship between attitudes about the self and the body

are also a function of the subjective importance of specific body aspects. In a partial replication of the Rosen and Ross study, Lerner, Karabenick, and Stuart (1973) failed to obtain similar results and concluded that gender differences must be considered when examining general relations between body attitudes and self-concept. Mahoney and Finch (1976) provided some resolution of the previous inconsistencies by indicating the relative contribution of feelings toward specific body parts to self-esteem level. It was demonstrated that a very small number of total body parts accounted for most of the variance in self-esteem for both sexes.

During the 1970's, research shifted from correlational studies to designs investigating the effects of physical fitness activities on personality variables. Collingwood and Willett (1971) reported positive changes in self attitudes for teenage males who participated in a three-week, jogging and swimming program. In one of the few studies using random assignment of subjects to treatment groups, Collingwood (1972) found significant improvement in body attitudes and self-acceptance for rehabilitation clients participating in physical training for four weeks. Hilyer and Mitchell (1979) reported that college students participating in a running program made a significant gain in self-concept. The greatest change occurred in students who initially had low self-concepts,

while minimal changes in self-concept occurred among high self-concept students.

Though it appears that past research has demonstrated positive psychological changes following increased physical activity, a recent literature review (Ben-Shlomo & Short, 1983) concluded that these changes are much more consistent for rehabilitation groups than for individuals with no disabilities. They reported:

While participation in exercise programs resulting in improved physical fitness has been shown to positively affect self-attitude measures of individuals with physical, emotional and mental disabilities, results of studies using normal, non-rehabilitation subjects have been contradictory and inconclusive (p. 19).

For non-rehabilitation individuals, the effects of variables such as initial physical or psychological condition, personality characteristics, and frequency and duration of training warrant further investigation. Additionally, the effects of exercise modalities other than jogging and running should be examined, since these training programs have been studied extensively in previous investigations. Thus, additional research is necessary to further clarify the relationship between physical conditioning and changes in psychological well-being and to identify the significant variables that affect these changes.

Statement of the Problem

The problem that this study addressed was the possible influence that participating in an aerobic dance class had on self-concept, and how this influence varied according to age, physical fitness level, degree of body cathexis, and level of physical activity. The problem of the study may be clarified by asking a number of questions:

1. How does participation in an aerobic dance class affect self-concept?
2. Is there a significant relationship between level of physical fitness and change in self-concept?
3. Is there a significant relationship between degree of body-cathexis and change in self-concept?

The problem this study examined was important for a number of reasons. First, the study added to the limited literature on the effects of physical activity among women between 20 and 50. Second, it was one of the first studies to control for subjects' level of physical fitness and age. Third, the study contributed to the resolution of the contradictory results in studies using subjects with no disabilities to examine changes in self-attitudes after physical fitness activities. Finally, the study offered ways of facilitating improvements in self-concept among non-clinical populations.

Definition of Terms

The variables of interest in this study are listed below:

Aerobic Dance is 24 hours (one hour, three times per week, for eight weeks) of physical conditioning consisting of 10 minutes of stretching to warm up, 25 to 30 minutes of cardiovascular conditioning consisting of rhythmic choreographed dance routines where subjects work out at 70-85% of their maximal attainable heart rate, 15 minutes of toning and upper body strengthening exercises, and 10 minutes of stretching to cool down.

Body cathexis is the degree of feelings of satisfaction or dissatisfaction with the various parts or processes of the body. It is defined as a score on the Secord-Jourard Body-Cathexis Scale.

Change in Self-Concept is the difference between the pretest and the posttest score of the Acceptance of Self scale of Bills Index of Adjustment and Values.

Physical Activity is the amount of time subjects spend per week in aerobic activity (jogging, swimming, rowing, etc.) and the amount of time per week subjects spend in nonaerobic activity (walking, weight lifting, etc.).

Physical Fitness is a score on the Cooper 12 Minute Run-Walk Test.

Self-Concept is the stable, descriptive perceptions individuals hold for themselves in terms of ability, value,

worth, and limitations that are influenced by the environment and used by individuals to compare themselves to others. It is defined as a score on the Bills Index of Adjustment and Values.

Purpose and Hypotheses

The primary purpose of the study was to examine the effects of participation in an aerobic dance class on self-concept. A secondary purpose of the study was to examine how changes in self-concept are related to level of physical fitness and degree of body cathexis. The research hypotheses of the study are listed below:

1. Women who have participated in an aerobic dance class will have a significantly greater positive change in self-concept than women who have not participated in an aerobic dance class and women in a placebo treatment group.

2. Initial level of physical fitness will be significantly negatively correlated with positive change in self-concept.

3. Degree of body cathexis will be significantly negatively correlated with positive change in self-concept.

Rationale for Research Hypotheses

Research leading to the finding that participation in physical activities results in positive changes in self-concept is abundant. Collingwood and Willett (1971) found significant increases in body attitude, positive self

attitude, and self acceptance in male teenagers who participated in a three week physical training program. In a study involving male rehabilitation clients, Collingwood (1972) found significant differences between a group involved in a physical training program and a control group on a self-concept scale and a self acceptance scale. Hilyer and Mitchell (1979) examined changes in self-concept in college students participating in a running program and in a running program combined with facilitative counseling. Their results indicated changes in self-concept for students in both groups when compared to students who were not involved in fitness training. The greatest change in self-concept occurred among students who initially had low self-concepts. Joesting and Clance (1979) found significant differences in body-cathexis and self-concept between male runners and nonrunners, with the runners evidencing more positive attitudes on both scales.

Additional studies yielding significant results included White's (1974) demonstration of a direct relationship between improvement in physical fitness measures and improvement in several subscales of the Tennessee Self-Concept Scale for male college students. Henderson (1974) reported significant improvement in self-concept and body-image in a group of female college students participating in a six-week jogging class. In a study comparing groups of male and female college students participating in a 12-week physical conditioning program

with groups receiving instruction in personal hygiene, Jeffers (1977) found significant improvement on the psychological measures of the Body Attitude Scale for both male and female experimental groups in comparison to the control groups.

Ben-Schlomo and Short (1983) reported that improvements in self attitudes can be attributed to variables such as frequency of conditioning, personality characteristics, and initial fitness level in studies demonstrating inconclusive reports. Layman (1974) pointed to the additional variable of the teacher-student interaction as a possible influence on positive psychological changes after physical conditioning programs. She stated the following:

It appears that changes in self-concept, self-cathexis, and self-ideal self discrepancy are most likely to occur as a result of physical education programs designed to meet individual needs, with teachers who serve also in the role of understanding friend and/or psychotherapist (p. 49).

Consistent with this view, Martens (1975) suggested that the instructor of physical exercise programs provides additional impetus for change.

Research has demonstrated that the degree of positive self-concept increases with the degree of satisfaction toward an individual's body characteristics (Lerner et al., 1973). Layman (1974) qualified these research findings when she noted that "improved physical fitness itself would be expected to result in improved self-concept only when

the lack of fitness has been a basis for devaluation of the self" (p. 49). Tucker (1983) provided support for Layman's hypothesis with his finding that males who enter a weight training program with relatively poor body attitudes tend to gain significantly more in self-concept after four months of training than do males who commence with relatively high body satisfaction scores.

Consistent with these studies, there appears to be a general consensus in the literature that individuals with initial low levels of physical and psychological fitness benefit the most from physical conditioning programs (Folkins, Lynch, & Gardner, 1972; Jasnoski & Holmes, 1981; Wifley & Kuncce, 1986). These research findings and the results of a review of the literature on the effects of physical exercise on self-attitudes (Ben-Shlomo & Short, 1983) form the basis of the rationale for the second and third research hypotheses. Ben-Shlomo and Short concluded:

Psychological change occurs with subgroups of individuals who initially demonstrate clinical deviance on a physical or psychological variable; however more studies using non-rehabilitation subjects with initially low physical or mental status would help to substantiate this conclusion (p. 23).

This conclusion was based partly on the findings of Folkins, Lynch, and Gardner (1972), who reported that those subjects in the poorest physical and/or psychological condition before physical fitness programs demonstrated the most improvement in physical fitness and self-attitudes. The prediction that women who initially have lower physical

fitness levels and lower levels of body-cathexis will evidence greater positive changes in self-concept is derived from these research findings.

Limitations of the Study

The scope of the study was limited in a number of ways. The study was restricted geographically to a moderate size university city in the southwest. Therefore, caution must be utilized when generalizing the results to other geographic areas. Due to the increased risk of injury while participating in aerobic dance classes in older women (Thompson & Martin, 1984) the study was limited to women between the ages of 20 and 50. Therefore, the results may not be descriptive of males or individuals outside of this age range. Aerobic dance was the method of treatment in the study. Therefore, care should be exercised in extrapolating the results of the study to other forms of physical conditioning.

Organization of the Study

The remaining chapters in the study are organized as follows. Chapter Two presents an analysis of the literature relating physical activity and self-concept. Chapter Three describes the methods and procedures utilized in the study. It includes a description of the subjects and research instrumentation, a description of the experimental procedures, and an explanation of how the data

was analyzed. The results of the data analyses are presented in Chapter Four. The study concludes with Chapter Five, which provides a summary of the study, a discussion of the data analyses results, implications for future research and counseling practice, and conclusions.

CHAPTER II

REVIEW OF LITERATURE

Introduction

Chapter Two presents an analysis of the literature relating physical activity and self-concept. The first section will present definitions of self-concept and implications for use of this construct in research. The remaining three sections present research on the relationship between self-concept and body cathexis, the effects of physical conditioning, and physical fitness.

The Construct of Self-Concept

Definitions of self-concept are often vague and generally vary from one study to the next. According to Calhoun and Morse (1977):

Self-concept . . . refers to how an individual perceives himself in terms of ability, value, worth, limitations, etc. The self-concept is the substantive description one employs to identify his nature, and is also used by individuals to compare themselves to others (p. 319).

Beane and Lipka (1980) defined self-concept as the "perception(s) one has of oneself in terms of personal attributes and the various roles which are played or

fulfilled by the individual" (p. 2). In a review by Shavelson, Hubner, and Stanton (1976), 17 different conceptual dimensions for the classification of self-concept definitions were identified. They constructed a working definition of self-concept that was consistent with current research and could be used to begin to integrate empirical evidence on the validity of self-concept interpretations. Seven features were identified as critical to the construct definition. Self-concept was described as organized, multifaceted, hierarchical, stable, developmental, evaluative, and differentiable (Shavelson et al., 1976).

First, the organized or structured feature of self-concept concerns the way individuals utilize categories as a way of organizing experiences and giving them meaning. A second feature, the multifaceted aspect of self-concept, refers to the particular facets which reflect the category system adopted by a particular individual including areas such as social acceptance, physical attractiveness, and ability. A third feature of self-concept is that the multifaceted structure of it is hierarchical on a dimension of generality. Facets of self-concept may form a hierarchy from individual experiences in particular situations at the base of the hierarchy to general self-concept at the apex (Shavelson et al., 1976).

A fourth feature of self-concept is that general self-concept is stable. However, when descending the self-concept hierarchy, self-concept depends increasingly on specific situations and thus becomes less stable. A fifth feature of self-concept is its developmental aspect. With increasing age and experience, self-concept becomes increasingly differentiated. The sixth feature of self-concept is its evaluative character. Not only do individuals develop a description of themselves in a particular situation, they also form evaluations of themselves in these situations. A final feature of self-concept is that it is differentiable from the other constructs with which it is theoretically related (Shavelson et al., 1976). Self-concept is influenced by specific experiences. Therefore, the more closely self-concept is linked with specific situations, the closer is the relationship between self-concept and behavior in the situation.

Most self-concept studies examine correlations between a measure of self-concept and measures of other constructs, differences in mean self-concept scores among different populations of students, and changes in self-concept attributable to some treatment (Shavelson et al., 1976). A number of criticisms of self-concept studies have been identified by Wylie (1961a). The imprecision of self-concept definitions makes it extremely difficult to specify: (a) the population of self-concept items from

which a representative sample would be drawn for the instrument, and (b) the population of subjects for which the measurement techniques and interpretations would be appropriate.

A second difficulty in interpreting measures of self-concept arises because data are not readily available on the equivalence of various self-concept measurement instruments (Shavelson et al., 1976). In addition, data are not available to test rival counter-interpretations. The self-concept interpretation may be challenged on the grounds that subjects may: (a) select responses they know to be socially desirable rather than responses that are self-descriptive, or (b) be unable or unwilling to report their "private" self-concepts.

Self-Concept and Body Cathexis

The relationship between body image and self-concept has been extensively studied in the literature. Studies have consistently demonstrated that self-concept and body image are significantly correlated (Secord & Jourard, 1953; Jourard & Secord, 1954; Weinberg, 1960; Zion, 1965). Wylie (1961b) provided an interpretation of these findings:

Theoretically a person's body characteristics as he perceives them might exert a central influence on the development of his self-concept. It seems safe to say that self-concept theorists agree on the general idea that body characteristics which are lowly valued by a subject may be expected to

undermine his general self-regard, while highly valued body characteristics should enhance self-regard (p. 159).

Similarly, Schwab and Harmeling (1968) noted that the feelings people have toward their bodies are central to the concept they have of themselves.

Research on body cathexis was initiated by Secord and Jourard (1953). They developed a Likert type scale to measure body cathexis, which was defined as the degree of feelings of satisfaction or dissatisfaction with the various parts or processes of the body. The scale consisted of 46 body parts and functions. A split-half reliability coefficient of .78 was calculated for 45 college males and .83 for 43 college females. Scores from the Body Cathexis (BC) Scale were then correlated with the Self-Cathexis (SC) Scale for the 88 college subjects. The SC Scale consisted of 55 items believed to represent a sampling of various conceptual aspects of the self. Correlations between total BC scores and total SC scores were .58 for men and .66 for women. The authors concluded that individuals have a moderate tendency to cathect their body to the same degree and in the same direction that they cathect their self. A criticism of the study is the use of a single set of scores derived from the same sample to establish both the split-half reliability of the two scales and the intercorrelations between them. The study utilized a total sample size of only 88, and the use of college students restricts the generalizability of the results.

Jourard and Secord (1954) extended their findings on 60 female college students utilizing the BC Scale, a body-estimate questionnaire, and an ideal-body questionnaire. Significant correlations between measured size of selected aspects of the female body and cathexis for those parts were found. The authors concluded that a shared ideal for certain dimensions of the female figure existed among college women.

In a replication of the Secord and Jourard study, Weinberg (1960) correlated scores on the BC and SC Scales for 108 college men and 104 college women. It was again found that body cathexis and self cathexis were significantly related, but the correlation for males was significantly higher than for females. The study contributed little to the existing research, however, because the same measuring instruments and a similar college population were utilized.

In a study of the same variables, Zion (1965) examined the relationship between self-concept and body concept using the Index of Adjustment and Values and a body concept test he developed. The facets of body concept were measured by five different Guttman scales each for body description, body acceptance, and ideal body. In the Guttman Scale Program, when the items of a scale were arranged in the order of descending popularity and the respondents were ranked according to their replies, it was possible 90 percent of the time to tell by a person's rank

score how he responded to each question (Zion, 1965). The scales were administered to 200 female college students. The results of the study indicated a significant linear relationship between self-concept and body concept. The use of different measuring instruments for self-concept and body concept, as well as the relatively large sample size, contributed significantly to the research demonstrating the correlation between self-concept and body concept.

Rosen and Ross (1968) administered Likert type scales consisting of 24 body parts and 17 adjectives from the Adjective Check List to 82 undergraduate subjects. Subjects were asked to rate how satisfied they were with each body part or adjective and how important that aspect was to them. It was concluded that the relationship between attitudes about the self and about the body are a function of the importance of aspects entering into the measurement. The lack of reliable measuring instruments, evidenced by the limited number of items included, seriously limits the validity of these results.

In a partial replication of the Rosen and Ross study, Lerner et al., (1973) failed to duplicate their results. The study involved 118 male and 190 female undergraduate college students and employed the same Likert type scales of 24 body characteristics. The self-concept scale utilized consisted of 16 bipolar dimensions derived from the Adjective Check List. The authors concluded that the degree of positive self-concept increases with the degree

of satisfaction toward one's body characteristics. When subjects' satisfaction for each body part was linearly weighted by their corresponding rating of the importance of that body part and correlated with the subject's self-concept score, the correlations between satisfaction and self-concept did not increase. Thus, the findings of Rosen and Ross were not supported. It was concluded by Lerner et al. that sex differences in the role of the body in personality development must be considered. The criticism regarding the use of shortened scales without reporting reliability and validity is also applicable to this study.

A study by Mahoney (1974) further supported the Lerner et al. findings. Using the BC Scale and the Rosenberg Self-Esteem Scale on 129 female and 98 male college students, he found no relationship between the subjective importance of body parts and the correlation between body-concept and self esteem. Based on these findings, Mahoney's conclusion that "in terms of how satisfaction with one's body aspects is related to self esteem, the subject's report of the importance of body aspects is clearly irrelevant" (p. 30) appears to be accurate.

Following the establishment of a positive correlation between mean body cathexis and self esteem, Mahoney and Finch (1976) utilized multiple stepwise regression to address the question of the differential contribution of cathexis for specific body aspects to self esteem.

Subjects consisted of 98 male and 129 female college students. The BC Scale and the Rosenberg Self Esteem Scale were the instruments employed. The results indicated that different body aspects contribute to explaining variance in self esteem for males and females. For males, only six body aspects actually accounted for variance in self esteem; for females there were seven significant body aspects.

Goldberg and Folkins (1974) administered the Schwab-Harmeling revision of the body-cathexis scale and the Multiple Affect Adjective Check List to 113 male and 135 female college students. Significant correlations were found between body-image and the three affect scales (Anxiety, Depression, and Hostility). It was concluded that a significant relationship existed between low body image and negative emotional attitudes for both males and females.

In contrast to the findings of Goldberg and Folkins, Schwab and Harmeling (1968) reported striking gender differences in the relationship between body image and psychological well-being. In a study involving medical inpatients, females were significantly more dissatisfied with their bodies than males. The authors found the following:

The females' dissatisfaction with their bodies is correlated with a remarkable different orientation than the males'. The females' bodily feelings were much more closely tied to the conditions of illness and psychological well-

being . . . Thus, for the females, widespread dissatisfaction with the body is part of a pervasive condition characterized by anxiety, self-deprecation, pessimism, inimical attitudes toward medical care, and distortions (p. 58).

When speculating on the reasons for the marked gender differences, it was noted that the cultural emphasis on physical attractiveness in females makes it almost a prerequisite of a woman's self-esteem. The importance of a favorable body image to women's overall feelings of well-being resulted in a preoccupation with the appearance and functions of the body. Medical patients who felt dissatisfaction toward the parts of the body affected by illness experienced negative feelings toward the body as a whole. The result was a devalued body image and a subsequent lowering of general self-esteem.

Snyder and Kivlin (1975) provided additional support for the hypothesis that physically active and healthy women have higher scores on measures of body image and psychological well-being. The authors used self-administered questionnaires to compare measures of psychological well-being (defined as global feelings of contentment, life satisfaction, and happiness) and body image among 275 women college non-athletes and 328 women athletes. Their results demonstrated a positive relationship between athletic involvement and measures of psychological well-being. Women athletes also indicated more positive feelings toward their bodies than non-athletes. Criticisms of the study include no reported

reliability and validity for the instruments measuring the dependent variables and poor sampling procedures.

Summary of Self-Concept and
Body Cathexis

The research findings indicated a positive relationship between body image and self-concept. This relationship appeared to be much more pronounced in females than in males. A possible explanation for the gender differences is our culture's clearly delineated definition of what constitutes an attractive female body. This emphasis on physical attractiveness has resulted in an inextricable link between women's positive self-esteem and their perception of an attractive body. Dohrmann-Rindskopf and Gratch (1982) reported:

The emphasis on appearance in females and the equating of attractiveness with youthfulness do not bode well for the adult woman in our culture. The maintenance of an ideally feminine appearance, with its valuing of smooth, soft, unlined, unmuscled body and face, becomes more and more difficult as the aging process evolves . . . Aging is difficult for both men and women, but it is especially so for women. Throughout life, appearance has been more important for females. Simultaneously, female standards of attractiveness are much more narrowly defined than male standards (p. 19).

The research also demonstrated that the various parts and processes of the body do not contribute equally to the relationship between body image and self-concept. Most of the variance in self-esteem can be accounted for by a small

number of body parts. Mahoney and Finch (1976) reported that for males the body aspect that contributed the most to explaining variance in self-esteem was voice, followed by chest and facial features. For females, overall physical attractiveness accounted for the most variance in self-esteem, followed by voice, calves, height, and hips.

Gender differences between the relationships among physical attractiveness, body attitudes, and self-concept were also studied by Lerner et al. (1973), who found that males and females rate the importance of the various body parts for both their own and opposite-sex physical attractiveness in a similar way. Males considered shape of legs, hips, and thighs more important in determining females' physical attractiveness than in determining their own. Females considered height and width of shoulders more important for judging the physical attractiveness of males' bodies than for their own bodies. The relationship of the various body parts to global body image was clarified by Schwab and Harmeling's (1968) observation that dissatisfaction with certain body parts due to illness resulted in negative responses to many bodily parts and functions. This lack of specificity reflects an extension of negative feelings toward the body as a whole and results in a devalued body image. Lowered perceptions of the body result in emotional distress because of the intricate relationship between body image and self-concept.

In contrast to the lowered body image and self-concept of women who are not physically healthy and attractive, female athletes clearly indicated more positive feelings toward their bodies and subsequent feelings of psychological well-being. From the results of the literature review on body image and self-concept, it is possible to conclude that activities designed to enhance individuals' perceptions of their bodies will contribute to a simultaneous increase in psychological well-being and self-concept. Folkins and Sime (1981) verbalized a similar conclusion when they stated, "Changes in the body as a result of fitness training might reasonably be expected to alter one's body image, which is highly correlated with and might be expected to radiate to self-concept" (p. 380).

Self-Concept and the Effects of Physical Conditioning

Research describing the psychological benefits of improvements in physical fitness has steadily increased in recent years. Blumenthal, Sanders-Williams, Needels, and Wallace (1982) categorized the research into three broad classes of studies. The first class (single group, nonexperimental designs) did not control for extraneous variables such as maturation, selection bias, statistical regression, or test-taking attitude.

The second class of studies compared groups that were assumed to differ in the degree to which they engaged in

physical exercise (for example, fit and unfit individuals, or athletes and non-athletes). A criticism of these studies was a selection factor, such as the possibility of maladjusted individuals not participating in sports or athletics. Therefore, demonstrated differences between groups may not necessarily be a result of exercise. A third class of studies reported positive psychological changes accompanying physical exercise in specialized populations such as children, alcoholics, or psychiatric patients. The results of these studies may not be generalizable to other populations.

This section of the literature review will present studies within the three classes described by Blumenthal et al. It will conclude with research addressing the difficulties in determining a cause-effect relationship between physical conditioning and psychological changes.

In a single group, nonexperimental design, Collingwood (1971) examined the effects of participating in jogging, calisthenic, and swimming exercises upon self-concept and body attitude. Subjects were five male teenagers. A shortened form of the Body-Attitude Scale and Bills Index of Adjustment and Values (IAV) were used to assess body attitude and self-concept. Subjects' ratings on the Body Attitude Scale and three scales of the IAV demonstrated significant increases. In addition to the threats to internal validity in this type of design described above, the small sample size was a major limitation of the study.

An example of studies comparing groups that differ in the degree to which they engage in physical exercise was provided by Snyder and Kivlin (1975), who compared women athletes and non-athletes on measures of psychological well-being and body image. More positive self-attitudes were demonstrated by the athletes. Similarly, a study by Joesting (1981) compared 37 college students who reported five or more hours of weekly physical activity with 29 non-exercisers on measures of body-cathexis and self-cathexis. Joesting concluded that people who participated in regular physical activity have a better view of their bodies and higher self-concept. A major criticism of these studies is the selection factor previously described by Blumenthal et al. (1982).

In one of the few studies utilizing random assignment of subjects to groups, Collingwood (1972) examined changes in self attitudes of 25 matched pairs of male rehabilitation clients. The Body-Attitude Scale and the IAV were again employed. Subjects were randomly assigned to a control group and an experimental group that participated in physical training comprised of jogging, calisthenics, and agility drills for five days a week, for four weeks. The subjects' rehabilitation counselors were also asked to rate their behavioral changes in the classroom. Results indicated significant between groups effects on the Body Attitude Scale, the IAV, and the ratings from subjects' rehabilitation counselors, with the

experimental group displaying greater positive change. The use of randomization and multiple measures of the benefits of the physical training program contribute to the validity of the findings.

Hanson and Nedde (1974) examined the effects of a physical training program on the self-concepts of eight women aged 20-44. Subjects were chosen at random from volunteers. The eight-month training program consisted of a series of warm-up calisthenics and running, walking, or jogging on an indoor track. The Tennessee Self-Concept Scale tests were used to measure self-concept. When comparing pre- and posttraining results, significant alterations of self-concept were observed in six of the seven test areas. Self-satisfaction and self-acceptance increased, perception of physical self improved, sense of personal worth and adequacy increased, adequacy in social interaction improved, and the overall level of self-esteem and self confidence grew. The research by Hanson and Nedde was significant because it was one of the few studies to utilize sedentary females as subjects. However, the small sample size and lack of a control group are major weaknesses of the study and greatly restrict the generalizability of the results.

In an additional study involving 20 women enrolled in an aerobics class, Jarnoski, Holmes, Solomon and Aguiar (1981) examined whether participation in the training program influenced subjects' self-perceptions of their

abilities and their confidence in those abilities. Self-perceived abilities were measured by asking subjects to fill in the blanks in three statements to indicate how many minutes they could walk, run, and study without resting. Subjects indicated their confidence in these abilities by marking a five-point continuum ranging from "completely uncertain" to "completely certain." The results must be interpreted cautiously because no reliability and validity was reported for the instruments utilized in the study. An additional weakness was the lack of random assignment to experimental and control groups. However, the conclusion that subjects who participated in the aerobic training program reported greater improvements in their abilities and confidence than did the waiting list control subjects is consistent with the findings of Hanson and Nedde (1974) and contributes additional support to the hypothesis that physical conditioning positively increases self-concept.

A recent study involving sedentary females was conducted by Ben-Shlomo and Short (1986) to test the hypothesis that physical conditioning improves self-concept and body satisfaction as measured by the Tennessee Self-Concept Scale and the Body-Cathexis Scale. Subjects were 15 female volunteers randomly assigned to arm-training, leg-training, or control groups. The conditioning groups exercised on cycle ergometers for six weeks while the control group refrained from exercise.

Consistent with previous research, results of the study substantiated the hypothesis that psychological gains are most apparent in people who are physically unfit, and suggested that participation in an aerobic conditioning program has psychological benefits for sedentary women.

A number of studies utilized both male and female subjects when examining the effects of physical conditioning on self-concept. Hilyer and Mitchell (1979) examined the effects of a jogging training program on self-concept as measured by the Tennessee Self-Concept Scale. Subjects were 120 college students who were randomly assigned to one of three treatment conditions: control, running only, and running with counseling. The treatments lasted for ten weeks. A significant difference in mean gain scores of self-concept occurred among low self-concept students according to treatment. The most notable changes occurred among low self-concept students in both running groups. The use of randomization and a control group were positive factors when assessing the internal validity of the study.

A questionnaire developed by Jorgenson and Jorgenson (1979) was completed by 454 respondents who ran regularly (an average of 22 miles per week). The authors reported that 92% of the respondents perceived increased emotional well-being as a result of running. Though the validity of the questionnaire in their study is questionable, additional studies lended support to the finding that

improvements in psychological well-being follow physical conditioning. Blumenthal et al. (1982) utilized the Profile of Mood States (POMS) and the State-Trait Anxiety Inventory (STAI) to assess the effects of ten weeks of aerobic exercise on the psychological functioning of 16 healthy middle-aged adults (11 women and 5 men). A matched control group was included in the study. The treatment condition consisted of 10 minutes of stretching followed by 45 minutes of continuous walking or jogging. Posttest comparisons for the experimental and control groups revealed significant differences on the POMS and the STAI, with the experimental group evidencing less Tension, Fatigue, and Depression, more Vigor, and a reduction in trait anxiety. Ewing, Scott, Mendez, and McBride (1984) also utilized the POMS to demonstrate an enhancement of exercising subjects' sense of energy, vigor, optimism, and well-being both during and after an actual period of physical exercise.

A review of the literature by Folkins and Sime (1981) strongly suggested that physical conditioning actually does contribute to changes in self-concept. Improvement in self-concept was reported for elementary age children (Martinke, Cheffers, & Zaichkowsky, 1978; Mauser & Rynolds, 1977), teenagers (McGowan, Jarman, & Pedersen, 1974; Collingwood & Willett, 1971), college students (Hilyer & Mitchell, 1979), and adults (Collingwood, 1972; Hanson & Nedde, 1974). The convincing evidence demonstrated by true

experimental studies led to this conclusion by Folkins and Sime:

It seems that when fitness effects are documented, self-concept does indeed improve. In contrast to other personality dimensions that have been studied, self-concept appears to be affected by physical fitness changes (p. 381).

Summary of Self-Concept and The Effects of Physical Conditioning

The literature review consistently demonstrated that self-concept change and increases in psychological well-being follow physical conditioning activities. The use of randomization and control groups in studies examining the effects of physical training on self-concept substantiated the hypothesis that participation in physical conditioning enhances psychological well-being. Though a majority of the studies utilized adult males as subjects, similar results were obtained using elementary school children, teenagers, college students, and adult females. Hanson and Nedde (1974) supported the generalizability of studies involving male subjects to females when they reported:

The dimensions and functional capabilities of the female oxygen transport system have repeatedly been shown to be smaller than those of males, even well-trained and world-class female athletes demonstrating lower aerobic capacities than men. In general, however, female subjects participating with men in physical training programs have shown comparable absolute or percentage changes in physiologic variables, and results in strictly female training groups are commensurate

with those much more frequently documented in males...there should theoretically be no sexual difference in trainability, and results of (research) confirm this viewpoint (p. 114).

Though research consistently demonstrated a relationship between physical conditioning and self-concept change, the exact manner in which physical fitness is related to psychological fitness remains unspecified. Opposing viewpoints can be identified in the literature. Folkins et al. (1972) stated:

Psychological changes are firmly tied to changes in physical fitness even though a cause-effect relationship is not demonstrated. . . . Perhaps the most plausible explanation for the restorative effect of improved physical fitness on psychological fitness is grounded in the experience of physical well-being. Psychological fitness may result from feedback from musculature, for example, heart and limbs (p. 507-508).

In contrast, Heaps (1978) suggested:

It is a person's feeling or attitude about his physical condition, not his actual fitness, which is related to certain kinds of psychological functioning...the relationship between personality and actual fitness will depend on whether a person's actual and perceived fitness levels are congruent with each other" (p. 403-404).

It is unlikely that a simplistic cause-effect relationship between physical conditioning and improvement in psychological well-being can be established. A more realistic conceptualization was provided by Greist et al., (1981), who formulated the following hypotheses that may each partially account for the beneficial effects of physical conditioning:

1. Mastery - The sense of success and mastery individuals experience after acquiring a difficult skill.
2. Capacity for change - Individuals involved in regular physical conditioning learn that they can change themselves for the better.
3. Generalization - The experience that competency in one area of physical conditioning helps individuals feel capable of becoming competent in other areas.
4. Distraction - The experience of new bodily sensations that distract individuals from stressful stimuli.
5. Positive habit or "addiction" - The substitution of physical conditioning for more negative and neurotic defenses and habits.
6. Symptom relief - Physical conditioning provides a reliable means of reducing symptoms of anger and anxiety as well as depression.
7. Consciousness alteration - The state described by serious athletes as a very positive, creative, less conscious, and more insightful state of mind.
8. Biochemical changes - Examples include the endorphin hypothesis described by Morgan (1985) in which the action of endorphins produced by the brain, pituitary gland, and other tissues can be "morphine-like" in the sense that they have the ability to reduce the sensation of pain and produce a state of euphoria.

An eclectic conceptualization of the complex relationship between physical fitness and psychological well-being provides an explanation for past researchers' ability to demonstrate consistent findings among diverse populations exposed to a variety of physical conditioning treatments.

Self-Concept and Physical Fitness

The relationship between physical fitness and personality traits has been examined extensively in the literature. Tillman (1965) compared 63 junior high and highschool males who were high in physical fitness and 50 males who were not physically fit on the A-S Reaction Study of Allport, Cattell's 16 Personality Factor Questionnaire, and the Kuder Preference Record. Differences were found between the personality traits of the two extreme fitness groups. The physically fit boys exhibited more dominance, were more socially oriented, and were more extroverted than the less fit boys.

In a study of 65 male college students, Sharp and Reilley (1975) correlated measures of physical fitness with selected scales on the MMPI. Results indicated that aerobic fitness was correlated positively with the more favorable scales on the MMPI and negatively with the less favorable scales. Analysis of changes in physical fitness scores and changes in personality scale scores indicated that subjects who initially scored highest on the aerobic

tests also gained the most psychologically, but the least physically. Conversely, subjects who scored the lowest on the aerobic tests gained the least psychologically but the most physically.

Leonardson (1977) found a significant correlation between perceived physical fitness and scores on the Piers-Harris Children's Self-Concept Scale for 165 high school students and scores on an adaptation of the semantic differential for 33 freshman college students. The results of the study are questionable due to a lack of reported reliability and validity for the scales utilized. Additional research by Leonardson and Gargiulo (1978) supported the correlation between perceived physical fitness and self-concept for 33 college freshmen. Self-concept was assessed by a 44-item semantic differential rating scale with a test-retest reliability of .82 and internal consistency of .96. The use of a more reliable measure of self-concept added validity to the conclusions reached in the study.

Following the correlational studies examining the relationship between physical fitness and psychological variables, research shifted to more experimental designs. Folkins, Lynch, and Gardner (1972) investigated changes in personality, mood, and work behavior variables among 75 college students enrolled in a jogging course and 62 students enrolled in archery and golf courses. Physical fitness was measured by the amount of time it took a

subject to run 1.75 miles. A second physical fitness measure was resting heart rate. Psychological variables were measured by the self-confidence and personal adjustment scales of the Adjective Check List, the anxiety and depression scales of the Multiple Affect Adjective Check List, and two 9-point self-rating scales assessing subjects' ability to handle work.

Results of the study demonstrated physical fitness improvements for both men and women in the jogging group, and significant changes in psychological fitness only for the women. In an attempt to explain the observed gender differences, the authors noted that the women were initially in much poorer physical condition. They reached the conclusion that "those who are in the poorest physical and/or psychological condition will show the greatest improvement, both physically and psychologically" (p. 507). Correlational analyses supported their conclusion by demonstrating that the greater the improvement (for women) in time of the 1.75 mile run, the more likely the subject became less depressed, more confident, more personally adjusted, more efficient at work, and experienced more restful sleep. As the resting heart rate decreased (an indication of improved physical fitness), subjects became less anxious. In addition to the use of intact groups, the authors' failure to report reliability and validity are serious threats to the internal validity of the study.

Jasnoski and Holmes (1981) supported the findings of Folkins et al. in a study examining the effects of an aerobic training program on 103 undergraduate women. The study was conducted to determine whether initial levels of aerobic fitness were related to differences in personality. Personality variables were assessed by the 16 Personality Factor Questionnaire, the Self-Rating Depression Scale, and the Type A Personality Survey. Subjects participated in aerobic training sessions for one hour twice weekly for 15 weeks. The sessions consisted of 15 minutes of warm-up stretches, 30 minutes of dancing, running, or jumping rope, and 15 minutes of cool-down. The authors concluded the following: (a) initial levels of fitness were related to greater self-assurance, greater emotional stability, less depression, and less pretentiousness; (b) simply participating in the training program was related to increased self-assurance, increased imagination, increased easy-goingness, decreased inhibitions, and decreased behaviors of the coronary prone personality, and improvements in fitness were related to increased self-assurance, increased liberalness, and decreased tension. The lack of random assignment and a control group are serious limitations of this study.

Wifley and Kunce (1986) also investigated the effects of initial levels of physical fitness and psychological stress on changes in physical fitness, self-concept, and emotional distress following exercise. Subjects were 37

women and 46 men (mean age of 43) enrolled in an individualized exercise program. Subjects participated in three one-hour exercise sessions per week for eight weeks. The analysis of the differential effects of exercise indicated that the benefits of exercise appeared to be strongly related to the initial levels of stress and fitness. Subjects in the low physical fitness and high level of stress subgroup demonstrated significantly more favorable changes in physical self-concept, total stress, and vigor than subjects who were above average physically or reported less stress.

Summary of Self-Concept and Physical Fitness

Research examining the relationship between levels of physical fitness and self-concept change following exposure to physical activity programs has consistently demonstrated that individuals in poor initial physical and/or psychological condition tend to show the most physical and psychological improvement. Subjects who enter exercise programs with average or above average physical fitness levels are not likely to evidence significant improvements in psychological or physical fitness. Morgan (1985) reported a similar conclusion:

It has been uncommon for individuals scoring within the normal ranges on measures of depression or self-esteem to experience significant changes following chronic exercise (p. 94).

The results of studies that clarify the differential effects of physical conditioning on psychological variables have major implications in the area of exercise prescription as a method of treatment and/or prevention of a variety of health disorders, and increasing exercise adherence.

Summary of the Literature Review

The research on the relationship between physical conditioning and its effects on mental health encompassed a variety of treatment conditions and psychological variables. Though running and jogging were the most frequently investigated forms of physical conditioning, the effects of swimming, dancing, weight training, skipping rope, and calisthenics were also examined. Some index of psychological well-being was generally the dependent variable, which was represented by a number of mental health measures including anxiety, depression, self-concept, self-confidence, personal adjustment, mood, work behavior, and social adjustment.

The studies included in the literature review employed cardiovascular models of fitness rather than motor ability and muscle skill or muscle strength models. This emphasis on cardiovascular criteria is justified because cardiovascular efficiency has become the best indicator of level of physical fitness (Folkins and Sime, 1981). Cardiovascular endurance training has become associated

with the term "aerobics" which Martin and Dubbert (1982) defined as follows:

Aerobic (endurance) exercise is used to describe repetitive isorhythmic activities such as brisk walking, jogging, cycling, and swimming involving major muscle groups (e.g., legs) in which energy is derived from metabolic processes using a constant flow of oxygen. For cardiovascular benefit these activities should occur at a minimum intensity of 60% to 65% of maximum heart rate, for a duration of 15 to 30 minutes or more, and at a minimum frequency of three times per week (p. 1005).

Thompson and Martin (1984) reported optimal levels of intensity, duration, and frequency as 65-85% of maximal heart rate for 20 to 30 minutes for 3 to 4 days a week.

Aerobic exercise results in a number of training effects described by Cooper (1968b) including increased strength and efficiency of the lungs, increased total blood volume, improved blood flow and lowered blood pressure, lower resting heart rate, and increased lean muscle tissue. These physiological training effects represent the improvements in physical fitness that have been demonstrated to facilitate psychological well-being. Psychological benefits generalize across a variety of cardiovascular training programs (running, swimming, aerobic dance) because all of these activities contribute to similar training effects.

The review of the literature relating self-concept to body cathexis, the effects of physical conditioning, and physical fitness resulted in the following conclusions:

(a) Body cathexis and self-concept are significantly

correlated, with the relationship being much more pronounced for females than for males; (b) self-concept change and increases in psychological well-being follow physical conditioning activities, though a direct cause-effect relationship has not been established due to a number of viable hypotheses that may each partially account for the beneficial effects of physical conditioning; (c) those who are in the poorest physical and/or psychological condition will show the greatest improvement, both physically and psychologically.

A major criticism of most of the research included in the literature review was the lack of true experimental designs. Most studies were quasi-experimental designs, characterized by no random assignment of subjects to groups because "naturally assembled collectives" were utilized. As Folkins and Sime (1981) pointed out, researchers typically study changes in a group (often self-selected) exposed to a fitness training program as compared with changes in a convenient group that did not have a fitness training experience.

Goldwater and Collis (1985) offered guidelines for improving the experimental designs of future research examining the psychological benefits of physical conditioning programs. First, the control groups should be enrolled in some type of activity program, rather than refrain from all participation, to control for factors such as the emotional benefits of social support or positive

interpersonal interaction. The program involved should appear to be a beneficial exercise program to control for the possibility that subjects might feel better simply because they expect to benefit from the program. Finally, subjects should be randomly assigned to experimental or control groups, rather than choose their own condition as is the case of comparisons between intact groups.

Experimental designs that incorporated the above guidelines would have much more internal validity, thus substantiating the tentative conclusions reached in previous studies. In addition to the necessity of true experimental designs, a number of other implications for future research were revealed by the literature review. Since adult males and undergraduate college students were by far the subject populations most often investigated, additional research in sedentary females older than college students is indicated. The effects of aerobic conditioning programs other than running and jogging warrant further investigation in order to examine differential effects of various exercise regimes. Finally, future research should control for extraneous variables such as age and the amount of physical activity subjects participate in before beginning a routine exercise program. The present study ^{*} was designed to incorporate the implications for further research that emerged through the literature review.

CHAPTER III

METHOD AND PROCEDURES

Introduction

Chapter Three describes the methods and procedures utilized in the study. It has been divided into the following sections: description of the subjects, description of the research instrumentation, methodological considerations, description of the procedures, and treatment of the data.

Description of Subjects

The subjects involved in the study were women aged 20 to 50 who lived in a college community in the southwest. The rationale for the selection of women in this age group was derived from the conclusion of Ben-Schlomo and Short (1983) that females older than the undergraduates typically involved in research had rarely been utilized as subjects. Women over the age of 50 were excluded from the study due to the increasing risk of injury while participating in aerobic dance classes (Thompson & Martin, 1984). The sample consisted of volunteers who were randomly assigned to an experimental group, a placebo group, and a control group. The average age

of the entire sample was 28.32. The average age for each group of subjects was 27.83 for the control group, 31.21 for the placebo group, and 25.62 for the experimental group.

Demographic information was obtained for each subject in order to describe the sample in detail. The ethnic backgrounds of the subjects consisted of one Asian American, six Blacks, 58 Caucasians, and four Hispanics. Forty subjects were single and 29 were married. Descriptions of education level and annual income for the sample are presented in Tables 1 and 2.

Of the initial 212 volunteers who attended the organizational meeting, 69 completed the program. In the control group (N = 68), 36 subjects dropped out prior to completing the pretest measures, due to their desire to immediately begin an exercise program. Of the remaining 32 subjects, nine did not return their posttests, leaving a total N of 23. For the placebo (N = 73) and experimental (N = 71) groups, there was a high rate of attrition during the first two weeks of class due to schedule conflicts and the inability to meet the attendance requirements of the study. Attrition leveled off after two weeks, leaving 27 subjects in the experiment group and 25 in the placebo group. For the experimental group, five additional subjects dropped out during the course of treatment for the following reasons: two subjects moved; one individual broke her toe (outside of the aerobic class); one subject changed jobs, which conflicted with the time classes met; and one subject

TABLE 1
DESCRIPTION OF SAMPLE EDUCATION LEVEL
N = 69

Education Level	Percent of Sample
High school diploma	7
Some college	55
Bachelor's degree	12
Some graduate work	13
Master's degree	7
Doctorate	6

TABLE 2
DESCRIPTION OF SAMPLE INCOME LEVEL
N = 69

Annual Family Income	Percent of Sample
Under \$14,999	29
\$15,000 to \$24,999	14
\$25,000 to \$34,999	10
\$35,000 to \$44,999	13
Over \$45,000	22
Did not indicate	12

developed pain in her knee which rendered her unable to continue exercising. This left a total N for the experiment group of 22. In the placebo group, one subject missed two weeks of classes due to the flu and opted not to return, leaving a total N of 24.

Description of the Research

Instrumentation

Descriptions of the three questionnaires and the method of determining physical fitness used in the study follow.

Personal Data Sheet - The personal data sheet was used to obtain demographic and background information from the subjects (Appendix A). It included the Physical Activity Readiness Questionnaire, which was used to assess subjects' current health and fitness status. The questionnaire was adapted from the screening instrument utilized by the Institute for Aerobic Research in Dallas, Texas (Farrell, Note 1) to identify subjects who may be adversely affected by physical fitness testing or participation in training programs. The questionnaire consists of six yes/no questions that address health conditions that could render a subject at risk. If a subject replied "yes" to any of the questions, a statement from a physician confirming her ability to safely do moderate aerobic exercise was required in order for her to participate in the study.

The Personal Data Sheet also included an Activity Level Questionnaire. This instrument was used to obtain a measure

of the amount of physical activity other than the experimental treatment that subjects participated in each week. Subjects were asked to indicate on a scale ranging from "none" (no regular exercise program or sedentary) to "high" (exercise/active at a continuous heart rate for over 40 minutes, four or more times per week) the amount of time they spent in various physical activities (walking, running, bicycling, etc.) Scores on the questionnaire were calculated by assigning a value of three points for "high" answers, two points for "medium" answers, one point for "low," and zero points for "none." Thus, high scores on the Activity Level Questionnaire indicated greater amounts of physical activity.

Bills' Index of Adjustment and Values, Adult Form (IAV) - The IAV is a Likert type instrument consisting of 49 trait adjectives designed to measure variables of importance to self-concept (Appendix B). Examples of the adjectives include acceptable, charming, logical, successful, and worthy. Subjects give three answers to each item. In Column 1 subjects complete the sentence, "I am a (an) _____ person" and indicate how much of the time this sentence is like them on a five-point scale ranging from "most of the time" to "seldom." In Column 2 subjects are asked, "How do you feel about being this way?" and indicate their response on a five-point scale from "I like very much being as I am in this respect" to "I very much dislike being as I am in this respect." In Column 3 subjects are asked, "How much of the time would you like this trait to be characteristic of you?"

Answers are marked on a five-point scale from "most of the time" to "seldom."

The instrument is designed to measure self-concept, self-acceptance, and concept of ideal self. Self-concept was defined by Bills as the information individuals have relative to their present self-organization and as the traits and values which individuals have accepted as definitions of themselves. Self-acceptance was defined as individuals' feelings that certain traits are desirable. The concept of ideal self was defined as individuals' views of themselves as they wish to be (Bills, Vance, & McLean, 1951).

Split-half methods were used to establish the reliability of the instrument. The index was given to 237 students at the University of Kentucky. When the acceptance of self scores for each subject on the odd-numbered items were correlated with the acceptance of self scores on the even-numbered items a coefficient of .91 was obtained (Bills, Vance, & McLean, 1951). The Spearman-Brown formula was used to correct for the full length of the scale. The index was re-administered to 175 of the 237 subjects six weeks after the first testing. The test-retest reliability of the acceptance of self scores for this group was .83.

Concurrent validity is the extent to which measures derived from an instrument are related to the status of people or to the concurrent performances. For the IAV to be valid, it must be shown that its separate measures are not measures of the same thing. If the scores are highly

correlated, it is assumed that they are measures of the same variables and therefore not valid measures of others. When calculating intercorrelations of scores on the separate scales of the IAV, Bills (1975) demonstrated that the Adult IAV scales were not highly intercorrelated and could be judged to be significantly different from each other.

As additional evidence for concurrent validity, Bills (1975) reported the results of a study in which three groups of students completed the "Self" form of the Adult IAV and were tested with the Phillips Attitudes toward Self and Others Questionnaire, the California Test of Personality, and the Washburne S-A Inventory. Correlation coefficients demonstrated statistically significant relationships between the acceptance of self measure of the Adult IAV and both the Phillips self score and the total score on the California Test of Personality.

Construct validity is the ability of a psychological instrument to assess a psychological construct accurately. Bills (1975) reported the results of a study examining the validity of the self ratings given on the Adult IAV as measures of the emotionality of the IAV traits for his subjects. Fifty female sophomore and freshman college students were used as the subjects. It was concluded that self-ratings on the Adult IAV were valid indices of emotionality. Another study was undertaken to determine whether changes in ratings on the IAV from test to retest were paralleled by changes in the emotionality of the

traits for the subjects. Test-retest data showed that changes in trait ratings from test to retest were accompanied by changes in the emotionality of the traits for the subjects and that ratings on the IAV were valid measures of changes in emotionality.

Evidence for convergent validity was provided by Wylie (1974) and indicated significant correlations ranging from .25 to .71 with many different measures of self-regard. Additional evidence of construct validity was indicated by her conclusion that any one of the three self-regard scores of the IAV correlated moderately with a wide variety of verbal self-report instruments which also purport to measure self-regard. The size of the correlations did not seem to depend on similarity of format between instruments.

The Body-Cathexis Scale (BC Scale) - The BC Scale is a Likert type instrument consisting of a list of 46 body parts and functions (Appendix C). Subjects rate their feelings about each listed body part or function using a five-point scale from "strong positive" to "strong negative." The BC Scale measures body cathexis, which is defined as the degree of feeling of satisfaction or dissatisfaction with various parts or processes of the body (Secord and Jourard, 1953).

Corrected split-half reliability coefficients for the 46-item BC Scale are reported by Secord and Jourard (1953) as .78 for 70 college males and .83 for 56 college females. Weinberg (1960) reported coefficients of .84 for 108 college males and .75 for 104 college females on the 40-item scale.

Items on the BC Scale such as back, chin, ankles, legs, chest have obvious face validity. Construct validity was indicated through correlations with a number of other variables. Wylie (1974) reported significant correlations in studies comparing the BC Scale with Maslow's Security-Insecurity Inventory, Self Cathexis, Subject's Perception of How His Parents Perceive His Body and Self, and Bodily Concern. Caution should be exercised regarding the convergent and discriminant validity of the BC Scale because these types of validity have not been adequately explored.

Level of physical fitness was assessed using the Cooper Twelve Minute Run-Walk Test. The run-walk test was developed by Cooper (1970) as a method of self-evaluation of circulo-respiratory fitness. It was selected as the method of assessing level of physical fitness because "cardiovascular efficiency has become the best indicator of level of physical fitness" (Folkins & Sime, 1981, p. 375). Additional support for the validity of this measure was provided by Heaps (1978), who reported that it enabled individuals who were either high or low in actual fitness to become physically exhausted in a brief period of time, and it provided a good estimate of actual fitness or maximum oxygen intake capacity. The test consists of running, or running and walking as far as possible in 12 minutes. The route is measured by running around a standard length track. The distance covered (measured in miles and fractions thereof) is used as the measure of physical fitness. The distance

covered is interpreted by comparing it to five fitness levels established by Cooper ranging from "very poor" to "excellent." For the purpose of statistical analysis, the distance covered was measured to the nearest 100 meters to obtain data on an interval level scale. Cooper (1968a) noted that the results of the run-walk test correlated .89 with the laboratory treadmill test of aerobic capacity.

Description of the Procedures

The subjects for the study were obtained through advertising in a college newspaper, a daily city newspaper, and notices within departmental offices in a large university. An organizational meeting was held one week prior to the beginning of the aerobic classes. Volunteers were provided with packets consisting of an Informed Consent (Appendix D), the Personal Data Sheet, the Body Cathexis Scale, and the IAV. The written instruments were completed and returned at the meeting.

The informed consent was explained in detail. Volunteers were informed of the nature of the study, the instruments utilized, the qualifications of the instructors and the researcher, and how the results would be utilized. Participants were also assured that they could drop out of the experiment at any time. They were provided with information on how to contact another certified aerobics instructor if they had any questions before, during, or after the study. Confidentiality on all psychological and physical

measures was protected. Subjects were also told how they could obtain a summary of the results of the study after the data analysis.

Experimental (N = 71), placebo (N = 73), and control groups (N = 32) were selected at random from the volunteers. To reduce attrition, subjects who had volunteered with friends were randomly assigned as clusters to assure that they would be in the same group. The control group was placed on a waiting list and informed that they could participate in the aerobic dance class following the initial eight-week session. Subjects had been informed of the possibility of assignment to a waiting-list control group during telephone contact when they initially signed up for the study. However, 36 subjects who obviously wanted to begin an exercise program right away dropped out of the study immediately after being assigned to the control group. Though this created an initial large discrepancy in sample size among the groups, the greater N's for the treatment groups were not adjusted due to the expectation that attrition would be a factor in a study requiring an eight week commitment to an exercise program. This expectation was based in part on the report of Martin, et al. (1984) that, even among those in structured exercise programs, roughly half of the participants will have dropped out by 3 to 6 months.

Due to inclement weather the week prior to the beginning of the aerobic classes, the Cooper Twelve Minute Run-Walk

Test was administered the weekend following the first week of classes. Though the test had originally been scheduled prior to the beginning of the exercise classes, it has been suggested in the literature that some conditioning should occur before field tests are administered. When discussing the use of run-walk tests as a measure of cardiovascular fitness, Pollock, Wilmore, and Fox (1984) noted that "best results are found when participants have had preliminary training. This allows time for some adaptation to training and practice in pacing oneself" (p. 182). Several group administrations of the test were completed to insure accurate measurement of performance. The test was conducted on the university's 400 meter outdoor track.

Experimental subjects participated in one-hour aerobic classes on Monday, Tuesday, and Thursday evenings for eight weeks. During the fourth week, the classes did not meet on Monday due to a scheduling conflict in the building where classes were held. Sessions were structured as follows: 10 minutes of stretching and warm-up; 25 to 30 minutes of aerobic conditioning where subjects worked out at 70-85% of their maximal attainable heart rate; 15 minutes of toning; 10 minutes of stretching and cool down.

Participants were instructed on correct techniques for taking their pulse rates. A pulse rate was taken after 10 minutes of the aerobic part of the class to monitor the heart rate at which maximal aerobic benefits are achieved. Subjects were provided with handouts of a graph containing

bandwidth borders around recommended training heart rates to reference their appropriate "target zone." A recovery heart rate was obtained through a pulse check at the conclusion of the cool down. Demonstrations of correct body mechanics while exercising were provided.

The placebo group was utilized to determine if differences in self-concept change occurred between subjects who experienced cardiovascular improvement (the experimental group) and subjects who experienced a "treatment condition," without the accompanying cardiovascular benefits (the placebo group). Subjects in this group also participated in classes on Monday, Tuesday, and Thursday evenings, lasting for one hour, for eight weeks. Sessions for the placebo group were structured as follows: 15 minutes of stretching and warm-up; 25 minutes of low level aerobic dance that did not meet the minimal requirements of intensity and duration for obtaining cardiovascular conditioning; 20 minutes of stretching and cool-down. Demonstrations of correct body mechanics were also provided.

At the conclusion of the eight-week session, the experimental, placebo, and control groups completed the IAV and the Cooper 12-Minute Run-Walk Test again. Members of the control group were then provided with the opportunity to participate in the aerobic dance classes for the next eight-week session.

Methodological Considerations

Experimenter Bias

Experimenter bias concerns the expectancies that experimenters have of how their subjects will respond.

Rosenthal (1976) stated that:

The particular expectation a scientist has of how his experiment will turn out is variable . . . but the presence of some expectation is virtually a constant in science (p. 127).

It was further noted that such expectations often influence the choice of an experimental design in a way that increases the likelihood that the experimenter's hypotheses are supported.

The investigator served as the instructor for the placebo exercise class in the present study. Though the potential for experimenter bias was increased, the advantages were determined to outweigh the disadvantages. The exercise classes were scheduled for two consecutive hours on the same nights to match the treatment environments as closely as possible. It would be difficult for one instructor to maintain consistent levels of energy and enthusiasm for two consecutive hours of aerobics. It was also unlikely that a single instructor could maintain the commitment required by two hours of aerobics, three nights a week, for eight weeks. The physical demands of such a task would greatly increase the potential for injury that accompanies fatigue.

It was essential to the safety of the subjects that the instructors for the aerobics classes were properly trained and highly competent. The investigator had six years of training and experience as an aerobics instructor. Another instructor was located who closely resembled the instructor in size, attractiveness (i.e. a trim, neat, well-groomed appearance), voice quality and movement style. Based on the investigator's experience as an aerobics instructor, these are salient instructor qualities, so matching on these variables helped minimize the effects of differences in experimenters. Therefore, the possibility of instructors who were not properly trained in the treatment procedures was eliminated. An additional instructor with the necessary level of expertise and the willingness to commit to an eight-week study could not be located. A teacher who was not highly competent in performing the required procedures of the study would possibly have created an additional source of error.

Rosenthal (1976) described "blind" contact, in which the experimenter is unaware of subjects' treatment condition and therefore cannot unintentionally treat subjects differentially as a function of their group membership. However, the difficulty of implementing and maintaining the required experimenter "blindness" was emphasized. Though the current study could not employ true "blind" procedures, the instructor of the experimental group was kept unaware of the purpose of the study and the differences between the two

groups to assist in neutralizing experimenter bias.

Rosenthal (1976) also recommended minimized contact and experimenter constancy as ways of reducing experimenter bias. The placebo and experimental exercise classes were highly structured to maintain constancy, and the experimenters' contact with subjects was limited strictly to their capacity as aerobics instructors. The purpose of these procedures was to minimize experimenter bias as much as possible.

Use of a Placebo Group

The design of the present study utilized both a waiting-list control group and a placebo treatment group. As pointed out by Goldwater and Collis (1985) there are numerous aspects of a training program (i.e. people's expectations of the psychological benefits of training, their social component, the effects of repeated measurement or the passage of time) that may actually be responsible for the program's "effects." To control for these extraneous variables, the authors suggested the following:

A control group should be enrolled in some type of activity program, rather than be totally nonparticipatory, to control for such factors as emotional benefits accruing from social support or positive interpersonal interaction . . . the program involved should ideally have the appearance of a beneficial exercise program to control for the possibility that subjects might feel better simply because of their expectations of the benefits of conditioning programs (p. 175).

The present study attempted to incorporate these suggestions through the use of a placebo group that appeared similar to the actual aerobics classes. The primary

difference between the classes was the failure of the placebo group to perform exercises at the intensity and duration required to exert a significant cardiovascular training effect. Stretching, toning, and relaxation were emphasized as alternatives to high level aerobic workouts. The main purpose of utilizing a placebo group was to control for the factors described above. A secondary purpose of this experimental design was to examine if cardiovascular improvement was necessarily the variable that causes positive psychological change.

Treatment of the Data

A mixed between-within MANOVA was used to test for differences from the pretest to posttest of the three scales of the IAV between the experimental, placebo, and control subjects. This analysis tested the first research hypothesis:

H1: Women who have participated in an aerobic dance class will have a significantly greater positive change in self-concept than women who have not participated in an aerobic dance class and women in a placebo treatment group.

Following the results of the MANOVA, Pearson product-moment correlations were employed to test the remaining two research hypotheses:

H2: Level of physical fitness will be significantly

negatively correlated with positive change in self-concept.

H3: Degree of body cathexis will be significantly negatively correlated with positive change in self-concept.

If the Pearson correlations revealed a significant relationship between the predictor variables and the dependent variable, hierarchical multiple regression would be utilized to assess the amount of variance in self-concept change explained by physical fitness level, body cathexis, the treatment conditions, pretest scores on the dependent variable, and the significant predictors in combination. If subjects' age and level of physical activity were found to be correlated with self-concept change, they would be included in the analysis as control variables. The level of confidence was established at .05.

CHAPTER IV

RESULTS

Introduction

Chapter Four will present the results of the data analyses. Statistical procedures from Statistical Package for the Social Sciences - Revised (SPSSX), 1986 edition were used to analyze the data. The first section will address the primary research question: How does participation in an aerobic dance class affect self-concept? The remaining sections present results of the analysis pertaining to the secondary research questions: (a) Is there a significant relationship between level of physical fitness and change in self-concept? (b) Is there a significant relationship between degree of body cathexis and change in self-concept?

Effects of Treatment on Self-Concept

Random assignment of subjects to groups was utilized to ensure initial equivalency of groups on the dependent variable. One-way between-subjects analysis of variance (ANOVA) was employed to test the equality of the control, placebo, and experimental groups on the pretest measures of

the three dependent variables (Self-Concept, Acceptance of Self, and Concept of Ideal Self). Table 3 lists the means and standard deviations according to group for pre- and posttest scores on Self-Concept. Results of the analysis of variance indicated no significant differences on pretest scores among groups, $F(2,66) = 1.75, p > .05$ (see Table 4).

Table 5 presents the pre- and post-treatment means and standard deviations for each group on Acceptance of Self. The analysis of variance revealed no significant differences on pretest scores between groups, $F(2,66) = 1.09, p > .05$ (see Table 6). Pre- and posttest means and standard deviations on Concept of Ideal Self are listed in Table 7. Results of the analysis of variance (see Table 8) also indicated no significant differences on pretest scores between groups, $F(2,66) = .028, p > .05$.

Analysis of covariance was not indicated for subsequent analyses since a major purpose for using this type of analysis is to adjust for initial group differences (Huck, Cormier, & Bounds, 1974). Therefore, a 3 x 2 mixed between-within multivariate analysis of variance (MANOVA) was performed on the dependent variables. The between-subjects variable was group (control, placebo, and experimental), and the within-subjects factor was trial (pretest and posttest conditions).

SPSSX MANOVA was used for the analyses with the hierarchical (default) adjustment for nonorthogonality

TABLE 3
MEANS AND STANDARD DEVIATIONS
FOR SELF-CONCEPT

Condition	Pretest			Posttest	
	N	M	SD	M	SD
Control	23	195.09	17.45	194.96	13.40
Placebo	24	200.96	15.55	202.67	14.10
Experimental	22	191.14	20.71	200.68	21.51

TABLE 4
ANALYSIS OF VARIANCE TABLE - COMPARISON
BETWEEN GROUPS ON SELF-CONCEPT

Source	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
Main Effects Group	1128.45	2	564.22	0.18
Error	21265.38	66	322.20	
Total	22393.83	68		

TABLE 5
MEANS AND STANDARD DEVIATIONS
FOR ACCEPTANCE OF SELF

Condition	Pretest			Posttest	
	N	M	SD	M	SD
Control	23	184.52	23.58	185.35	22.13
Placebo	24	189.04	17.80	197.79	19.92
Experimental	22	178.96	27.54	194.18	28.10

TABLE 6
ANALYSIS OF VARIANCE TABLE - COMPARISON
BETWEEN GROUPS ON ACCEPTANCE OF SELF

Source	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
Main Effects Group	1169.33	2	584.67	0.34
Error	35451.65	66	537.15	
Total	36620.99	68		

TABLE 7
MEANS AND STANDARD DEVIATIONS
FOR CONCEPT OF IDEAL SELF

Condition	Pretest			Posttest	
	N	M	SD	M	SD
Control	23	223.39	15.19	222.04	10.97
Placebo	24	224.25	10.90	222.92	14.43
Experimental	22	223.54	13.15	226.64	11.31

TABLE 8
ANALYSIS OF VARIANCE TABLE - COMPARISON
BETWEEN GROUPS ON CONCEPT OF
IDEAL SELF

Source	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
Main Effects Group	9.87	2	4.94	0.97
Error	11437.43	66	173.29	
Total	11447.30	68		

(SPSSX User's Guide, 1986). With the use of Wilks' criterion, the combined dependent variables were significantly affected by both trial, $F(3,64) = 7.16$, $p < .001$, and the group by trial interaction, $F(6,128) = 2.31$, $p < .05$, but not by group, $F(6,128) = .57$, $p > .05$.

An examination of the group means for Concept of Ideal Self (see Table 7) revealed that the posttest scores were not significantly affected in any of the groups. A second multivariate analysis of variance was run with Concept of Ideal Self removed, leaving Self-Concept and Acceptance of Self as the dependent variables. With the use of Wilks' criterion, the combined dependent variables were significantly affected by both trial, $F(2,65) = 10.01$, $p < .001$, and the group by trial interaction, $F(4,130) = 3.27$, $p < .05$, but not by group, $F(4,130) = .60$, $p > .05$. Posttest scores on the dependent measures were affected by pretest scores, and this effect varied across groups. However, posttest scores were not significantly different between groups.

Following the significant results of the multivariate analysis of variance, univariate analyses of variance were used for interpreting effects on the individual dependent variables (Kerr, Note 2). Tabachnick and Fidell (1983) caution that, when dependent variables are correlated, reporting them both as significant "mistakenly suggests that the IV is affecting two different behaviors" (p. 253). A further problem with reporting univariate F's described

by the authors is that of inflation of Type I error rate. However, Cooley and Lohmes (1971) recommended reporting univariate F's as an aid in assessing dependent variables following a significant multivariate F. The present study incorporated the suggestion of Tabachnick and Fidell (1983) that the use of univariate F's should be accompanied by a table of pooled within group correlations among dependent variables. Table 9 presents correlations among the dependent variables in the present study.

TABLE 9
POOLED WITHIN-GROUP CORRELATIONS AMONG
DEPENDENT VARIABLES

	Self Concept	Acceptance of Self	Concept of Ideal Self
Self Concept	23.11		
Acceptance of Self	.88	31.21	
Concept of Ideal Self	.41	.31	17.02

Analyses were conducted using univariate analysis of variance with alpha set at .01 to control for correlations between the dependent variables and to protect against Type I errors (Wade & Baker, 1977). After comparing the group means on Self-Concept for the placebo (mean = 202.67) and experimental (mean = 200.68) groups, a one-way repeated measures analysis of variance was conducted to examine

differences on Self-Concept between the control group and the treatment groups combined (Kerr, Note 2). Group means and standard deviations for this comparison are presented in Table 10. The analysis of variance results indicate no significant effect for trial, $F(1,67) = 3.17, p > .01$, or the group by trial interaction, $F(1,67) = 3.49, p > .01$ (see Table 11). Change from pretest to posttest on Self-Concept was not significant for any of the the groups.

A one-way repeated measures analysis of variance was conducted to examine differences on Acceptance of Self between the control group and the two treatment groups combined. Group means and standard deviations for this comparison are presented in Table 12. The analysis of variance results indicated significant effects for trial, $F(1,67) = 10.46, p < .01$, and for the group by trial interaction, $F(1,67) = 7.91, p < .01$ (see Table 13). Posttest scores on Acceptance of Self (mean = 196.06) increased significantly over pretest scores (mean = 184.22) for the placebo and experimental groups combined, but not for the control group (pretest mean = 184.52 and posttest mean = 185.35).

A final one-way repeated measures analysis of variance was conducted to determine if increases on Acceptance of Self were significantly different between the experimental and placebo groups. Pre- and post-treatment means for each group are presented in Table 14. The analysis of variance results

TABLE 10
MEANS AND STANDARD DEVIATIONS FOR
SELF-CONCEPT - TREATMENT
GROUPS COMBINED

Condition	Pretest			Posttest	
	N	M	SD	M	SD
Control	23	195.09	17.45	194.96	13.40
Placebo and Experimental	46	196.26	18.66	201.72	17.84

TABLE 11
REPEATED MEASURES ANALYSIS OF VARIANCE
TABLE - COMPARISON OF CONTROL AND
TREATMENT GROUPS ON INCREASES
IN SELF-CONCEPT

Source	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
Within Cells	4593.01	67	68.55	
Trial	217.48	1	217.48	3.17
Group by Trial	239.31	1	239.31	3.49

TABLE 12
MEANS AND STANDARD DEVIATIONS FOR
ACCEPTANCE OF SELF - TREATMENT
GROUPS COMBINED

Condition	Pretest			Posttest	
	N	M	SD	M	SD
Control	23	184.52	23.58	185.35	22.13
Placebo and Experimental	46	184.22	23.28	196.06	23.97

TABLE 13
REPEATED MEASURES ANALYSIS OF VARIANCE
TABLE - COMPARISON OF CONTROL AND
TREATMENT GROUPS ON INCREASES
IN ACCEPTANCE OF SELF

Source	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
Within Cells	7886.62	67	117.71	
Trial	1231.48	1	1231.48	10.46*
Group by Trial	931.34	1	931.34	7.91*

* $p < .01$

indicated a significant effect for trial, $F(1,44) = 23.18$, $p < .001$, but not for the group by trial interaction; $F(1,44) = 1.69$, $p > .01$ (see Table 15). Posttest scores on Acceptance of Self increased significantly over pretest scores in both the placebo and experimental groups (see Figure 1). The groups did not differ significantly in the amount of gain.

Results Related to Hypothesis 1

The first research hypothesis was that women who have participated in an aerobic dance class would have significantly greater positive change in self-concept than women who have not participated in an aerobic dance class and

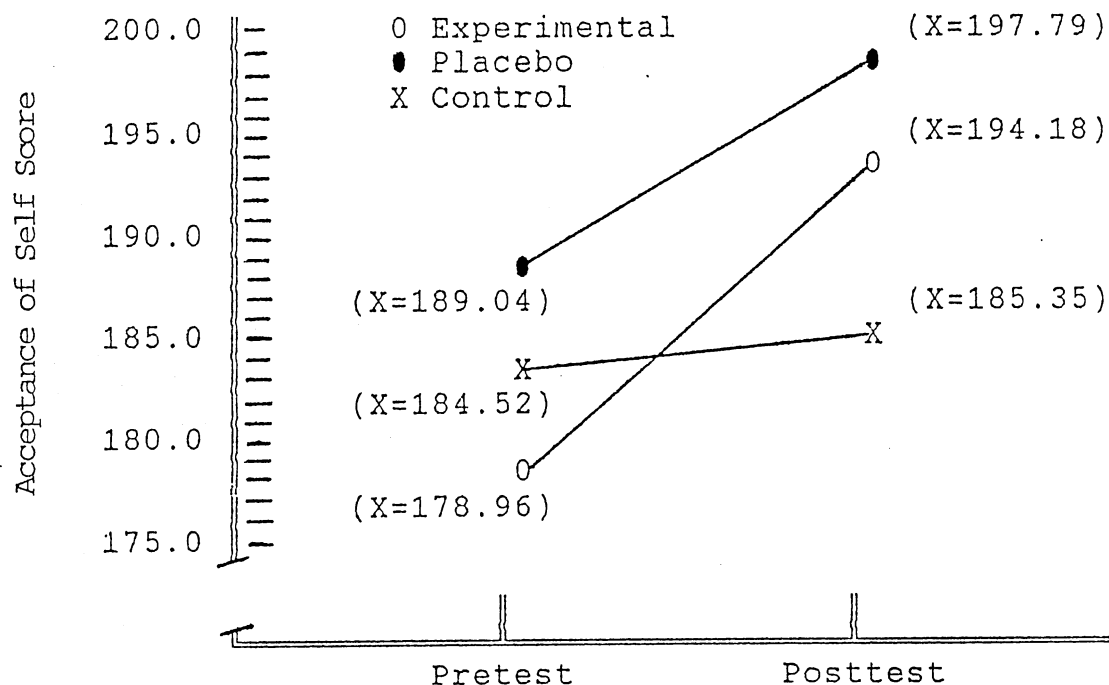


Figure 1. Pretest to Posttest Change on Acceptance of Self

TABLE 14
MEANS AND STANDARD DEVIATIONS FOR
ACCEPTANCE OF SELF - COMPARISON
OF PLACEBO AND EXPERIMENTAL
GROUPS

Condition	Pretest			Posttest	
	N	M	SD	M	SD
Placebo	24	189.04	17.80	197.79	19.92
Experimental	22	178.96	27.54	194.18	28.10

TABLE 15
REPEATED MEASURES ANALYSIS OF VARIANCE
TABLE - COMPARISON OF EXPERIMENTAL
AND PLACEBO GROUPS ON INCREASES
IN ACCEPTANCE OF SELF

Source	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
Within Cells	6264.18	44	142.37	
Trial	3299.48	1	3299.48	23.18*
Group by Trial	240.79	1	240.79	1.69

* $p < .001$

women in a placebo treatment group. Results of the data analysis partially supported the first hypothesis. Women in the aerobic dance class differed significantly from women in the no-treatment control group on positive change in self-concept. However, women in the placebo treatment group also differed significantly from the no-treatment controls on positive change in self-concept. The experimental and placebo groups did not differ significantly from each other in the amount of gain. A positive change in self-concept was significant for the experimental and placebo groups only on the Acceptance of Self scale of the IAV, and not for Self-Concept and Concept of Ideal Self.

Relationship of Body Cathexis and
Physical Fitness to Self-
Concept Change

One-way between-subjects analysis of variance was used to test the equality of the control, placebo, and experimental groups on body cathexis and physical fitness. Table 16 lists the means and standard deviations on the Body Cathexis Scale for each group. Results of the analysis of variance, $F(2,66) = 1.45$, $p > .05$ (see Table 17) revealed no significant differences between groups on body cathexis.

Table 18 presents the means and standard deviations on pre- and posttest measures of the Cooper Twelve Minute Run-Walk Test. Results of the analysis of variance, $F(2,66) =$

TABLE 16
MEANS AND STANDARD DEVIATIONS
FOR BODY CATHEXIS

Condition	N	M	SD
Control	23	151.87	25.73
Placebo	24	161.58	18.36
Experimental	22	160.41	18.51

TABLE 17
ANALYSIS OF VARIANCE TABLE - COMPARISON
BETWEEN GROUPS ON BODY CATHEXIS

Source	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
Main Effects Group	1300.18	2	650.09	1.45
Error	29509.76	66	447.12	
Total	30809.94	68		

TABLE 18
MEANS AND STANDARD DEVIATIONS FOR
THE COOPER RUN-WALK TEST

Condition	Pretest			Posttest	
	N	M	SD	M	SD
Control	23	17.83	2.21	18.17	2.59
Placebo	24	17.08	2.52	18.50	3.09
Experimental	22	16.41	2.79	19.23	2.22

TABLE 19
ANALYSIS OF VARIANCE TABLE - COMPARISON
BETWEEN GROUPS ON THE COOPER
RUN-WALK PRETEST

Source	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
Main Effects Group	22.62	2	11.31	1.79
Error	416.46	66	6.31	
Total	439.07	68		

1.79, $p > .05$ (see Table 19) indicated no significant differences between groups on the pretest. A one-way analysis of variance was employed to examine if changes in physical fitness (indicated by the difference between pretest and posttest scores on the run-walk test) differed among groups. The results indicated significant differences between groups, $F(2,66) = 13.84$, $p < .05$ (see Table 20). Post hoc comparisons using the Scheffe procedure revealed that the experimental group (mean change = 2.82) achieved significantly greater increases on the run-walk test than both the placebo group (mean change = 1.42) and the control group (mean change = .35). The placebo and control groups did not differ significantly from one another. The results indicate that women participating in the aerobic dance class exhibited significantly greater improvements in physical fitness than both women in the placebo exercise class and women on the waiting list.

Pearson product-moment correlations were used to assess the bivariate associations between the continuous control variables (age, activity level, pretest scores on Acceptance of Self), the predictor variables (physical fitness and body cathexis), and self-concept change (indicated by pretest to posttest differences on Acceptance of Self). These correlations are presented in Table 21.

The results indicated a significant relationship with self-concept change only for pretest scores on Acceptance of Self ($r = -.31$, $p < .05$). The relationship suggests that as

TABLE 20
ANALYSIS OF VARIANCE TABLE - COMPARISON
BETWEEN GROUPS ON INCREASES IN
THE COOPER RUN-WALK TEST

Source	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
Main Effects Group	68.92	2	34.46	13.84*
Error	164.32	66	2.49	
Total	233.25	68		

* $p < .001$

TABLE 21
PEARSON PRODUCT-MOMENT CORRELATIONS
WITH CHANGE IN SELF-CONCEPT

Variable	Correlation with Change in Self-Concept
Age	-.09
Activity Level	.03
Pretest Acceptance of Self	-.31*
Physical Fitness	-.22
Body Cathexis	.01

* $p < .05$

pretest Acceptance of Self scores decrease, self-concept change increases. No significant correlations were found between self-concept change and activity level, age, physical fitness, and body cathexis. It was determined that the hypothesized predictor variables were not significantly related to self-concept change. However, the correlation between physical fitness and self-concept change ($r = -.224$, $p = .06$) approached significance in the hypothesized direction.

Results Related to Hypothesis 2

The second research hypothesis stated that initial level of physical fitness would be significantly negatively correlated with positive change in self-concept. Results of the analysis revealed that there was not a significant relationship between physical fitness and change in self-concept, though a trend in the hypothesized direction was noted. Therefore, Hypothesis 2 was not supported.

Results Related to Hypothesis 3

The third research hypothesis stated that degree of body cathexis would be significantly negatively correlated with positive change in self-concept. The data analysis indicated that there was not a significant relationship between degree of body cathexis and change in self-concept. Therefore, Hypothesis 3 was not supported.

CHAPTER V

DISCUSSION

Introduction

Chapter Five presents a summary of the study, a discussion of the results relative to the research hypotheses, implications for future research and counseling practice, and conclusions.

Summary

The present experiment was designed to further investigate the relationship between physical conditioning and psychological change. The primary purpose of the study was to examine the effects of participation in an aerobic dance class on self-concept. A secondary purpose was to examine how change in self-concept is related to level of physical fitness and degree of body cathexis.

Subjects consisted of 69 women aged 20 to 50. Participants completed a Personal Data Sheet, the Body Cathexis Scale, Bills Index of Adjustment and Values, Adult Form (IAV), and the Cooper Twelve Minute Run-Walk Test. They were then randomly assigned to an experimental,

placebo, or control group. The experimental and placebo groups participated in exercise classes lasting one hour, three nights per week, for eight weeks.

Classes were structured to include stretching and warm-up, either aerobic conditioning (the experimental group) or exercise at a level below the minimum requirement for cardiovascular improvement (the placebo group), toning, and stretching and cool-down. At the completion of the eight-week period, all subjects were posttested on the IAV and the Cooper Twelve Minute Run-Walk. Subjects in the control group then participated in the aerobics classes.

A 3 x 2 mixed between-within multivariate analysis of variance was employed to test the hypothesis that women in the aerobic dance class would evidence the greatest positive change in self-concept. The dependent variables were posttest scores on the Self-Concept, Acceptance of Self, and Concept of Ideal Self scales of the IAV. Results of the omnibus F test revealed significant effects for trial (the pre- and posttesting condition) and for the group by trial interaction. Specifically, posttest scores on Acceptance of Self increased significantly over pretest scores for both the experimental and placebo groups, but not for the control group. The experimental and placebo groups did not differ significantly in the amount of change. Posttest scores did not differ significantly from pretest scores on Self-Concept or Concept of Ideal Self for any of the groups.

Analyses of pre- to posttest differences on the run-walk test revealed significant differences between groups. Post hoc comparisons indicated that the experimental group achieved significantly greater increases on the run-walk test (indicating improved physical fitness) than both the placebo and control groups.

Pearson product-moment correlation coefficients were utilized to test the hypotheses that physical fitness and body cathexis would be significantly negatively correlated with change in self-concept. The correlations between self-concept change and body cathexis and physical fitness revealed that there was no significant relationship between the independent variables and the dependent variable. It was determined that body cathexis and physical fitness were not significantly related to self-concept change.

Discussion of the Research Hypotheses

Hypothesis 1

In order to determine if the treatment conditions had an effect on increases in self-concept, a combination of both the experimental and placebo groups was compared against the no-treatment control group on the dependent variables Self-Concept and Acceptance of Self. Both the placebo and the experimental groups evidenced significantly greater gains than the control group on Acceptance of Self, but not on Self-Concept. The two treatment groups did not

differ significantly from one another in the amount of gain.

In attempting to account for the differential effects of treatment on the dependent variables, it is important to consider what each of the variables measures. The concept of Ideal Self represents how an individual desires to be. It provides an "optimal" frame of reference through which individuals may evaluate their present self organization. The virtually identical scores on this variable for all groups provide support for Jourard and Secord's (1954) identification of the existence of a shared ideal for certain dimensions of the female figure and self-concept. Our culture emphasizes a very narrow definition of what the "ideal" woman in our society should be like, and the scores of individuals in the present study on Concept of Ideal Self reflect this widely accepted stereotype. It is to be expected that the ideal self scores in the study would be consistent across groups, and that scores representing a stable construct like our society's view of an ideal woman would not fluctuate as a result of treatment.

The correlation between scores on Self-Concept and Acceptance of Self must be considered when evaluating the differential effects of treatment on these variables. As cautioned by Tabachnick and Fidell (1983), when two dependent variables are highly correlated, any independent variable that affected one measure would surely affect the other, since they basically measure the same thing. Thus,

an explanation must be provided for the significant effect of treatment on Acceptance of Self but not on Self-Concept. When reporting intercorrelations among scales of the IAV, Bills (1975) stated:

In general, the Adult IAV scores are not so highly intercorrelated with each other that they cannot be judged to be significantly different from each other (p. 91).

If the two variables do, indeed, measure different things, it becomes important to clarify what accounts for the differential effects of treatment.

The working definition of self-concept developed by Shavelson et al. (1976) provides a theoretical framework that may contribute to interpretation of the present findings. The authors suggested that general self-concept is stable. However, when descending the self-concept hierarchy (toward individual experience in particular situations), self-concept depends increasingly on specific situations and thus becomes less stable. Similarly, Ben-Shlomo and Short (1986) noted that "certain measures of self-concept appear more sensitive to change than others" (p. 42).

The distinction between self-concept and self-esteem provided by Calhoun and Morse (1977) now becomes relevant. Self-concept is the "substantive description" individuals employ to identify their nature. Once a concept of self has been established, individuals are then able to determine whether or not they are satisfied with what they

see. This additional evaluative component has been labeled self-esteem. "Satisfaction" was identified as an important element when reference is made to the degree of esteem individuals hold for themselves. The authors concluded that "'self-concept' tends to remain a more stable, constant phenomenon, while 'self-esteem' may more readily fluctuate from time to time" (Calhoun & Morse, 1977, p. 320).

Examination of the Self-Concept and Acceptance of Self scales of the IAV suggests that they are measuring the concepts defined by Calhoun and Morse as "self-concept" and "self-esteem." The Acceptance of Self scale asks subjects how they feel about what they indicated on the Self-Concept scale, which corresponds to the evaluative component (i.e. the element of "satisfaction") of self-esteem described by Calhoun and Morse. By interpreting the Acceptance of Self scale as a measure of self-esteem, results of the current study support the theory that self-concept is a relatively stable phenomenon, while self-esteem may fluctuate more readily. A possible explanation for the finding that Acceptance of Self increased as a result of treatment while Self-Concept did not is thus provided.

As indicated by scores on the dependent measures, the experimental and placebo groups responded similarly to the treatment conditions even though only the experimental group evidenced significant improvement in cardiovascular fitness. These findings contrast with the observation of

Folkins and Sime (1981) that fitness effects must be documented before self-concept does indeed improve. For the placebo group, significant change occurred in the absence of improvement in fitness. Therefore, when exploring the mechanisms for the effects of treatment, factors other than mere cardiovascular improvement must be identified.

Goldwater and Collis (1985) noted that subjects in any type of fitness program might feel better simply because of their expectations of the benefits of conditioning programs. For example, Leonardson and Gargiulo (1978) demonstrated that subjects' perception of their fitness level correlated better with psychologic measures than actual measures of fitness did. Similarly, Heaps (1978) found that the information a person has about the effects of fitness training may be as important as, or more important than, the physical changes themselves.

It is to be noted that, although unanticipated, subjects in the placebo group did exhibit minor improvements in cardiovascular fitness. These findings resemble those of Goldwater and Collis (1985) in which even a small cardiovascular component in the placebo group's exercise program (which was necessary to assure the appearance of a fitness program) was sufficient to contribute to some gain in physical fitness. The difference between groups in fitness gain, however, makes

other explanations for the increase in self-concept plausible.

As previously noted, women in both groups had expectations for fitness benefits from the exercise classes, and these expectations may have been more influential in contributing to self-concept change than actual improvements in fitness. In both classes the subjects were able to develop a sense of mastery and self-efficacy as they acquired the skills necessary to participate in the choreographed aerobic dance routines. This sense of mastery is likely to be more pronounced in a conditioning program like the one in the present study, where the dance movements were more difficult and intricate, than in a program involving basic skills like running or weight lifting.

Other variables that potentially contributed to changes in self-concept include the social interaction available through participation in a group exercise program, positive feedback, encouragement and praise during exercise, and modeling enthusiastic instructors. The hypotheses generated by Greist et al. (1981) including distraction, positive habit or "addiction," and symptom relief are also applicable. Contrary to the previous research that concluded physical fitness improvement was necessary for psychological change (Folkins & Sime, 1981; Goldwater & Collis, 1985), the present findings suggest that change may occur in the absence of actual improvement

in physical fitness. The importance of alternative characteristics of conditioning programs and their contributions to psychological change must be emphasized.

Hypotheses 2 and 3

The hypotheses that physical fitness and body cathexis would be significantly negatively correlated with self-concept change were not supported. However, the correlation between initial fitness level and self-concept change approached significance ($r = -.224$, $p = .06$), indicating a trend for lower fitness scores to be associated with greater self-concept change.

An explanation for the present findings can be found in the literature examining which individuals benefit the most from physical conditioning. The consensus is that individuals in poor initial physical and/or psychological condition tend to show the greatest psychological improvement following physical conditioning (Ben-Shlomo & Short, 1986). Layman (1974) provided clarification by noting the following:

Improved physical fitness itself would be expected to result in improved self-concept only when the lack of fitness has been a basis for devaluation of the self (p. 49).

Subjects in the present study were healthy women who were required to provide evidence that they were initially in acceptable physical condition to participate in moderate exercise. Therefore, the requirements for inclusion in the

study automatically excluded subjects who may have demonstrated extreme deviance on physical or psychological variables. The subsequent limited range of scores on body cathexis and physical fitness may have prevented these variables from demonstrating statistical significance as predictors of self-concept change. In contrast to a population who generally has positive feelings about their bodies, it is likely that body cathexis would serve as a predictor of psychological change after physical conditioning in clinical populations such as women with eating disorders, rehabilitation clients, or cardiac patients (where a poor body image more clearly contributes to a devaluation of the self).

In the present study, physical fitness was measured solely on the basis of the run-walk test. A more accurate assessment could be obtained through the use of multiple fitness measurement techniques such as treadmill or bicycle ergometer tests. A more precise index of physical fitness may have contributed to a clearer understanding of the relationship between physical fitness and self-concept change.

A final explanation for the failure of the present findings to support the research hypotheses is the possibility of a ceiling effect. According to normative data provided by Bills (1975), means for the three scales of the IAV are 188.8 for Self-Concept, 183.7 for Acceptance of Self, and 213.6 for Ideal Self. The means for the

sample in the present study are comparable, suggesting that it was drawn from a population similar to the one the IAV was normed on. A perfect score for each of the three scales is 245. The small difference between the scale means and the maximal attainable score on the IAV indicate that, particularly for subjects scoring above the mean, there is little "room" (due to limitations in the measurement of the dependent variable) for the treatment condition to have an effect.

Implications for Future Research

The high rate of attrition typically found in studies utilizing physical conditioning programs was a difficulty encountered in the present study. Rates of attrition were comparable across the groups, suggesting that attrition was not a function of treatment conditions. However, smaller N's limit the generalizability of the findings, and attrition can be a confounding variable. The use of random assignment in the present study is an improvement over past designs in controlling extraneous variables, however, Folkins and Sime (1981) pointed out that "self-selected, motivated volunteers may demonstrate improvement in psychological functioning simply because they are motivated for overall self-improvement" (p. 386).

In examining characteristics of a physical conditioning program that would retain optimal numbers of

subjects, Martin and Dubbert (1982) suggested a treatment package that would include the following:

. . . a very convenient location, group-based, lower intensity exercise with enthusiastic participant therapists, ample modeling, feedback and social reinforcement, flexible, participant-influenced exercise goalsetting, and extensive family/social involvement (p. 1013).

A number of similar conclusions have been reached in the research on the factors that contribute to adherence to regular exercise. Future researchers should incorporate these suggestions into their exercise programs to control for the high rate of attrition in studies involving exercise programs.

In the present study, the run-walk test was the only index of physical fitness. Improvement in the measurement of this variable could be obtained through physiological tests of cardiorespiratory endurance, such as treadmill and bicycle ergometer tests to measure oxygen uptake. Such tests have been labeled maximal tests because they require an all-out performance by the subject. They are contrasted with submaximal tests (for example, the Harvard Step test), where performance is terminated when predetermined criteria are met.

When comparing the use of maximal versus submaximal tests of physical fitness, Thompson and Martin (1984) caution that subjects who are not highly motivated may fail to approach maximal output during testing. Benefits of maximal tests include the availability of an exact measure

of aerobic fitness level and maximum heart rate, which allows for an accurate specification of the appropriate training heart rate. However, the elaborate equipment required may make these tests prohibitively expensive in studies involving large N's. Researchers should consider these advantages and disadvantages when determining methods for measuring physical fitness in future studies.

The short duration of the present study is another limiting factor. Though eight weeks of conditioning at the appropriate frequency, intensity, and duration is adequate for obtaining cardiovascular improvement, it is less likely for such a brief intervention to strongly impact a relatively stable construct like self-concept. Future studies involving treatment interventions of longer duration would provide more information on the potential of physical conditioning for changing psychological constructs.

To help control for the effects of experimenter bias, it is recommended that multiple instructors who are each crossed with the various treatments be used in future research. The instructors should also be kept blind as to the nature of the study. In this way, the effect of experimenter bias is minimized, and the confounding of instructor characteristics on results can be eliminated (Mason, 1982).

It must also be noted that, during the seventh week, the experimental group didn't meet one evening when the

instructor was unable to conduct the class and the substitute failed to show up. Thus, the placebo group attended one more class than the experimental group, which could potentially confound the results. Though the circumstances were unavoidable, it is obvious that future studies should make every effort to keep variables other than the treatment condition as constant as possible.

The present study was restricted to women aged 20 to 50 as subjects. The use of more heterogenous samples may be indicated for future research. For example, a comparison of the effects of coed versus same-sex exercise classes would provide additional insight into the differential effects of social interaction between the sexes in conditioning programs.

A final implication for future research involves the need for experimental designs that confront the issues of who tends to benefit most from what types of activities. Though the assumptions required for statistical rigor and the need for generalizable results require large sample sizes, much of the meaningfulness of research findings can be lost through large samples. In order to accurately identify what types of programs benefit what types of individuals on what types of psychological variables, intensive exploration of small groups or case studies must be employed. Only through indepth investigation of the specific intricacies of the relationship between physical conditioning and psychological change can practitioners

begin to accurately employ such interventions as a viable treatment modality.

Implications for Counseling Practice

Low self-concept has been identified in numerous clinical populations including eating disorders (Nagelberg, Hale & Ware, 1984), depression, and anxiety (Higgins, Klein & Strauman, 1985). Women are represented more highly than men in each of these populations (Albino & Tedesco, 1983). The results of the present study indicate that physical conditioning can influence positive change in self-concept among women, and therefore may constitute a facilitative treatment intervention.

Numerous examples from the literature provide evidence that practitioners are beginning to utilize physical activity in combination with more traditional forms of group therapy as a method of intervention. Dohrmann-Rindskopf and Gratch (1982) described a structured group treatment format for women that met for two-hour weekly sessions for ten weeks. The first half hour of the sessions was spent walking and running together with female clients outdoors, while the remainder was devoted to traditional group psychotherapy. Van Den Bergh (1985) described a similar approach in which an aerobic therapy group also met weekly for ten weeks. The first hour was spent on aerobic (walking/jogging) activity, while the last

hour was devoted to group dialogue on topics germane to depression and stress.

The present study supports the premise that physical activity can be an effective treatment modality for practitioners working with women exhibiting low self-concept. Of particular importance is the finding that the exercise intervention does not necessarily have to be rigorous enough to exert significant cardiovascular improvement in order to contribute to change in self-concept. Mental health practitioners can begin to assist their clients with identifying an exercise program that is designed specifically for their needs, thus increasing the potential for adherence to their program and the opportunity to benefit from physical conditioning regimes.

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APPENDIX A

PERSONAL DATA SHEET

Name _____

Address _____

Phone _____

Age _____

PHYSICAL ACTIVITY READINESS QUESTIONNAIRE

1. Has your doctor ever told you that you have heart trouble?
YES NO

2. Has your doctor ever told you that you have cholesterol or triglyceride levels that are too high?
YES NO

3. Do you frequently have pains in your heart and/or your chest?
YES NO

4. Do you frequently feel dizzy or have spells of severe dizziness?
YES NO

5. Has your doctor ever told you that your blood pressure is too high?
YES NO

6. Do you have any bone or joint condition, such as arthritis, that might be aggravated or made worse by exercise?

YES NO

7. Is there a good physical reason not mentioned thus far why you could not do an exercise program, even if you wanted to?

YES NO

If you answered YES to any of the above questions, a statement from your physician that confirms your ability to safely do moderate aerobic exercise will be required before you may participate in the research project.

ACTIVITY LEVEL QUESTIONNAIRE

Please indicate the level at which you participate in the following forms of exercise according to these criteria:

HIGH: Exercise/active at a continuous heart rate for over 40 minutes, 4 or more times per week.

MEDIUM: Exercise/active at a continuous heart rate for 20-40 minutes, 2-3 times per week.

LOW: Sporadic/occasional participation, once per week or less.

NONE: No regular exercise program or sedentary.

	NONE	LOW	MEDIUM	HIGH
1. Walking	_____	_____	_____	_____
2. Running/jogging	_____	_____	_____	_____
3. Bicycling	_____	_____	_____	_____
4. Swimming	_____	_____	_____	_____
5. Handball/racquetball	_____	_____	_____	_____
6. Tennis	_____	_____	_____	_____
7. Golf	_____	_____	_____	_____
8. Rowing	_____	_____	_____	_____
9. Aerobic dance/exercise	_____	_____	_____	_____
10. Other (name) _____	_____	_____	_____	_____

BACKGROUND INFORMATIONEthnic Background

- _____ (1) Asian American
_____ (2) Black
_____ (3) Caucasian
_____ (4) Hispanic
_____ (5) Native American (U.S. Indian)
_____ (6) Other _____

Marital Status

- _____ (1) Single
_____ (2) Married

Education

- _____ (1) Less than high school
_____ (2) Some high school
_____ (3) High school diploma
_____ (4) Some college: Fr ____ Soph ____ Jr ____ Sr ____
_____ (5) Bachelor's degree
_____ (6) Some graduate work
_____ (7) Master's degree
_____ (8) Doctorate

Annual Family Income

- _____ (1) Under \$14,999
_____ (2) \$15,000 - \$24,999
_____ (3) \$25,000 - \$34,999
_____ (4) \$35,000 - \$44,999
_____ (5) Over \$45,000
_____ (6) Do not wish to indicate

APPENDIX B

BILLS INDEX OF ADJUSTMENT AND VALUES, ADULT FORM

Self Instructions for IAV

There is a need for each of us to know more about ourselves, but seldom do we have an opportunity to look at ourselves as we are or as we would like to be. On the answer sheet is a list of terms that to a certain degree describe people. Take each term separately and apply it to yourself by completing the following sentence:

I AM A (AN) _____ PERSON.

The first word in the list is acceptable, so you would substitute this term in the above sentence. It would read - I am an acceptable person.

Then decide HOW MUCH OF THE TIME this statement is like you, i.e., is typical or characteristic of you as an individual, and rate yourself on a scale from one to five according to the following key:

1. Seldom, is this like me.
2. Occasionally, this is like me.
3. About half of the time, this is like me.
4. A good deal of the time, this is like me.
5. Most of the time, this is like me.

Select the number beside the phrase that tells how much of the time the statement is like you and insert it in Column I on the answer sheet.

Now go to Column II. Use one of the statements given below to tell HOW YOU FEEL about yourself as described in Column I.

1. I very much dislike being as I am in this respect.
2. I dislike being as I am in this respect.
3. I neither dislike being as I am nor like being as I am in this respect.
4. I like being as I am in this respect.
5. I like very much being as I am in this respect.

You will select the number beside the statement that tells how you feel about the way you are and insert the number in Column II.

Finally, go to Column III; using the same term, complete the following sentence:

I WOULD LIKE TO BE A (AN) _____ PERSON.

Then decide HOW MUCH OF THE TIME you would like this trait to be characteristic of you and rate yourself on the following five point scale:

1. Seldom, is this like me.
2. Occasionally, this is like me.
3. About half of the time, this is like me.
4. A good deal of the time, this is like me.
5. Most of the time, this is like me.

You will select the number beside the phrase that tells you how much of the time you would like to be this kind of person and insert the number in Column III.

ANSWER SHEET FOR IAV

- | | | | | |
|-----|--------------|-------|-------|-------|
| 1. | acceptable | _____ | _____ | _____ |
| 2. | accurate | _____ | _____ | _____ |
| 3. | alert | _____ | _____ | _____ |
| 4. | ambitious | _____ | _____ | _____ |
| 5. | annoying | _____ | _____ | _____ |
| 6. | busy | _____ | _____ | _____ |
| 7. | calm | _____ | _____ | _____ |
| 8. | charming | _____ | _____ | _____ |
| 9. | clever | _____ | _____ | _____ |
| 10. | competent | _____ | _____ | _____ |
| 11. | confident | _____ | _____ | _____ |
| 12. | considerate | _____ | _____ | _____ |
| 13. | cruel | _____ | _____ | _____ |
| 14. | democratic | _____ | _____ | _____ |
| 15. | dependable | _____ | _____ | _____ |
| 16. | economical | _____ | _____ | _____ |
| 17. | efficient | _____ | _____ | _____ |
| 18. | fearful | _____ | _____ | _____ |
| 19. | friendly | _____ | _____ | _____ |
| 20. | fashionable | _____ | _____ | _____ |
| 21. | helpful | _____ | _____ | _____ |
| 22. | intellectual | _____ | _____ | _____ |

- | | | | | |
|-----|---------------|-------|-------|-------|
| 23. | kind | _____ | _____ | _____ |
| 24. | logical | _____ | _____ | _____ |
| 25. | meddlesome | _____ | _____ | _____ |
| 26. | merry | _____ | _____ | _____ |
| 27. | mature | _____ | _____ | _____ |
| 28. | nervous | _____ | _____ | _____ |
| 29. | normal | _____ | _____ | _____ |
| 30. | optimistic | _____ | _____ | _____ |
| 31. | poised | _____ | _____ | _____ |
| 32. | purposeful | _____ | _____ | _____ |
| 33. | reasonable | _____ | _____ | _____ |
| 34. | reckless | _____ | _____ | _____ |
| 35. | responsible | _____ | _____ | _____ |
| 36. | sarcastic | _____ | _____ | _____ |
| 37. | sincere | _____ | _____ | _____ |
| 38. | stable | _____ | _____ | _____ |
| 39. | studious | _____ | _____ | _____ |
| 40. | successful | _____ | _____ | _____ |
| 41. | stubborn | _____ | _____ | _____ |
| 42. | tactful | _____ | _____ | _____ |
| 43. | teachable | _____ | _____ | _____ |
| 44. | useful | _____ | _____ | _____ |
| 45. | worthy | _____ | _____ | _____ |
| 46. | broad-minded | _____ | _____ | _____ |
| 47. | businesslike | _____ | _____ | _____ |
| 48. | competitive | _____ | _____ | _____ |
| 49. | fault-finding | _____ | _____ | _____ |

APPENDIX C

THE BODY CATHEXIS SCALE

Below are listed a number of things characteristic of yourself or related to you. You are asked to indicate which things you are satisfied with exactly as they are, which things you worry about and would like to change if it were possible, and which things you have no feelings about one way or the other.

On the line next to each word below, write the number which best represents your feelings according to the following scale:

- (1) Have strong feelings and wish change could somehow be made.
- (2) Don't like, but can put up with.
- (3) Have no particular feelings one way or the other.
- (4) Am satisfied.
- (5) Consider myself fortunate.

Hair _____	Width of shoulders _____	Neck _____
Appetite _____	Arms _____	Posture _____
Hands _____	Chest _____	Face _____
Eyes _____	Digestion _____	Hips _____
Body Build _____	Weight _____	Profile _____
Nose _____	Lips _____	Height _____
Fingers _____	Legs _____	Age _____
Wrists _____	Shape of Head _____	Trunk _____
Breathing _____	Forehead _____	Feet _____
Waist _____	Energy Level _____	Sleep _____
Voice _____	Skin texture _____	Ears _____

Back _____	Sex activities _____	Health _____
Chin _____	Menstruation _____	Breasts _____
Ankles _____	Being a woman _____	Thighs _____
Knees _____	Facial complexion _____	Teeth _____
Elimination _____	Distribution of hair over body _____	Back view of head _____

APPENDIX D

INFORMED CONSENT

This research project has been designed to assess the effects of an aerobic dance class on personality characteristics. It is being conducted by Julie Cocklin, M.Ed., a Counseling Psychology Intern at Texas A&M University. Dr. Brent Snow, at Oklahoma State University, is chairman of the committee directing this research.

This study will require me to fill out a Personal Data Sheet, the Body Cathexis Scale, and Bills Index of Adjustment and Values. I will also be required to complete the Cooper 12 Minute Run-Walk Test, which consists of running, or running and walking, as far as possible in 12 minutes. Participation in this test involves possible risks including shortness of breath, chest pain, muscular discomfort, nausea, and, in extremely rare instances, heart attack or death. If I experience any of these symptoms, or other significant feelings of discomfort at any time during the test, I understand that I should quit running and walk until all symptoms stop.

I also understand that I will be selected at random to participate in an aerobics class, a toning class, or placed on a waiting list. The exercise classes will require my attendance one hour, three times per week, for eight weeks. If I am placed on the waiting list I may participate in the aerobics class after the initial eight week session.

I understand that participation in an exercise class involves minimal risks including, but not limited to, skeletal-muscular injuries (pulled or torn muscles, joint sprains or strains, stress fractures, contusions, cartilage or ligament damage) and cardiovascular related disorders (abnormal blood pressure, fainting, elevated heart rate during and after exercise, shortness of breath, and heart attack). The aerobics instructors will provide every effort to minimize these risks and increase my safety. Potential benefits that I may derive from an aerobics program include increased strength and efficiency of the lungs, increased

total blood volume, improved blood flow and lowered blood pressure, lower resting heart rate, and increased lean muscle tissue.

I also understand that my participation in this study is totally voluntary. I am free to withdraw my consent and to discontinue my participation in this study at any time for any reason. Should I so choose, this will be without penalty, and any results that are obtained will still be available to me. I have been assured that steps will be taken to ensure the confidentiality of my participation. Neither my name nor any other descriptor will be associated with publication or presentation of the results of this study.

I understand that in the event of physical injury resulting from the research procedures described to me that there will be no financial compensation or free medical treatment offered to me. However, if I am a student enrolled at Texas A & M University, the services of the health center are available.

Statement of Consent and Agreement:

I, the undersigned, do hereby agree to participate in the research described above. The nature and purpose of this research and the possible risks have been explained to me so that I understand them. I am freely agreeing to participate without duress or coercion.

I understand the research investigator may be legally liable for the obviously negligent conduct of this research. I also understand that harm may occur in the absence of any clearly negligent or intentionally harmful act. Therefore, in return for being accepted as a research participant, I release the research investigator, Texas A&M University, Oklahoma State University, and their agents from all liability and waive all my rights and claims against them, except those claims arising directly from clearly negligent or intentional harmful acts. This release from liability and waiver is made by me for myself, my heirs, and any person who might claim through me or on my behalf. It applies not only to the research investigator but also her assistants, agents and to the research institution and its employees.

Authorizing Signature:

All issues mentioned above have been discussed to my satisfaction and agreement. My signature indicates that I have read, understand and agree to all of the above.

Signature of Participant

Date

Signature of Witness

Date

If I have any further questions or concerns, I may contact the following:

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Work: 845-4427

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VITA

Julie Catherine Cocklin
Candidate for the Degree of
Doctor of Philosophy

Thesis: THE EFFECTS OF PHYSICAL FITNESS AND BODY CATHEXIS
ON SELF-CONCEPT CHANGE IN WOMEN AFTER AEROBIC
CONDITIONING

Major Field: Applied Behavioral Studies
Specialization: Counseling Psychology

Biographical:

Personal Data: Born in Oklahoma City, Oklahoma,
February 3, 1961, the daughter of Lee and Meredith
Cocklin.

Education: Graduated from Northwest Classen High
School, Oklahoma City, Oklahoma, in May, 1979;
received Bachelor of Arts Degree in Psychology
from Central State University in May, 1982;
received Master of Education degree in Counseling
Psychology from Central State University in May,
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July, 1988.

Professional Experience: Practicum Counselor, Bi-State
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January, 1986 to May, 1987; Practicum Counselor,
Marriage and Family Counseling Service, Oklahoma
State University, August, 1986 to May, 1987;
Administrative Supervisor, Professional
Rehabilitation and Occupational Services, March,
1984 to February, 1987; Counseling Psychology
Intern, Texas A&M University, August, 1988 to
present.