

THE EFFECTS OF A BODY AWARENESS
EXERCISE PROGRAM ON BODY CONCEPT, SELF
CONCEPT AND BODY COMPOSITION OF INACTIVE
OBESE AND NON-OBESE YOUNG WOMEN

91

by

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B.Ed., University of British Columbia, 1973

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF PHYSICAL EDUCATION

in

THE FACULTY OF GRADUATE STUDIES
(School of Physical Education and Recreation)

We accept this thesis as conforming
to the required standard

THE UNIVERSITY OF BRITISH COLUMBIA
November, 1977



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1977

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DEDICATION

I dedicate my thesis to my family who have supported me spiritually, emotionally and financially throughout my Master's program. For me, my Father's attitude towards obesity expresses the theme of my thesis:

"You can starve a Clydesdale but you will never get an Arabian, only a skinny Clydesdale"

I also dedicate my thesis to all Clydesdales (skinny or otherwise) who dream of becoming Arabians. Illusion destroys reality - reality destroys illusion. The result can only be a disillusioned Clydesdale.

ACKNOWLEDGEMENT

In appreciation for the help and understanding given to me, I want to thank the following persons for their support and assistance: my Chairperson, Dr. A. Carre; my Committee - Dr. R. Schutz, Dr. T. Rhodes, Dr. S. Brown, and Dr. R. Boshier, my sisters Lili and Marion, Jim Wright, Patricia Donahue Kaufman, the students who participated in this study, and a very special thank you to Celine Gunawardene without whose constant encouragement and typing my thesis would never have been completed in time.

ABSTRACT

The main problem was to study the effects of a 10 week body awareness exercise program on body concept, self concept and body composition change in inactive obese and non-obese young women as stated in Hypotheses One, Two and Three respectively. The subproblem was to examine the relationships among body concept, self concept, body composition and body composition change in inactive obese and non-obese young women. Hypothesis Four stated that inactive obese young women have a lower body concept than their non-obese counterpart. Hypothesis Five stated that the degree of change in body concept is proportional to the amount of change in body composition over the 10 week exercise program.

Data was obtained from 50 subjects who were female students between the ages of 17 and 25 years, living in Place Vanier and Totem Park Residences at the University of British Columbia, Vancouver, British Columbia. The treatment group participated in a 10 week body awareness exercise program for a minimum of three half-hour sessions a week, and was composed of 15 non-obese and 10 obese subjects. The control group was also composed of the same number of subjects but did not participate in the program. A 2x2x2 factorial design with repeated measures on the third factor was employed. The independent variables were treatment, size and time. Subjects were pre and posttested for the following five dependent variables: Body Cathexis, Physical Self, Self Cathexis, Total Self Concept, and Percent Body Fat. Instruments used were: the Secourd-Jourard Body Cathexis-Self Cathexis Scales, the Tennessee Self Concept Scale and the Yuhasz method for determining percent body fat.

Hypotheses One, Two and Three which stated that the use of the exercise program causes a positive change in body concept, self concept and body composition respectively, were analyzed using the ANOVA. Hypothesis One was not accepted (Body Cathexis change, $p = .61$; Physical Self change, $p = .07$); Hypothesis Two was not accepted (Self Cathexis change, $p = .18$; Total Self Concept change, $p = .06$); Hypothesis Three was accepted (Percent Body Fat change, $p = .01$). A correlation matrix on all dependent variables (pretest scores) indicated no significant relationship existed among these variables. Hypothesis Four was not accepted since the preplanned orthoganal comparision indicated no significant difference between obese and non-obese subjects. Hypothesis Five was not accepted since the correlation coefficients indicated that no significant correlation existed between body concept change scores and body composition change scores, although a trend was noted.

Within the limitations and delimitations of the sample population, experimental procedures utilized and statistical analyses performed, it was concluded that: (a) the program did not have a significant positive effect on body concept and self concept (however, the scores obtained from the Tennessee Self Concept Scale approached significance), (b) the program had a significant positive effect on body composition, (c) there were no significant relationships among body concept, self concept, body composition and body composition change in inactive obese and non-obese young women.

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CHAPTER 1

INTRODUCTION TO THE PROBLEM

The 'mind-body' relationship has become an extremely important therapeutic concept for the psychiatrist and psychologist today.

Schutz (1967) noted:

After many years of being all but ignored, the importance of body-functioning to emotional states is becoming recognized more widely and applied to (self) growth producing situations Feelings and behaviors are expressed in terms of all parts of the body, of body movement and of bodily functions... Supporting the recognition in everyday life of the close connections between bodily and emotional and mental states... psychosomatic medicine has made a strong case for the fact that emotional states affect the body. (p.27-29)

An individual's physical appearance during movement and at rest can be interpreted as a representation of his personality and attitude towards himself which reflects his body concept and self concept (Lowen, 1958).

How an individual perceives his body is closely related to how he feels about himself. The physical appearance of the obese individual is believed to adversely affect his body concept and self concept (Stuart, in press). This 'mind-body' relationship may be even more crucial for the obese woman. As Stuart pointed out:

The fact that they (women) suffer more from the social liability of weight, that they experience a cultural pressure to give appearance a central role in their self concept and that excessive fat is more visible on women, probably all contribute to the fact that a desire to improve their appearance is pivotal in women's decisions to attempt to lose weight. (p.12)

If, as noted by Stuart, there is such a relationship among body concept, self concept and obesity, then a key factor involved in the

management of obesity lies in how the obese woman perceives her body and her personal worth.

The prevention and correction of obesity has been based mainly on programs emphasizing decreased caloric intake (diet) and/or increased caloric expenditure (exercise). These programs have been mainly under the supervision and control of a variety of professionals in the medical, psychological, and physiological fields.

The majority of studies reviewing the medical treatment of the obese condition involved the use of caloric restriction such as dieting or fasting to obtain weight loss (Kline, Coleman, & Wick, 1976). Several studies concerning psychological treatment of the obese condition involved the use of various types of psychotherapy, such as hypnotherapy and behavior modification, to reinforce caloric restriction (Kline et al.). Many studies regarding the physiological treatment of the obese condition involved the use of exercise programs to increase caloric expenditure (Clarke, 1975).

The majority of exercise programs used in the physiological treatment of obesity involved programs which emphasized the 'fitness or fatness' approach with such activities as walking, jogging, running, weight training and calisthenics (Clarke). Few studies have been conducted in which other types of activity programs such as body awareness exercise programs have been employed as a treatment for obesity.

Many investigators have researched body composition change, body concept change and/or self concept change as a result of exercise programs

designed specifically to obtain physiological change (Clarke; Stuart). Few investigators however, have researched body composition change, body concept change and/or self concept change as a result of exercise programs designed specifically to obtain psychological change. In view of the scarcity of research in this area, the present study focuses on both the psychological and physiological effects of an exercise program designed specifically to obtain psychological change in body concept and self concept and physiological change in body composition of inactive obese and non-obese young women. The body awareness exercise program employed in this study was specifically designed to emphasize body awareness, movement satisfaction, body concept, and self concept in order to obtain psychological change. The traditional, conventional exercise programs for inactive obese and/or non-obese young women have been designed specifically to emphasize 'fitness or fatness', fat and/or weight loss, improved cardiovascular-respiratory efficiency, strength, endurance and/or flexibility in order to obtain physiological change.

STATEMENT OF PROBLEM

The primary purpose of this investigation was to study the effects of a body awareness exercise program on body concept, self concept and body composition of inactive obese and non-obese young women.

Subproblem

A secondary purpose of this investigation was to examine the relationships among body concept, self concept, body composition and body composition change in inactive obese and non-obese young women.

HYPOTHESES

Hypothesis One: The use of a body awareness exercise program causes a positive change in the body concept of inactive obese and non-obese young women.

Rationale: By exploring the 'isolation technique' of body movement, the individual will increase her knowledge about herself, her body, how she moves and what her body's capabilities are. Feldenkrais (1972) stated that "movement is the basis of awareness" (p.36) and that "a person's physical build and his abilities to move are more important to his self image than anything else" (p.34).

Hypothesis Two: The use of a body awareness exercise program causes a positive change in the self concept of inactive obese and non-obese young women.

Rationale: Movement is a key factor in the development of body concept. Body concept based on an individual's evaluation of her physical self; how she views her body, her state of health, her physical appearance in terms of identity (what I am) and self satisfaction (how I feel about myself) is a factor in the formulation of an individual's self concept (Fitts, 1965).

Hypothesis Three: The use of a body awareness exercise program causes body composition change in inactive obese and non-obese young women.

Rationale: It has been concluded by several authors that regular sessions of physical activity will cause an increase in caloric

expenditure, which when accumulated over time, results in a decrease in fat tissue and an increase in lean body tissue (Behnke & Wilmore, 1974; Clarke; Oscai, 1973).

Hypothesis Four: Inactive obese women have a lower body concept than inactive non-obese young women.

Rationale: Size and appearance affects the way an individual feels about herself and her body. Wicks (1976) noted:

Once the patient has become overweight, his obese status creates new problems. They include his own difficulty to accept himself in the role of an obese individual, and his resulting self rejection coupled with and reinforced by the response from a weight conscious society (p.19).

Hypothesis Five: In inactive obese young women, the degree of change in body concept is proportional to the amount of change in body composition over a ten week body awareness exercise program.

Rationale: Stoner and Fiorello (1976) found that in a program designed for obese adolescent females which emphasized improving self-concept as well as losing weight, the program did result in a significant positive change in the Physical Self score from the Tennessee Self Concept Scale in addition to weight loss.

DEFINITIONS

Body Awareness: The knowledge and comprehension of how specific body parts can be moved in relation to each other and to the body as a whole, based on awareness of kinesthetic sensation (Mauldson & Layson, 1965).

Body Awareness Exercise Program: An exercise program designed specifically to develop and/or improve body awareness through rhythmical movement based on the 'isolation technique' (see Appendix D for a complete description of program).

Body Composition: The composition of the body in terms of the proportion of body fat and lean tissue (Behnke & Wilmore). Composition, operationally defined, is based on the Yuhasz (1973) scoring chart (see Appendix B).

Body Composition Change: The change in proportion of fat and lean body tissues (Behnke & Wilmore). Operationally defined, body composition change is the difference between pretest and posttest scores for body composition.

Body Concept: Body concept or body cathexis is the degree of feeling satisfaction or dissatisfaction with the various parts or processes of the body (Secord & Jourard, 1953). Operationally defined, body concept is the set of scores obtained from the Body Cathexis Scale (Secord & Jourard) and the Physical Self Score obtained from the Tennessee Self Concept Scale (Fitts).

Inactivity: Participation in the form of regular physical activity for less than a total of two hours a week (see Appendix A).

Isolation Technique: A technique for learning control over one's bodily movement. One or more specific joints are isolated for movement while the remainder of the body is relaxed, being used for balance and support. The possible range of movement for the specific joint or joints is

explored and experienced. Control is obtained through practice (Mishkin & Schill, 1973).

Obesity: A physiological condition of excess fatty tissue resulting from either excessive caloric intake or insufficient caloric expenditure or both (Oscai). Operationally defined, an individual was classified as obese if the percent body fat was above 23 percent (see Appendix B).

Self Concept: The perception an individual has of himself in relationship to his environment. Rogers (1951) defined self concept as follows:

Self concept is an organized configuration of perceptions of self which are admissible to awareness. It is composed of such elements as the perception of one's characteristics and abilities; the percepts and concepts of the self in relation to others and the environment, the value of qualities which are perceived as associated with experiences and objects; the goals and ideals which are perceived as having positive or negative values. (p.136)

Operationally defined, self concept is the set of scores obtained from the Self Cathexis Scale (Secord & Jourard) and the Tennessee Self Concept Scale (Fitts).

DELIMITATIONS

1. Inferences are restricted to female university resident students between the ages of 17 and 25 years.
2. Body concept and self concept are restricted to evaluation by the Body Cathexis, Self Cathexis and Tennessee Self Concept Scales.
3. Obesity is restricted to evaluation by the Yuhasz method of skin-fold measurement.
4. Effects of the body awareness exercise program were assessed after a 10 week period, therefore inferences are delimited to programs of that length.

ASSUMPTIONS AND LIMITATIONS

1. Body concept can be evaluated by the Physical Self section of the Tennessee Self Concept Scale (Fitts) and the Body Cathexis Scale (Secord & Jourard) paper and pencil tests.
2. Self concept can be evaluated by the Tennessee Self Concept Scale (Fitts) and the Self Cathexis Scale (Secord & Jourard) paper and pencil tests.
3. Body composition can be evaluated by using the Yuhasz skinfold measurement technique (Yuhasz).
4. Body composition change can be evaluated by a comparison of pretest and posttest skinfold measures.
5. It was assumed that subjects continued normal daily eating and activity habits since there was no control over diet or activity.
6. The length of the program was limited to the time period of the school term.
7. Participation in the movement program was limited to a minimum of three half-hour sessions per week and a maximum of eight.
8. The area used for exercise program was limited to the Haida House lounge in Totem Park and Tweedsmuir House lounge in Place Vanier which were public residence lounges. This was inconvenient since the subjects were in view of the public passing by the lounges and often were observed while exercising which resulted in some degree of self consciousness and uneasiness in the subjects.

SIGNIFICANCE OF THE STUDY

Long term 'weight' management for the prevention and correction of obesity is a very critical issue in public health today (Clarke; Kindl & Brown, 1976; Kline et al.; Oscai). Obesity (within normal conditions) may be defined as a physiological condition resulting from either excessive caloric intake or insufficient caloric expenditure, or both (Oscai). However, obesity is the physiological condition only, the result. The possible underlying factors which might cause or affect obesity also need to be considered. A starting point in the management of obesity should begin with the investigation of the 'mind-body' relationship between the psychological factors involved in body awareness, body concept and self concept and the effect of these psychological factors on caloric intake and caloric expenditure.

This 'mind-body' relationship is an extremely important concept for the physical educator to understand. Relevant information pertaining to the relationships between body-self concept and obesity, body-self concept and inactivity, and body-self concept and body composition change could supply valuable insight and understanding of possible psychological factors involved in obesity and inactivity. This information could be used in designing exercise programs specifically to enhance body and self concept, to improve body appearance, and to increase the level of physical activity. If an exercise program could be designed which would help the inactive obese woman to become less inactive and less obese as well as improve her body awareness, body concept and self concept at the same time, it is likely that she would feel successful and continue to become more active and less

obese as a result of this successful movement experience.

Many treatments have been designed for the prevention and correction of obesity, but none seem to have a lasting effect. Seldom does a loss in weight become a permanent weight loss (Kindl & Brown). Kindl and Brown stated:

Our sedentary life style is probably the biggest factor in the high incidence of obesity....To effect a permanent weight loss and attain good health, the overweight person must learn to enjoy increased physical activity. (p.39)

The prevention and correction of obesity poses a particularly challenging problem for the physical educator. If an exercise program for the inactive obese and non-obese woman could be designed to increase the level of enjoyment and participation in physical activity, then the physical educator would have a suitable therapeutic medium to offer for the prevention and correction of obesity.

The type of body awareness exercise program employed in this study could prove to be an effective alternate method to consider for the treatment and prevention of the obese condition in inactive women since it considers the possible psychological causes for the obese condition as well as the inactive condition. Such a program could provide the inactive obese woman with a successful movement experience which results in improved appearance rather than a non-successful diet experience which results in failure. Too often the inactive obese woman subjects herself to an endless series of attempts and failures with diets, quickie 'weight-reducing' gimmicks or seldom continued, seldom finished exercise programs. The body awareness exercise program could also be

beneficial for the inactive non-obese woman as a method to stimulate increased physical activity thus preventing obesity due to inactivity.

Since women prefer rhythmical, dance-oriented exercise (Nelson & Brown, 1970) and are more concerned about physical appearance than physical health (Stuart), these factors should be included in the design of an exercise program for women in order to ensure maximum enjoyment and participation. The body awareness exercise program employed in this study has been designed specifically to affect body concept and self concept through the use of rhythmical movement in order to obtain an increase in the level of enjoyment and participation in physical activity in inactive obese and non-obese young women.

CHAPTER II

REVIEW OF LITERATURE

Obesity has been defined in terms of the physiological condition of accumulated excess fat. (Oscai, 1973). A very common misconception is to assume that being obese is synonymous with being overweight. This is emphasized by the United States Department of Health, Education and Welfare manual on Obesity and Health (1966):

It cannot be overstated that assigning a label of obese... should come only after a comprehensive assessment of all pertinent factors. The sex of the subject, age, body type and state of health along with specific measurements such as a skinfold thickness must be considered in determining if a person is obese. Comparing...height and weight with a given set of average standards does not give adequate information on which to assess obesity since such comparisons imply weight not fatness. (p.2)

In reviewing the literature about the complexities of obesity, the investigator noted many studies and articles which continued to perpetrate this misconception regarding the obese and overweight condition. Obesity was generally defined in terms of percent of weight above ideal body weight as determined by standard 'height-weight' tables (Stuart, in press). This type of definition does not allow for the large-framed, well muscled individual who is defined as overweight and hence, obese, or the small-framed individual with excess fat who is defined as average and hence non-obese because frame size and body composition are not concisely defined. (Stuart). This error in definition is critical for the identification of obesity (Grande, 1973). Therefore, literature relying on the 'overweight' view of obesity was not generally included in this review.

The literature is reviewed in the following areas: (1) obesity: etiology, measurement, incidence, effects, and treatment; (2) obesity and its effect on body concept and self concept and (3) obesity and physical activity.

OBESITY: ETIOLOGY, MEASUREMENT, INCIDENCE, EFFECTS AND TREATMENT

Etiology of Obesity

Obesity has been defined in terms of a physical condition, but there are certain psychological and sociological factors affecting the individual which influence the obese condition. Bray (1976) noted that there were widely recognized psychological factors in obesity but it was difficult to define a specific personality type in association with obesity. Two types of obesity differentiated by Bruch (1973a) were classified as (1) reactive obesity which resulted from excessive caloric intake due to emotional reaction to environmental situation and (2) developmental obesity in which emotional problems were minimal.

An etiologic classification of factors involved in obesity was suggested by Mayer (1957) in which genetic, hypothalamic and/or other central nervous system origins, and endocrine disorders were defined as physiological factors while immobilization, psychic disturbances, social and cultural pressures were defined as psychological factors. Mayer (1976) noted that obesity developed within a permissive interaction of genetic, traumatic and/or environmental factors.

The age of onset of obesity was employed by Bray (1976) to differentiate etiologic factors involved in youth and adult obesity. For those who became obese before 18 years of age, etiology involved

genetic, infant feeding, endocrine, hypothalamic and drug factors. Feeding patterns, inactivity, endocrine, pregnancy, hypothalamic and drugs were the etiologic factors involved in the adult-aged onset of obesity.

A summary of etiologic factors involved in obesity compiled by Coleman (1976) included:

The social, the psychological, the physical, the emotional, the habitual, the hereditary, the genetic, the ethnic, the geographical, the cultural, the structural, the nutritional, the dietary, the metabolic, the chemical, the physiological, the hormonal, the psychosocial, the economic...(p.83)

Coleman concluded his discussion of factors involved in obesity by stating that unless both psychological and physiological factors were considered in the evaluation of the causes of obesity for each individual, failure in treatment would be inevitable.

Measurement of Obesity

The term obesity is applied to the condition of excess body fat deposits. The degree of body fat may be determined by several laboratory and field methods. Methods such as prediction of body fat from body water, body potassium, body density, or inert gas uptake involve the use of a laboratory situation (Behnke & Wilmore, 1974; Grande, 1973). The most commonly accepted field method for prediction of body fat is the skinfold thickness measurement technique using calipers (Grande). The skinfold measurement technique allows for ease of reliability, use of equipment, time and personnel, as well as having well-standardized norms (Grande).

Several studies have been conducted on various populations to determine the correlation between skinfold thickness measures and body density measures with the conclusion that skinfold thickness measures correlate negatively with body density measures (Behnke & Wilmore; Grande). A study which closely approximated the characteristics of the population of the present study was undertaken by Young, Martin, Chirhan, McCarthy, Manniello, Harmeth and Fryer (1961) involving 94 middle and upper class female university student volunteers with a mean age of 20 years. A correlation of $-.68$ was found between skinfold measures and body density measures.

Several methods for predicting body fat measurement from skinfold measurement have been suggested, the difference involving the number of skinfold sites employed (Grande). Seltzer and Mayer (1965) recommended the use of only one site (the triceps). Three sites (the triceps, subscapular and abdominal) were used by Glick and Kaufman (1976). Yuhasz (1973) recommended the use of six sites (the triceps, subscapular, abdominal, suprailiac, front thigh and rear thigh for women).

Incidence of Obesity

Obesity is far more prevalent than any other disorder except for undiagnosed and diagnosed atherosclerosis (Yudkin, 1974) and is the most prevalent metabolic disorder (Kennel & Gordon, 1973) in affluent countries.

Several estimates have been made to determine the percentage of obese people in a specific population but due to variability in the definition of obesity, in instrumentation and in methodology, it

is difficult to state a generally accepted proportion (Christakis, 1973).

In the Framingham Study conducted by Kannel and Gordon, it was found that in a population of 5209 men and women aged 30 to 62 years, incidence of obesity was greater in females than in males: 20 percent of the women and 15 percent of the men were 35 percent above average weight while nine percent of the women and three percent of the men were 50 percent above the average weight (as determined by standard 'height-weight' tables).

Age of onset was used as a basis for classifying development and prevalence of obesity in the general population. Danowski (1973) noted in any group of 100 fat adults, 25 became overweight before the age of 12, and 12 or 13 of these were already overweight by the age of six; approximately 25 developed weight problems as teenagers or shortly after leaving high school; another 25 began to be overweight after marriage and/or one or more pregnancies; the remaining 25 became heavy in their 30's or 40's.

Effects of Obesity

Obesity causes or adds to many psychological and physiological problems. Obesity is stigmatized as a sin of self-indulgence, as a disease with psychological and physiological consequences, and as an ugliness (Allon, 1973).

Excess fat deposits affect the physical appearance of the obese individual often resulting in complex psychological problems. Allon

remarked that as a result of their condition many fat persons felt "self disparagement and self hatred and trebly disadvantaged (1) because they are discriminated against, (2) because they are made to feel that they deserve such behaviour, (3) because they come to accept their treatment as just" (p.84).

Hirsch (1973) noted emotional effects ranging from inferiority to very serious incapacities resulted when the obese condition interfered with socialization or even sexual activity. As a result of negative social judgments and opinions, the obese individual experienced a vulnerability which was related to personal and emotional problems (Bruch, 1973b). Mayer (1968) suggested that obese girls suffered from prejudice and discrimination resulting in feelings of self-blame and inferiority.

Physical appearance, which was found to be the most important factor in dating behavior in college students (Walster, Aronson, Abramham and Rothman, 1966) and in women marrying above their social class (Elder, 1969), places the obese female at a disadvantage. Canning and Mayer (1966) suggested a possible link between the physical appearance of the obese person and college acceptance after they noted that two-thirds more non-obese than obese high school applicants were accepted by colleges. They suggested that obesity may be more characteristic of lower classes because the obese are "prevented from obtaining the education and ultimately the occupation and income necessary to raise or maintain present social class levels" (p.1174).

The negative effects of obesity on body concept and self concept have been noted by several authors. (Bruch, 1973a, 1973b; Dwyer & Mayer, 1973; Nathan, 1973; Stunkard & Mendelson, 1961, 1967). A review of the area of obesity and the effects on body concept and self concept is presented in a separate section because of the importance of the area to the present study.

The physiological effect of excess fat deposits has been observed as an excess stress on all systems and organs of the body. Physiological strain, as observed by several authors was noted in changes in body functioning: increased incidence of respiratory diseases, high blood pressure, atherosclerosis, cardiovascular dysfunction, endocrine and metabolic changes, diabetes, renal and gall bladder dysfunction, risk in surgery, risk in pregnancy, increased stress on weight bearing surfaces leading to osteoarthritis (Bray, 1976; Clarke, 1975; Tomkin, 1975; United States Department of Health, Education and Welfare, 1966).

Treatment of Obesity

Since obesity is a condition resulting from an energy imbalance due to excessive caloric intake or insufficient caloric expenditure, treatment is consequently based on reversing the causes of the imbalance (Oscail). Obesity most often has been treated by the medical professionals who rely on various methods of decreasing caloric intake through dieting and fasting (Ley, Bradshaw, Kinsey, Couper-Smart and Wilson, 1973), and psychological professionals who employ techniques to support and/or reinforce these attempts at dieting and fasting (Bray, 1976; Kline, Coleman & Wick, 1976). Since it is not within the nature of the present

study to expand upon or present new information about the subject of decreasing caloric intake, the reader is referred to Bray (1973, 1976) and Kline et al..

Methods employed for increasing caloric expenditure involve the use of various types of physical activity programs and thus lie within the domain of the physical educator. A review of the beneficial psychological and physiological effects of physical activity on obesity is presented in a separate section because of the importance of the area to the present study.

OBESITY AND ITS EFFECT ON BODY CONCEPT AND SELF CONCEPT

The negative effects of obesity on body concept and self concept have been noted by several authors (Bruch, 1973a, 1973b; Dwyer & Mayer, 1973; Nathan, 1973; Stunkard & Mendelson, 1961, 1967). In order to understand the manner in which a physiological condition such as obesity may affect the psychological constructs of body concept and self concept, it is necessary to review the literature in the following areas: (1) the relationship between body concept and self concept and (2) the effects of obesity on body concept and self concept. Since it is not within the nature of the present study to elaborate upon or detail the psychological evolution, refinement and evaluation of body concept and self concept in depth, the reader is referred to Duval and Wickl nd (1972), Feldenkrais (1972), Lowen (1967, 1975), Rogers (1951), Webster and Sobieszek (1974), Wells and Marwell (1976) and Wylie (1974).

Relationship Between Body Concept and Self Concept

Body concept has been defined by Secord and Jourard (1953) in terms of body cathexis or the degree of feeling satisfaction or dissatisfaction with the various parts and/or processes of the body.

Fitts (1965) defined the individual's perception of the physical self as the perception of his body, the state of his health; his physical appearance, skills, and sexuality in terms of identity (what he is as he sees himself), self satisfaction (how he feels about the self he perceives), and behavior (how he perceives his own behavior or the way he functions). Body image (body concept) was perceived by Stunkard and Mendelson (1961, 1967) as the concept each individual has of his own body as an object in space independent and apart from all other objects.

Self concept, as defined by the International Encyclopedia of the Sciences (1968) was represented as a process in the developmental sense:

A developmental formation in the psychological make-up of the individual consisting of interrelated attitudes that the individual has acquired in relation to his own body and its parts, to his capacities and to objects, persons, family, groups and institutions which define and regulate his relatedness to them in concrete situations and activities. (p. 153)

Fitts defined self-esteem (self concept) according to three aspects: "(1) this is what I am, (2) this is how I feel about myself, and (3) this is what I do" (p.2) in the areas of physical self, moral-ethical self, personal self, family self, and social self. It was suggested by Douty, Moore and Hartford (1974) that possibly the most influential factor affecting an individual's perception of his world, his behavior, his self image (self concept) is "his perception of other's attitudes towards him.

What others define as the person and show in their actions towards him may be more important than his feelings or emotional reaction to himself" (p.500).

The relationship between body concept and self concept has been studied by various investigators. Notably, Secord and Jourard hypothesized that the body would be cathected in a similar manner as the self. In their often-referenced investigation of the relationship between body cathexis and self cathexis, they found a correlation of $r=.58$ for males and $r=.66$ for females. Studies by Weinberg (1960) and Rosen and Ross (1968) substantiated the results of Secord and Jourard. White and Wash (1965) found a correlation of $r=.71$ between body cathexis and self cathexis in a study population composed of university students. Learner, Karabenick and Stuart (1973) studying adolescents' attitude towards their physique and its effect on self concept noted that the degree of positive self concept increased with the degree of satisfaction or positive attitude towards one's body characteristics.

Effects of Obesity on Body Concept and Self Concept

Obesity and its resulting physical appearance has a very definite effect upon the perceptions of one's body and one's self (Bruch, 1973a, 1973b). Two important aspects have been linked to the perception of the body by the obese individual: (1) the distortion of body size and (2) the disturbance in body concept (Glucksman & Hirsch, 1969).

The distortion of body size. The distortion of body size has often been observed in obese individuals (Bailey, Schendling and Payne, 1968;

Cappon & Bank, 1968; Glucksman & Hirsch, 1969, Hirsch, 1973). Cappon and Bank investigating the degree of distortion in body size perception found that the obese group overestimated their size, and the errors in prediction of width and thickness were "a function of obesity rather than size per se....after confrontation with their image in a mirror, the errors diminished significantly at least for a short period" (p.446). Bailey et al. found similar results with overweight individuals who tended to perceive a larger body size than those who were non-obese.

The perception of body size appeared to play an important role in both the obese and the reduced states. Glucksman and Hirsch concluded that there was denial and distortion of one's appearance by the obese individual. They found that for some obese people a 'phantom body size' phenomenon existed, that is, obese subjects increasingly overestimated body size during and after weight reduction. An explanation for the cause of this 'phantom body size' phenomenon was the suggestion that "body size image before weight loss (is) relatively fixed and (it) cannot be altered as rapidly as an actual change in body configuration" (p.6). Hirsch further added:

With the childhood-onset obese, there is a persistent sensation of obesity in spite of weight reduction...the reality of a weight reduction is in many ways experienced as a threat to self image and body integrity ...psychological consequences of obesity are most clearly seen only when weight is reduced..imprinted with obesity...weight reduction leads to psychological changes that might be expected when realistic weight and body size differ from imprinted or optimal level. (p.82)

The disturbance in body concept. The disturbance in body concept was noted to be manifested in the way one viewed himself, his self consciousness in general and his self consciousness in relationship to

the opposite sex (Stunkard & Mendelson, 1967). A critical factor in the degree of disturbance was the age of onset of obesity (Dwyer & Mayer, 1968, 1973; Hirsch, 1973; Monello & Mayer, 1963; Silverstone, 1973; Stunkard & Burt, 1967; Stunkard & Mendelson, 1961, 1967).

Investigations by Stunkard and Burt, and Stunkard and Mendelson (1961, 1967) demonstrated that age of onset of obesity was a critical factor in the disturbance of body concept. They found that the disturbance occurred almost exclusively among patients who became obese during childhood or adolescence. Not one in 40 adult-aged onset patients suffered from severe disturbances whereas 17 out of 34 juvenile-aged onset patients suffered severe disturbances. Other important factors in predisposing body concept disturbances were the presence of emotional disturbance and the negative evaluation of the obese condition by significant others. Among juvenile-aged onset obese, the body concept was usually a central factor to any emotional disorder but not so with adult-aged onset obese.

The disturbance in body concept was characterized by Stunkard and Mendelson (1967) as feelings that "one's body is grotesque and loathesome and that others view it with hostility and contempt " (p.1229). This disturbance in body concept was found to be unlike that exhibited by brain-damaged or schizophrenic people. The obese individual often became so preoccupied with his obesity that he excluded all other personality traits. Stunkard and Mendelson suggested that "a kind of circular relationship (existed) between body image (body concept) disturbances which predisposes to self-esteem lowering experiences and depressive moods which

in turn reinforce the disturbed body image..." (p.1297).

The attitude of parents and peers towards a child and his body were noted to have a very definite effect on his body concept and self concept. Nathan (1973) pointed out:

Derogatory, critical comments directed towards overweight children and adolescents are incorporated into enduring images of the self. (p.456).

With increasing age, the obese child's internalization of negative social attitude towards obesity results in the denial and self avoidance of normal bodily interest, self hatred and feelings of ugliness and inadequacies. (p.460).

The effects of obesity on body concept appeared to have the greatest impact on the obese adolescent. Monello and Mayer after studying obese adolescent girls suggested that in fact, these girls behaved as a minority group exhibiting characteristics of isolation and rejection resulting in withdrawal, but without the support of the minority 'in-group' for peer acceptance. The obese adolescent was placed in the uncompromising position of needing peer approval and independence from parents more than parental approval and dependence. However, rejection by the peer group left the adolescent with only the parents for approval.

Obese adolescent girls were observed to express more guilty feelings about their condition and to be more affected by negative social and cultural attitudes towards their condition than individuals with other types of physical abnormalities because they felt that it was their lack of control which caused their condition, not fate (Dwyer & Mayer, 1968). Often the obese adolescent girl thought that she ate much more than the non-obese girl when in fact she actually ate less

(Monello & Mayer). Dwyer and Mayer (1968, 1973) also found that preoccupation with physical appearance and intense anxiety over weight change often persisted even after the obese condition had been reduced.

Summarizing the psychological effects of obesity on the adolescent, Hammer (1975) concluded that "damage to the teenager in self concept may be irreparable, their low self esteem, feelings of rejection, loneliness and depression become difficult if not impossible to change" (p.788).

The body cathexis (body concept) and self cathexis (self concept) of super-obese patients were studied by Gottsfeld (1962). The super-obese group was compared to a group of neurotics. Body cathexis was assessed using self figure-drawings. Evaluated by 'global clinical judgment' to determine positive or negative body cathexis, 25 out of 30 drawings judged as showing the most negative body cathexis belonged to the super-obese group, only five belonged to the neurotic group. Judgment of negative feelings according to the omission of body parts revealed that 12 out of 13 drawings which displayed missing body parts belonged to the super-obese group. The degree of differentiation (as determined by the higher the score, the greater the degree of differentiation) showed a mean of 19.7 for the super-obese group and 42.6 for the neurotic group. The opposite results were found in the assessment of self cathexis which was evaluated by means of a questionnaire. Results showed that 22 out of the 30 most dissatisfied responses belonged to the neurotic group and only eight belonged to the super-obese group. This conflict of results, in which the super-obese showed the most negative body cathexis

and yet showed the least negative self cathexis, was explained in terms of the choice of measurement instruments. The self figure-drawings represented the unconscious aspect of attitude; the self descriptive questionnaire represented the more conscious level of attitude. Gottsfeld also noted that the super-obese individual was unable to "accept a negative self-description of himself and on the conscious level portrays himself as well satisfied" (p.317). Comparisons of observed behavior and self-reported behavior disclosed a disparity in perceptions. The obese rated themselves closer to their ideal selves than to their observed real selves. Based on these observations, Gottsfeld suggested that the most effective treatment for the ~~super-obese~~ should include some form of psychotherapy, but this could be difficult because the super-obese tend to deny that there is anything wrong with their personalities and hence their motivation for psychotherapy is poor. Stanley, Glasser, Levin, Adams, and Coley (1970) suggested that programs for obese adolescents need to concentrate more on the improvement of body concept and self concept. They observed that those obese adolescents who managed successful weight loss "in some way improved their body image or self image or both, which in turn helped them to keep their weight down" (p.34).

Stoner and Fiorello (1976) emphasized that unless a program for obese individuals was designed to affect a change in self concept as well as weight loss, a change in self concept could not be expected to accompany a change in weight loss. They designed a counselling program in which the major emphasis was on improved physical appearance by means of improving personal grooming and social skills instead of

concentrating solely on weight loss. A significant difference between treatment and control group was found in the Physical Self score but not in the overall Total Self score as evaluated by the Tennessee Self Concept Scale.

OBESITY AND PHYSICAL ACTIVITY

Obesity has been defined as an energy imbalance which is the result of excessive caloric intake or insufficient caloric expenditure or both (Oscai, 1973). Regulating caloric intake through diet will correct the problem of excessive caloric intake; increasing physical activity will correct the problem of insufficient caloric expenditure. In order to explain the effects of a body awareness exercise program on body concept, self concept, and body composition in inactive obese and non-obese young women, it is necessary to review the literature in the following areas: (1) the relationship between physical activity and obesity, (2) the psychological effects of physical activity on the obese individual, and (3) the physiological effects of physical activity on the obese individual.

The Relationship Between Obesity and Physical Activity

It is a well-investigated fact that physical inactivity is a major factor involved in obesity (Clarke, 1975; Johnson, Burke and Mayer, 1956; Mayer, 1957, 1968, 1976; Roby, 1969; Wells, 1972). However, there are two persistent popular misconceptions perpetrated and accepted regarding the function of physical activity and metabolic regulation (Mayer, 1968, 1976): (1) exercise requires relatively little caloric expenditure. This is

wrong particularly for the obese individual. The cumulative effects of exercise increases proportionally to body weight. Therefore, an obese individual utilizes more body fat than a non-obese individual for the same amount of activity. Evidence has shown that caloric expenditure continues above basal levels for several hours after the activity is completed. (Danowski, 1973; Mayer, 1968; Roby), (2) an increase in physical activity at any level of caloric intake is followed by an automatic increase in appetite and as such is a self defeating weight control measure. This presumed relationship is not valid if the individual is inactive to begin with. Decreasing the amount of physical activity below a certain level will no longer be accompanied by a decrease in appetite which explains why underexercising is an important cause in the prevalence of obesity (Mayer, 1968, 1976). It has been shown that moderate daily physical activity regulated appetite and in some cases diminished appetite to the requirements of a sedentary level. (Mayer, 1968; Roby).

The level of physical activity is a critical factor in obesity at all ages but particularly in childhood and adolescence. (Clydesdale, 1975; Mayer, 1976). At the infant age, Mayer (1976) observed that active babies often ate more but were thinner and lighter than inactive babies who ate less but were fatter. Clydesdale remarked:

Excessive eating is not the case for the majority of (obese)... one of the best means available now to help obese children and also to help children who are at risk to develop obesity is to increase daily caloric expenditure through exercise. (p.9).

Summarizing research finding, Mayer (1976) concluded that lack

of exercise may well be the most important factor in the prevalence of obesity today. In high school girls, it was observed that inactivity was indeed a major factor in perpetrating obesity in most of the obese adolescents. Mayer (1976) classified two types of obese youngsters: (1) those who ate no more but exercised less than non-obese peers, and (2) those who ate more than non-obese peers but exercised normally. While participating in physical activities, the obese youngsters were observed by Bullen, Reed and Mayer (1970) to be inactive the majority of the time: in volleyball the obese were essentially motionless for 80 percent of the time as compared to 50 percent for the non-obese; in tennis the obese were inactive 60 percent of the time as compared to 20 percent for the non-obese; in swimming the obese tended to sit, stand or float for the majority of the time.

The relationship between fat tissue and muscle tissue was suggested by Roby to be an "inverse one because cessation of physical activity results in some muscle atrophy while at the same time creating a predisposition for fat accumulation" (p.158). Roby also remarked that the obese individuals are "less active than persons of normal weight , therefore the causation of obesity is not entirely due to abnormally high caloric intake" (p.158). Oscai concluded that the grossly overweight individual was indeed considerably less active than the normal weight individual and in the case of mild obesity "a decrease in exercise appears to be an important factor in weight gain leading to the grossly overweight condition" (p.119).

The lack of physical activity has been noted to be a critical factor in the lifestyle of the obese individual. (Bullen et al.; Clarke;

Clydesdale; Oscai; Roby;) The function of physical activity has often been misunderstood in relation to the effects on obesity-particularly in the area of caloric expenditure and appetite control (Mayer, 1976).

The Psychological Effects of Physical Activity on the Obese Individual

The beneficial psychological effects of physical activity suggest its application as a medium for therapy in the treatment and prevention of obesity (Collingwood & Willet, 1971; Leonardson, 1977; Lowen, 1975). In order to understand the possible psychological effects of a body awareness exercise program on body concept and self concept of inactive obese and non-obese women, it is necessary to review the literature involved in the following areas: (1) the psychological effects of physical activity on body concept and self concept and (2) the psychological effects of physical activity on body concept and self concept in obese individuals.

The psychological effects of physical activity on body concept and self concept. The psychological effects of physical activity on body concept and self concept have been well recognized by the psychiatrist, psychologist, dance therapist and movement therapist (Feder & Feder, 1977; Feldenkrais, 1972; Hecox, Levine and Scott, 1975; Lowen, 1975; Robbins and Robbins, 1972; Schutz, 1967; Weisbrod, 1972). Since it is not within the nature of the present study to expand in detail the evolution, refinement or evaluation of psycho-physical therapy per se, the reader is referred to Feldenkrais, Lowen (1969, 1975) and Schutz.

Dance therapy is unlike the standard mental-health therapies which rely mainly on verbal language in treatment. Feder and Feder described it as focusing on:

Body movement to diagnose as well as influence emotion and behavior...movement is not merely a manifestation of personality it is an integral part of it, as well as a major influence on a person's emotional states....focus is directly on physical change on the assumption that the mind and body are inextricably interwoven....improvement is usually direct and observable. (p.76)

In their dance therapy sessions for outpatients, Feder and Feder employed two basic techniques in treatment: (1) exercise periods to expand body awareness and perhaps make minor changes in musculature and (2) and folk dances which encourage body awareness and provide opportunity for easy non-threatening interaction." (p.76) As dance therapists, they employed body-alignment exercises to create physical balance by easing physical and therefore mental tensions, and body awareness exercises aimed at "isolating a person's tensions and analyzing how he moves" (p.76). By increasing an individual's movement repertoire, dance therapy was noted to aid in the definition of the boundaries of the physical self as well as help the patient "recognize the naturalness of the sensuality and enjoy the pleasure of physical experience" (p.80). Feder and Feder concluded:

With the growing recognition of the unity of mind and body, dance therapy, in conjunction with one or more of the existing psychotherapies, may well assume a prominent role in the mental health field (p.80).

In her discussion of shaping body image (body concept) through movement therapy, Weisbrod defined movement therapy and dance therapy as:

The planned use of any aspect of dance, movement and sensory experience to further the physical and psychic integration of the body.... Since movement is a fundamental dimension of human behavior it can be a mode for vital non-verbal communication (p.66).

Physical activity as a form of psycho-physiological therapeutic education is the basis of an Educational Rhythmic program used by Robbins and Robbins to affect body concept and self concept in individuals with mental and physical disabilities. They have observed:

Through the coordination of the components of space, time and movement, it creates a structured awareness of self concept in 'body image'. (p.53)

The effective experience may include gain in poise, self esteem, creativity, imagination, happiness in moving in unison with others, enjoyment of learning and doing, satisfaction of cooperating with others. (p.44)

Rhythmical movement and dance are appropriate physical activities to use as psycho-physical therapy for the improvement of body concept and self concept (Hecox et al.; Puretz, 1973). Hecox et al. defined the objectives of dance in physical rehabilitation as follows:

(1) to improve the individual's attitude towards himself, changing negative attitudes towards the body for what it can't do to pride in what it can do, (2) to provide an enjoyable outlet for the individual whose need of physical recreation is too often neglected, (3) to improve physical ability, (4) to improve the individual's functioning in his daily life, regardless of whether this reflects loss of self consciousness, increased confidence, other psychological-social improvements or physical improvement, (5) to provide the individual with the opportunity to experience movement and dance with and through one's own body.

The effects of modern educational dance on self concept were expanded upon by Puretz. She used the medium of movement to examine the

self in a non-threatening environment allowing the experiences which are inconsistent with the self concept to be perceived and assimilated, thus facilitating a more positive self concept. Modern educational dance was designed to affect the self concept through the use of the body:

The body can be viewed as the outward symbol of the self and in modern educational dance this outward symbol of the self is used as a means of expression. Not only must there be a development of body control and skill, which is a by-product of most physical activity, but also there must be a physical self-consciousness... those physical aspects perceived as characteristics of him and him alone, which can be controlled only by him which account for part of the self concept. The use of the body...emphasizes and reiterates the usefulness that the body possesses as a means of expression and as a projection of self. (p.11)

Studies investigating the use of physical activities, the level of physical fitness and their effects on body concept and self concept change have been undertaken by several researchers (Leonardson, 1977; McGowan, Jarman and Pederson, 1974; Sorenson, 1974; Tucker, 1975; Tyler, 1973). Studying the effects of a special strength training program on the self concept and peer approval of seventh grade boys, Sorensen observed a significant positive change in self concept (as evaluated by the Tennessee Self Concept Scale) related to changes in physical fitness level. The effect of physical achievement on self concept of high school boys in ability-grouped versus traditional physical education programs was studied by Tucker. Although there was no significant difference between the two programs, he found that the high ability boys were the most positive in self concept, suggesting that a boy's level of physical achievement influences his self concept primarily in those areas of his life where physical performance plays an integral role. Investigating the difference in social and sport self-

perception Tyler found that there was little difference in the perception between female varsity athletes and class participants of social self, but differences existed in sport self-perception. She also found that change in self-perceptions was evident over a sport season, particularly decreases in self confidence, achievement and dominance in unsuccessful participants. The effects of a competitive endurance training program on self concept and peer approval were investigated by McGowan et al. . They concluded that after an 18 week training period there was a significant increase in self concept (as measured by the Tennessee Self Concept Scale) in the treatment group but no significant difference in peer group approval. Studying the relationship between perceived physical fitness and self concept, Leonardson (1977) observed that perceived physical fitness and self concept were significantly but moderately correlated. He concluded that "physical fitness, determined on the basis of perceived or actual physical performance seems an important aspect of the construct of self concept" (p.62).

The psychological effects of physical activity on body concept and self concept of obese individuals. The psychological effects of physical activity on body concept and self concept of obese individuals has not been widely reported in the literature. The emphasis on research with obesity and physical activity has been directed to physiological changes in body composition, body fat loss and/or weight loss. The research involving obesity and the psychological factors of body concept and self concept has mainly concentrated on the diet approach to weight or fat loss and psychotherapy for reinforcing the dieting or the

assessment of psychological characteristics of obese individuals. Literature reviewing the use of physical activity as a form of therapy for the treatment of obesity on a psychological level appears to be limited. The effects of physical training upon the self concept and body attitude of obese adolescent males were investigated by Collingwood, and Willet (1971). Five male subjects were involved in a three week, two hour a day gym and swim program of sprints, calisthenics and endurance activities. The results indicated that:

Physical training provided a fairly concrete growth and success experience which gave the (subjects) positive feedback of themselves affecting their self attitude...significant increases (were found) in physical fitness performance, positive body attitude, positive self attitude, self-acceptance and significant decreases in real versus ideal self discrepancy. (412)

The Physiological Effects of Physical Activities on the Obese Individual

The beneficial physiological effects of physical activity also suggest its application as a medium for therapy in the treatment and prevention of obesity (Bray, 1976; Bjorntorp, 1973; Clarke; Foss, Lampman and Schteingart, 1973; Mayer, 1968, 1976; Oscai, 1973). In order to understand the possible physiological effects of a body awareness exercise program on body composition of inactive obese and non-obese women, it is necessary to review the literature in the area of physiological effects of physical activity on obese and non-obese individuals. Since the physiological affects of physical activity are reported to be similar for both obese and non-obese individuals, the effects will be inferred to both groups (Clarke; Oscai).

The physiological effects of physical activity have been well

researched by several exercise physiologists (Behnke & Wilmore, 1974; Clarke; Mayer, 1968; Oscai). Since it is not within the nature of the present study to expand upon or present new material in the area of energy metabolism and/or the physiological foundations of exercise per se, the reader is referred to Behnke and Wilmore; Bray (1976), Clarke, Mayer (1968) and Oscai.

The effects of physical activity on appetite, body growth and body composition were reviewed at length by Oscai. Emphasizing the popular misconception that regular physical activity increases appetite and food intake, he stated:

The belief that regular exercise consistently stimulates the appetite is not compatible with a number of carefully controlled studies conducted on human and experimental animals...vigorous exercise of (short) duration does not appear to stimulate the appetite. (p.105)

Regular sessions of physical activity were noted to have a favorable effect on body composition of children as well as adults. In children, regular physical activity lowered or prevented an increase in body fat tissue while increasing lean tissue. In adults, since body fat tends to increase with age and it is this increase in fat which causes an increase in adult weight, fat reduction through physical activity was noted to be an appropriate treatment for the control and/or prevention of adult-onset of obesity.

An interesting statement regarding the preference of physical activity over dietary means for the treatment of obesity was made by Oscai:

Large amounts of lean tissue in addition to fat are lost when the weight of an individual is reduced by means of caloric

reduction...one advantage of exercise over caloric restriction is that it provides considerable protection against the loss of protein and fat free weight associated with a negative caloric balance.(p.115)

The majority of the studies investigating the effects of physical activity on obese subjects mainly measured the change in body composition. The effects of a moderate eight week, five day a week walk-jog exercise program on 11 obese college women were studied by Moody, Kollias and Buskirk (1969). It was concluded that as a result of the program, a decrease in skinfold thickness indicated a decrease in total body fat. Zwiren (1970) also tested an eight week, one hour a day walk-jog exercise program which resulted in a significant decrease in percent body fat for the treatment group.

Glick and Kaufman (1976) observed that in thin, average and obese male subjects participating in a six week intensive army training program, skinfold thickness changes were not unilateral. Those in the thin category increased skinfold thickness whereas those in the average and obese categories decreased skinfold thickness.

Other types of physical activity programs were also used to study the effects of physical activity on body composition. Weight training programs used by Mayhew and Gross (1974) and Wilmore (1974) to study the effect of such a physical activity on body composition were found to produce a significant reduction in skinfold thickness.

The use of physical activity programs in the rehabilitation of extremely obese patients was advocated by Foss et al. . They concluded:

Although the importance of including some form of physical activity as a therapy in the rehabilitation program for

extremely obese patients has been acknowledged, there have been few efforts to devise a reasonable training program... (there is a) need to devise programs that are safe, practical and effective and will hold the interest of patients. (p.425)

Summary of the Review of Literature

The etiologic factors of obesity were reviewed in relationship to genetic, traumatic or environmental factors (Mayer, 1968) with the age of onset of the obese condition noted to be a critical factor in both the causes and effects of obesity (Stunkard & Burt, 1967).

Obesity by definition is the accumulation of excess fatty tissue (Oscai, 1973) and by such definition should be measured in terms of some technique which evaluates the proportion of body fat tissue to lean muscle tissue (Behnke & Wilmore, 1974). The most commonly accepted practical field measurement technique employed was the skinfold thickness measurement technique which uses calipers (Grande, 1973). A definitional misconception was observed in the area of obesity research. The overweight condition defined as the degree to which an individual exceeds the average weight for his age as determined by standard "height-weight" tables was often incorrectly considered synonymous with obesity which is defined in terms of percent body fat (Stuart, in press).

The general incidence of obesity was found to be difficult to assess due to the inconsistency in operational definition, instrumentation and methodology (Christakis, 1973). In the Framingham Study (Kannel & Gordon, 1974), incidences of obesity were noted to be higher in females than males.

Many psychological and physiological problems and conditions were noted in the obese individual particularly for the adolescent girl (Bruch, 1973a, 1973b; Dwyer & Mayer, 1968, 1973). The effects of obesity on physical appearance was observed to cause feelings ranging from inferiority, rejection and loneliness to disturbances in body concept, self disparagement and self hatred (Allon, 1973; Bruch, 1973a, 1973b; Dwyer & Mayer, 1968, 1973; Monello & Mayer, 1963; Stunkard & Mendelson, 1961, 1967). Dating behavior, marriage selection, and college acceptance appeared to be negatively influenced by obesity, placing the obese individual at a disadvantage with present social and cultural dictates. The negative effects of obesity on the physiological functions and structures of the body were also emphasized. Excess fat deposits placed excess strain on all systems and organs of the body, particularly in the respiratory and circulatory functions (Bray, 1976; Clarke, 1975; Oscai, 1973; Tomkin, 1975).

Obesity was perceived as an energy imbalance resulting from excessive caloric intake and/or insufficient caloric expenditure, therefore treatment involved methods to reverse these conditions (Oscai). Regulating diet was emphasized to decrease caloric intake (Kline et al., 1976). Increasing physical activity was employed to increase caloric expenditure (Bray, 1976; Clarke, Oscai).

The negative effects of obesity on body concept and self concept have been noted by several authors (Bruch, 1973a, 1973b; Dwyer & Mayer, 1973; Nathan, 1973; Stunkard & Mendelson, 1961, 1967). Body concept was noticeably affected by distortion of body size (Bailey et al. 1970;

Cappon & Bank, 1968; Glucksman & Hirsch, 1969; Hirsch, 1973) and disturbance in body concept (Nathan, 1973; Stunkard & Burt, 1967; Stunkard & Mendelson, 1961, 1967). Age of onset of obesity was noted to be a critical factor in the disturbance in body concept (Dwyer & Mayer, 1968, 1973; Hirsch; Monello & Mayer, 1963; Silverstone, 1973; Stunkard & Burt; Stunkard & Mendelson, 1961, 1967). The effects of obesity on body concept and self concept appeared to have the greatest effect on adolescents, particularly adolescent girls (Dwyer & Mayer, 1968, 1973; Hammer, 1975; Monello & Mayer). Super-obese individuals were noted to have more negative body cathexis than neurotics when evaluated by self figure-drawings but less negative self cathexis when evaluated by questionnaire (Gottsfeld, 1962). The validity of response on the questionnaire was questioned in that the response may have been a conscious attitude of perceiving oneself as closer to the ideal self than to the observed real self (Gottsfeld).

It was recommended that programs for obese individuals include some form of psychotherapy in order to overcome the negative effects of obesity on body concept and self concept (Gottsfeld; Stanley et al., 1970; Stoner & Fiorello, 1976). However, changes in body concept and self concept could not be expected to accompany a change in weight loss unless the program was designed to affect change in body concept and self concept as well (Stoner & Fiorello).

The beneficial effects of physical activity on the obese condition particularly on body composition of an individual, have been noted by several researchers (Bray, 1976; Clerke; Oscai). Regular sessions of physical activity were noted to have a favorable effect on body

composition, decreasing fat content and increasing lean muscle content (Oscari). Specific physical activity programs such as walking, walking-jogging, swimming, weight-lifting were found to significantly reduce skinfold thickness (Glick & Kaufman, 1976; Gwinup, 1975; May hew & Gross, 1974; Wilmore, 1974). Foss et al. (1976) advocated the importance of using physical activity in the rehabilitation of obese individuals, although few efforts had been made to specifically design physical activity programs for the inactive obese individual.

CHAPTER III

METHODS AND PROCEDURES

The primary purpose of this investigation was to compare the effects of a body awareness exercise program on the body concept, self concept and body composition of inactive obese and non-obese young women. A secondary purpose of this investigation was to determine to what extent there were relationships among body concept, self concept, body composition and body composition change in the inactive obese and non-obese young women.

Selection of Subjects

Subjects by definition were inactive, between the ages of 17 to 25 years, with a mean age of 18.6 years and selected from female volunteers living in Totem Park and Place Vanier student residences, University of British Columbia, Vancouver, British Columbia. All subjects were categorized according to body composition (obese or non-obese) then assigned to a treatment or control group. Due to difficulty in obtaining obese subjects, random assignment of subjects was not totally possible. Both treatment and control groups consisted of 25 subjects: 10 obese and 15 non-obese subjects. In total, 50 subjects took part in the study.

Organization of Time, Space and Personnel

The screening of volunteers was conducted from January 10 to January 29, 1977, during which time subjects were accepted, assessed for percent body fat, body concept and self concept, then assigned to a treatment or control group. The treatment group consisted of 12 obese

and 18 non-obese subjects; the control group consisted of 11 obese and 15 non-obese subjects. In total, pretest evaluation was completed for 56 subjects. The body awareness exercise program (see Appendix D) began the week of January 31, 1977 in both residences for the treatment group. Half-hour exercise sessions were held eight times a week in Haida House lounge at Totem Park Residence and six times a week in Tweedsmuir House lounge at Place Vanier Residence for a period of 10 weeks. Subjects were required to attend at least three half-hour sessions a week. The average total attendance for the obese group was 33 sessions, for the non-obese group was 32 sessions. For the control group, the pretest date of each individual was considered as the beginning of the 10 week test period. Subjects in the control group were asked to continue their same lifestyle without going on a diet or increasing their activity.

Posttesting began March 28, 1977, and was completed by April 16, 1977. The treatment group was re-evaluated after the tenth week of the exercise program. Two obese and three non-obese subjects failed to complete the program. Posttest evaluation was completed for 10 obese and 15 non-obese treatment subjects. The control group was re-evaluated individually 10 weeks after the pretest date of each subject. One obese subject in the control group was not available for posttest evaluation. Posttest evaluation was completed for 10 obese and 15 non-obese control subjects.

Body Awareness Exercise Program

The body awareness exercise program employed in the study was designed to specifically develop and/or improve body awareness through

the use of rhythmical movement. Based on the isolation technique (Mishlin & Schill, 1973) of learning and producing movement, the method was as follows: (1) specific joints or sets of joints were isolated, (2) the remaining parts of the body were relaxed and used only for support and balance, (3) muscle action pertaining to that specific isolated joint or joints was explored and practiced. Each exercise session required half an hour to complete, with each movement being repeated eight times to recorded 2/4 and 4/4 rhythms (see Appendix D).

Instrumentation

The Body Cathexis Scale, Self Cathexis Scale (Secord & Jourard, 1953) and the Tennessee Self Concept Scale (Fitts, 1965) were administered at the pretest and posttest sessions by the investigator. Since written instructions accompanied each scale, subjects completed the scales with minimal instructions from the investigator. All skinfold measures were taken by the investigator according to the Yuhasz (1973) method. Two assistants aided in recording and calculating data.

The Body Cathexis Scale, Self Cathexis Scale and the Tennessee Self Concept Scale were chosen from evaluation instruments for body concept and self concept because of ease of administration and interpretation. The Body Cathexis and Self Cathexis Scales were recommended to the investigator by Stuart (1976) for use with obese subjects. The Tennessee Self Concept Scale was chosen because the scale had been employed in several studies concerning self concept and physical activity (McGowan, Jarman and Pederson (1974); Sorenson (1974)). Two separate scales were chosen to evaluate body and self concept because of the individual design

of each scale and common scoring system. The Body Cathexis and Self Cathexis Scales were based on items consisting of one word and were more specific in nature. The Tennessee Self Concept Scale was based on items consisting of sentence statements and was more general in nature. A second reason the Self Cathexis Scale and the Tennessee Self Concept Scale were chosen for use as self concept measures was the fact that they had an accompanying body concept measure with a similar design.

Body Cathexis Scale and Self Cathexis Scale

The Body Cathexis Scale consisted of a listing of 46 body parts and functions; the Self Cathexis Scale consisted of a listing of 55 items believed to represent a sampling of various aspects of the self (Secord & Jourard). Both scales were rated on a five point scale (see Appendix C). Means, standard deviations and reliability coefficients are presented in Table 1 (Secord & Jourard).

Table 1
Means, Standard Deviations and Reliability Coefficients
for Body Cathexis Scale and Self Cathexis Scale

Score	Mean	Standard Deviation	Reliability Coefficient
Body Cathexis	3.46	0.401	0.83
Self Cathexis	3.35	0.510	0.92

The intercorrelation between Body Cathexis and Self Cathexis was reported to be $r = 0.66$ (Secord & Jourard).

Tennessee Self Concept Scale

The Tennessee Self Concept Scale was a self-evaluation questionnaire, consisting of 100 self-descriptive statements, to which the subject responded on a five point scale. The scale is designed in such a manner that statements representing both internal and external forms of reference are included (Fitts). Total Self score and Physical Self score as obtained from the Counselling form of the Tennessee Self Concept Scale were employed in the study.

Norms for the Tennessee Self Concept Scale were established from a standardized population of 626 subjects. Means, standard deviations, and test-retest coefficients are presented in Table 2 (Fitts).

Table 2
Means, Standard Deviations and Reliability Coefficients
for Tennessee Self Concept Scale

Score	Mean	Standard Deviation	Reliability Coefficient
Total Self Concept score	345.57	30.70	0.92
Physical Self score	71.78	7.67	0.87

Skinfold Measure

The Harpenden skinfold calipers were used to assess the amount of body fat. Measures were taken according to the Yuhasz (1973) technique at the following sites: triceps, subscapular, abdominal, suprailiac, front thigh, and rear thigh (see Appendix B). Three series of measures were taken and the average score was recorded in order to reduce variability. The investigator had established a personal test-retest reliability score of .99 for each site before starting the study (see Appendix E).

Experimental Design

The experimental design employed in the study was a 2 X 2 X 2 factorial design with repeated measures on the last factor. The independent variables in the study were: (1) group, (2) body composition, (3) time (see Figure 1).

GROUP	BODY COMPOSITION	TIME
Treatment	obese	pretest posttest
	non-obese	pretest posttest
Control	obese	pretest posttest
	non-obese	pretest posttest

Figure 1

Experimental Design of Study

The dependent variables in the study were:

- (1) Body Concept Scores:
 - (a) Body Cathexis Score
 - (b) Physical Self Score from Tennessee Self Concept Scale.
- (2) Self Concept Scores:
 - (a) Self Cathexis Score
 - (b) Total Self Concept Score from Tennessee Self Concept Scale.
- (3) Body Composition Score:
 - (a) Percent Body Fat Score obtained from Yuhasz method

Analysis of Data

An extensive error-checking computer program, DATASNIFF (Goodman & Schutz, 1976) was used to evaluate the data for erroneous values above or below a specified acceptable minimum or maximum value and to compute means, standard deviations, and correlations for all dependent variables.

A three-way analysis of variance using the BMD:P2V (Dixon, 1975) computer program was applied to the data to test Hypotheses One, Two and Three for program effect on body concept, self concept and body composition respectively as indicated by the 'Group X Time' interactions. A pre-planned orthogonal contrast was applied to the data to test Hypothesis Four, comparing body concept in obese and non-obese subjects. Pearson Product Moment correlation coefficients were calculated to test Hypothesis Five to indicate whether a relationship existed between body concept change and body composition change in the obese treatment subjects. A correlation matrix as obtained from the DATASNIFF program was applied to data of all dependent variables to answer the subproblem which asked to what extent relationships existed among body concept, self concept, body composition, and body composition change.

CHAPTER IV

RESULTS AND DISCUSSIONS

The effects of a body awareness exercise program on body concept, self concept and body composition of inactive obese and non-obese young women were assessed on a sample of 50 subjects. Pretest and posttest data were completed for 10 obese and 15 non-obese subjects in both the treatment and control group. Body concept was evaluated using the Body Cathexis Scale (Secord & Jourard, 1953) and Physical Self Score from the Tennessee Self Concept Scale (Fitts, 1965). Self concept was evaluated using the Self Cathexis Scale (Secord & Jourard) and the Total Self Concept Score from the Tennessee Self Concept Scale (Fitts). Body composition was evaluated using the Yuhasz (1973) method to determine Percent Body Fat. An increase in body concept and self concept scores indicated a positive change in psychological assessment; a decrease in body fat indicated a positive change in physiological assessment.

The results and discussions of the data analyses are divided into two sections. The first section deals with the main problem - the effects of the body awareness exercise program on the body concept, self concept and body composition of inactive obese and non-obese young women. The second section deals with the sub-problem - the relationships among body concept, self concept, body composition and body composition change of inactive obese and non-obese young women. The means and standard deviations for all dependent variables are compiled in Tables 21, 22 and 23 in Appendix G.

MAIN PROBLEM : PROGRAM EFFECTS ON BODY CONCEPT, SELF CONCEPT AND
BODY COMPOSITION OF INACTIVE OBESE AND NON-OBESE
YOUNG WOMEN.

The effects of the body awareness exercise program on body concept and self concept are tested by Hypotheses One and Two respectively. The results are presented separately but are discussed together since body concept was evaluated as a component of self concept in the instruments used. The effects of the body awareness exercise program on body composition are tested by Hypothesis Three.

The statistical treatment employed to test Hypotheses One, Two and Three was the ANOVA. Testing was conducted for a significant difference between groups which could be attributed to treatment effects as indicated by the 'Treatment X Time' interactions. Sources for the ANOVA are defined as follows:

Treatment: Body awareness exercise program group vs control group,

Size: Obese vs non-obese body composition,

Time: Pretest evaluation vs posttest evaluation.

Hypothesis One: The Use of a Body Awareness Exercise Program Causes a Positive Change in the Body Concept of Inactive Obese and Non-obese Young Women

Results. Body concept was evaluated by two scores: (1) Body Cathexis and (2) Physical Self. The results for each score are presented separately.

Program effects on the Body Cathexis scores are represented by: (1) Table 3 which lists mean scores for the pretest and posttest results, (2) Figure 2 which illustrates in graphic form the mean scores obtained from Table 3 and (3) Table 4 which indicates the results of the ANOVA for Body Cathexis. The exercise program did not have a significant effect on Body Cathexis ($p=.61$ for the Treatment by Time interaction). A highly significant time effect ($p<.01$) was observed for the total sample on the Body Cathexis score (see Table 4).

Table 3
Mean Scores for Body Cathexis

	Pre	Post
Treatment		
Obese	3.00	3.29
Non-obese	3.20	3.50
Combined	3.08	3.40
Control		
Obese	2.99	3.36
Non-obese	3.20	3.30
Combined	3.07	3.32

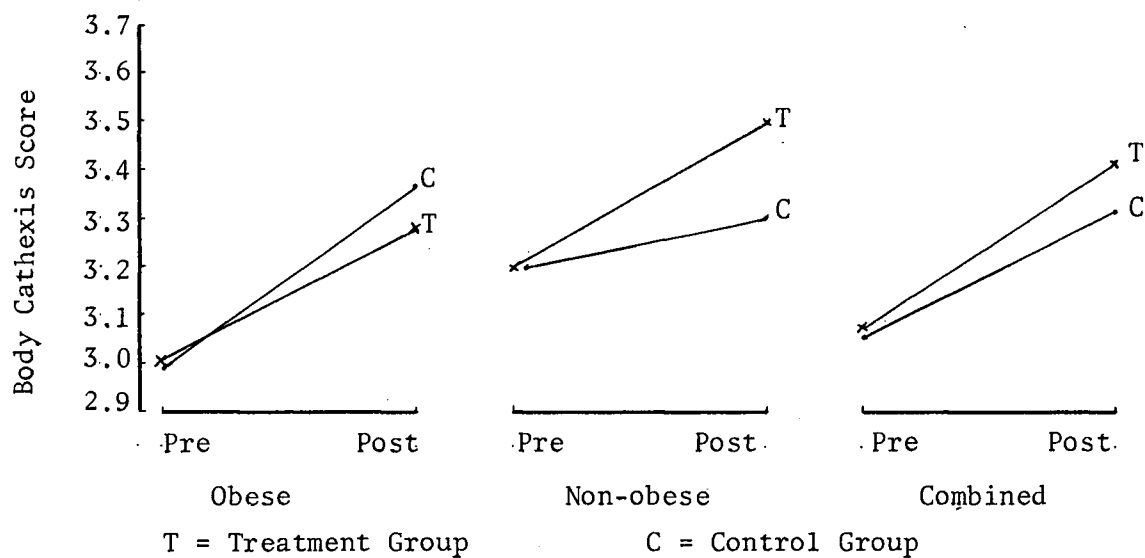


Figure 2 Program Effect on Body Cathexis Score

Table 4
Summary of ANOVA for Body Cathexis

Source	df	Mean Square	F	p
Treatment	1	0.020	0.087	0.77
Size	1	0.499	2.221	0.14
Treatment by Size	1	0.096	0.425	0.52
Error	46	0.225		
Time	1	1.716	24.372	<.01
Time by Treatment	1	0.018	0.260	0.61
Time by Size	1	0.096	1.356	0.25
Time by Treatment by Size	1	0.105	1.488	0.23
Error	46	0.070		

Program effect on the Physical Self scores are represented by:

(1) Table 5 which lists mean scores for the pretest and posttest results, (2) Figure 3 which illustrates in graphic form the mean scores obtained from Table 5 and (3) Table 6 which indicates the results of the ANOVA for Physical Self. The exercise program had a positive effect on Physical Self as the Treatment group showed a three unit improvement over the program duration whereas the control group showed a slight decline of 0.6 units. This effect, the Treatment by Time interaction, approached significance ($p = .07$). There was no significant time effect ($p = .18$) observed for the total sample on the Physical Self score (see Table 6).

Table 5

Mean Scores for Physical Self

	Pre	Post
Treatment		
Obese	59.1	63.7
Non-obese	63.0	66.7
Combined	61.8	64.8
Control		
Obese	62.8	62.8
Non-obese	62.9	62.0
Combined	62.9	62.3

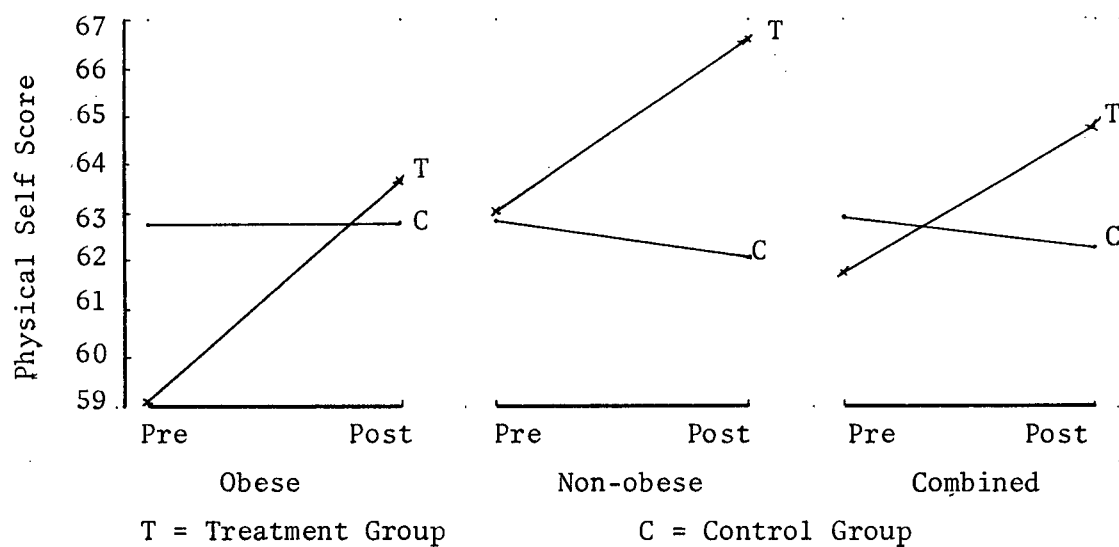


Figure 3 Program Effect on Physical Self Score

Table 6
Summary of ANOVA for Physical Self

Source	df	Mean Square	F	p
Treatment	1	1.398	0.014	0.91
Size	1	111.813	1.106	0.30
Treatment by Size	1	149.000	1.474	0.23
Error	46	101.063		
Time	1	38.002	1.816	0.18
Time by Treatment	1	71.414	3.414	0.07
Time by Size	1	0.882	0.042	0.84
Time by Treatment by Size	1	1.815	0.087	0.77
Error	46	20.921		

Hypothesis Two: The Use of a Body Awareness Exercise Program Causes
a Positive Change in the Self Concept of Inactive Obese and Non-obese
Young Women

Results. Self concept was evaluated by two scores: (1) Self Cathexis and (2) Total Self Concept. The results for each score are presented separately.

Program effects of the Self Concept scores are represented by:

(1) Table 7 which lists mean scores for the pretest and posttest results,
(2) Figure 4 which illustrates in graphic form the mean scores as obtained from Table 7 and (3) Table 8 which indicates the results of the ANOVA for Self Cathexis. The exercise program did not have a significant effect on Self Cathexis ($p=.18$ for the Treatment by Time interaction) for the combined treatment group. However, as observed in Table 7 and Figure 4, a difference was noted between the pretest and posttest scores of the non-obese treatment and control subjects. A time effect which approached significance ($p = .06$) was observed for the total sample on the Self Cathexis scores (See Table 8).

Table 7
Mean Scores for Self Cathexis

	Pre	Post
Treatment		
Obese	3.31	3.50
Non-obese	3.33	3.62
Combined	3.32	3.57
Control		
Obese	3.23	3.44
Non-obese	3.51	3.38
Combined	3.40	3.40

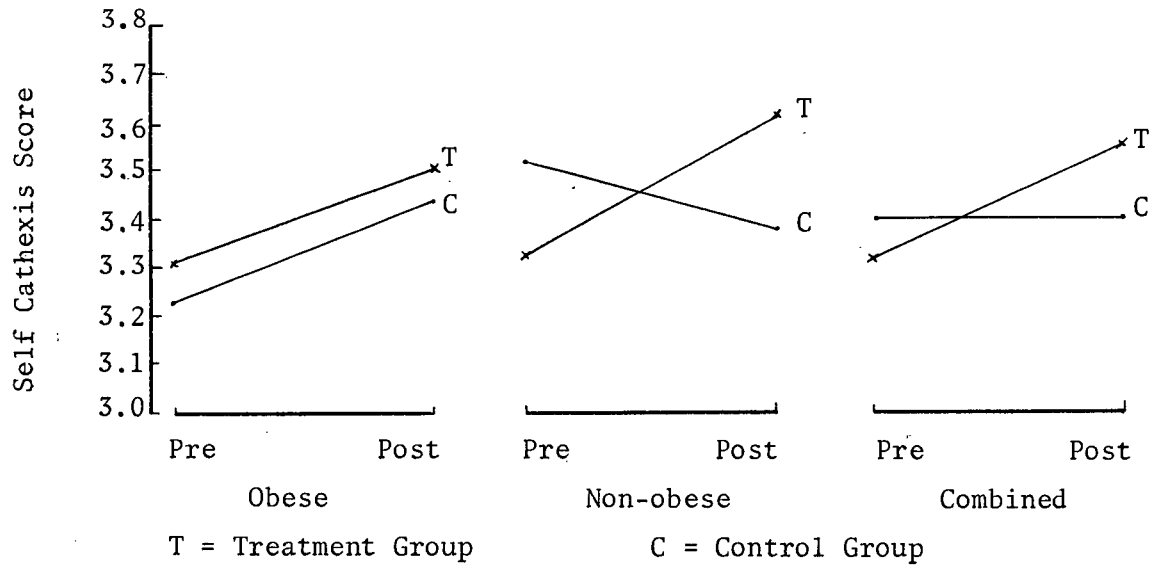


Figure 4 Program Effect on Self Cathexis Score

Table 8
Summary of ANOVA for Self Cathexis

Source	df	Mean Square	F	p
Treatment	1	0.053	0.145	0.71
Size	1	0.184	0.510	0.48
Treatment by Size	1	0.008	0.022	0.88
Error	46	0.368		
Time	1	0.490	3.800	0.06
Time by Treatment	1	0.244	1.894	0.18
Time by Size	1	0.079	0.617	0.44
Time by Treatment by Size	1	0.282	2.186	0.15
Error	46	0.129		

Program effects on the Total Self Concept scores are represented by: (1) Table 9 which lists mean scores for the pretest and posttest results, (2) Figure 5 which illustrates in graphic form the mean scores as obtained from Table 9 and (3) Table 10 which indicates the results of the ANOVA for Total Self Concept. The treatment group exhibited a considerably greater change in Total Self Concept than did the control group ($p=.06$ for the Treatment by Time interaction). However, as observed in Table 9 and Figure 5, a difference was noted between the posttest scores of the obese and non-obese subjects in the treatment group indicating that the significant change was obtained from the non-obese subjects' change rather than obese subjects' change. There was a non-significant time effect ($p=.68$) observed for the total sample on the Total Self Concept score (see Table 10).

Table 9
Mean Scores for Total Self Concept

	Pre	Post
Treatment		
Obese	330.0	330.7
Non-obese	338.0	347.7
Combined	334.8	340.9
Control		
Obese	334.3	330.1
Non-obese	333.8	332.1
Combined	334.0	331.3

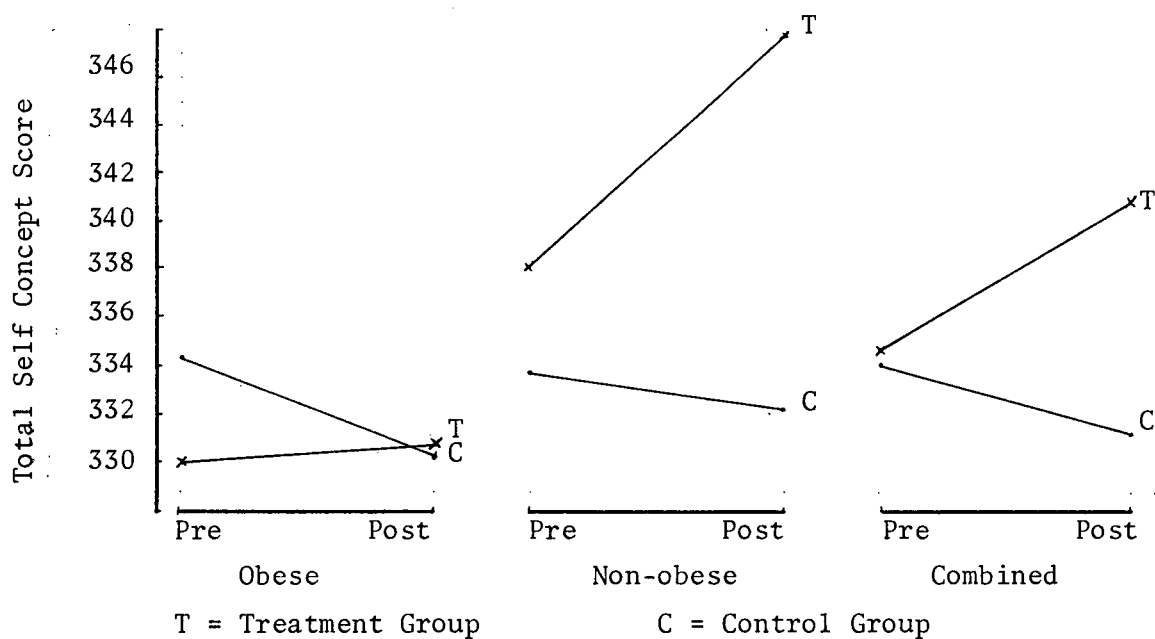


Figure 5 Program Effect on Total Self Concept Score

Table 10
Summary of ANOVA for Total Self Concept

Source	df	Mean Square	F	p
Treatment	1	55.750	0.029	0.86
Size	1	405.313	0.214	0.65
Treatment by Size	1	1683.375	0.890	0.35
Error	46	1892.096		
Time	1	46.480	0.170	0.68
Time by Treatment	1	1037.521	3.786	0.06
Time by Size	1	689.074	2.514	0.12
Time by Treatment by Size	1	18.371	0.067	0.88
Error	46	274.062		

Hypotheses One and Two: The Use of a Body Awareness Exercise Program Causes a Positive Change in the Body Concept and Self Concept of Inactive Obese and Non-obese Young Women.

Discussion. Hypotheses One and Two stated the use of a body awareness exercise program causes a positive change in the body concept and self concept of inactive obese and non-obese young women. Based on the results, Hypotheses One and Two were not accepted since the exercise program did not have a significant effect on body concept or self concept; however, it must be noted the exercise program had a positive effect which approached significance on Physical Self ($p = .07$) and on Total Self Concept ($p = .06$). A highly significant time effect was noted for the Body Cathexis scores ($p < .01$), with Self Cathexis scores also showing a near significant change over time ($p = .06$); however, the treatment effect was not significant since the control group improved over time as well as the treatment group.

The non-acceptance of Hypotheses One and Two is inconsistent with the research cited in the literature, although the near significant results for Physical Self and Total Self Concept scores lend support to the cited research. Collingwood and Willet (1971) noted a significant increase in positive body attitude, self attitude and self acceptance. McGowan, Jarman and Pederson (1974) concluded after a physical training program, there was a significant increase in self concept (as measured by the Tennessee Self Concept Scale). Sorenson (1974) observed a significant increase in self concept (as measured by the Tennessee Self Concept Scale) after participation in a strength training

program. Improvement in body concept and self concept is one of the major principles and objectives of dance and movement therapy as expressed by Feder and Feder (1977), Hecox, Lavine and Scott (1975) and Robbins and Robbins (1972).

The results indicating a program effect on body concept and self concept appeared to be influenced by three factors: (1) time, (2) design of instruments and (3) timing of posttest evaluation session.

The time effect was noted to be significant for the Body Cathexis score and considered to be near significant for the Self Cathexis score. There was no significant time effect for the Physical Self or Total Self Concept scores. This may be explained in terms of the second factor, design of instruments. The Body Cathexis and Self Cathexis Scales are constructed of specific one word items whereas the Physical Self and Total Self Concept scores taken from the Tennessee Self Concept Scale are constructed of general sentence statements. It appeared the specific evaluations of Body Cathexis and Self Cathexis were more directly affected by time than were the general evaluations of Physical Self and Total Self Concept. This difference in the effect of time on the specific and general evaluation of body and self concept could explain the lack of significant effect on Body and Self Cathexis, while the effect on Physical Self and Total Self Concept scores approached significance.

The third factor which may have affected the degree of program effect on body and self concept was the timing of the posttest evaluation session which coincided with the last week of university

classes before final exams. Pressures and tensions resulting from this pre-exam academic situation could very well have influenced the subjects' body and self concept, modifying any positive effects experienced from participation in the exercise program. Several girls mentioned going on pre-exam eating sessions and feeling guilty because they were in the exercise program and their extra eating might be observed in their posttest skinfold measures. During the last week of classes, many of the girls received grades for term papers and laboratory exams which may have had an effect on the academic aspect of self concept.

Hypothesis Three: The Use of a Body Awareness Exercise Program Causes Body Composition Change in Inactive Obese and Non-obese Young Women

Results. Program effects on body composition scores are represented by: (1) Table 11 which lists the mean score for the pretest and posttest results, (2) Figure 6 which illustrates in graphic form the mean scores as obtained from Table 11 and (3) Table 12 which indicates the results of the ANOVA for Percent Body Fat. The exercise program group decreased significantly in Percent Body Fat ($p=.01$ for the Treatment by Time interaction) (See Table 12).

Table 11
Mean Scores for Percent Body Fat

	Pre	Post
Treatment		
Obese	27.8	26.1
Non-obese	18.7	17.7
Combined	22.4	21.2
Control		
Obese	28.4	28.9
Non-obese	17.0	17.7
Combined	21.1	22.2

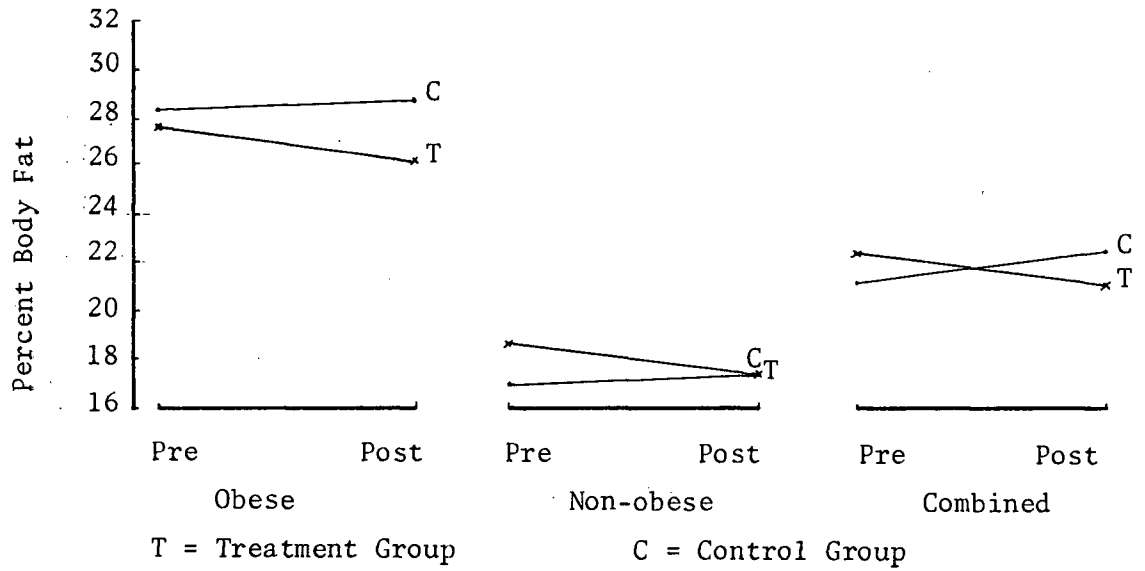


Figure 6 Program Effect on Percent Body Fat Score

Table 12
Summary of ANOVA for Percent Body Fat

Source	df	Mean Square	F	p
Treatment	1	3.921	0.111	0.74
Size	1	2418.767	68.651	0.00
Treatment by Size	1	39.990	1.135	0.29
Error	46	35.233		
Time	1	3.212	0.936	0.34
Time by Treatment	1	22.698	6.616	0.01
Time by Size	1	1.612	0.470	0.50
Time by Treatment by Size	1	0.304	0.089	0.77
Error	46	3.431		

Discussion. Hypothesis Three stated that the use of a body awareness exercise program causes body composition change in inactive obese and non-obese young women. Based on the results, Hypothesis Three was accepted since the exercise program had a significant effect on body composition ($p = .01$). The acceptance of Hypothesis Three is consistent with the research which stated that exercise caused a decrease in body fat cited in the literature by Glick and Kaufman (1976), Mayhew and Gross (1974), Moody, Kollias, and Buskirk (1969), Wilmore (1974) and Zwiran (1970). All found significant decreases in skinfold thickness as a result of physical activity, which is in accordance with the physiological effects of physical activity on body composition as noted by Behnke and Wilmore (1974), Clarke (1975) and Oscai (1973).

Main Problem: Summary of Program Effect on Body Concept, Self Concept and Body Composition

The main problem of this investigation was to study the effects of a body awareness exercise program on the body concept, self concept and body composition of inactive obese and non-obese young women. It was hypothesized that the exercise program causes a positive change in body concept and self concept as tested by Hypotheses One and Two respectively. A positive change which approached significance was observed in the Physical Self and Total Self Concept scores; however, a non-significant positive change was observed in Body Cathexis and Self Cathexis scores. Therefore, Hypotheses One and Two could not be accepted.

It was stated in Hypothesis Three that a body awareness exercise program causes body composition change. It was found that a similar decrease in Percent Body Fat for both obese and non-obese treatment subjects resulted in a significant positive change in body composition. Therefore, Hypothesis Three was accepted.

Based on the results of the data analyses, the body awareness exercise program:

1. caused a positive change which approached significance in body concept and self concept with inferences delimited to the results obtained from the Tennessee Self Concept Scale;
2. did not cause a significant positive change in body concept and self concept with inferences delimited to the results obtained from the Body Cathexis and Self Cathexis Scales;
3. caused a significant positive change in body composition in both obese and non-obese subjects.

Participation in the body awareness exercise program resulted in a significant reduction in Percent Body Fat in both obese and non-obese subjects. Therefore, it may be concluded that this type of exercise program is a potentially effective and appropriate form of physical activity to use with inactive obese and non-obese young women. It may be speculated that since the body awareness exercise program resulted in positive changes which approached significance in body concept and self concept (as delimited) this type of exercise program may be effective in improving body and self concept in inactive obese and non-obese young women. Since participation in the exercise program resulted in a positive change in body and self concept, it may also

be speculated that the positive effect may encourage continued participation in physical activity with the accompanying decrease in body fat.

SUBPROBLEM: RELATIONSHIPS AMONG BODY CONCEPT, SELF CONCEPT, BODY COMPOSITION AND BODY COMPOSITION CHANGE IN INACTIVE OBESE AND NON-OBESE YOUNG WOMEN

The relationships among body concept, self concept and body composition in inactive obese and non-obese young women were examined using the correlation matrix on pretest scores for all dependent variables. The relationship between body concept and body composition as tested by Hypothesis Four and the relationship between body concept change and body composition change as tested by Hypothesis Five are presented and discussed separately.

Relationships Among Body Concept, Self Concept and Body Composition

The expected differences in all dependent psychological variable means between obese and non-obese subjects as indicated by Tables 21, 22 and 23 (see Appendix G) did not materialize. Significant differences were not obtained between the obese and the non-obese subjects' scores. A difference in mean scores occurred between the sample means and the norms for the specific measurement scales which was unexpected since the norms were established from populations including the sample population's characteristics. In comparing the means obtained from the present study with the norms for the individual scales, it was noted that both obese and non-obese subjects obtained means below the scale norms for Body Cathexis, Physical Self and Total Self Concept. Since inactivity was a common characteristic in both obese and non-obese subjects, it would

appear that inactivity was more influential than body composition differences in contributing to lower mean scores. Body composition did not appear to differentiate means between obese and non-obese subjects in Body Cathexis, Physical Self, Self Cathexis and Total Self Concept.

Results. The correlation matrix for all dependent variables as obtained on the pretest evaluation is represented in Table 13. No significant relationships existed among body concept, self concept and body composition.

Table 13
Correlation Coefficients Between Percent
Body Fat and Body Concept, Self Concept

	Treatment		Control	
	Obese	Non-obese	Obese	Non-obese
Body Cathexis	0.418	-0.016	0.363	0.008
Physical Self	-0.155	-0.195	-0.402	-0.079
Self Cathexis	0.340	-0.055	0.152	-0.141
Total Self Concept	0.179	-0.158	-0.346	-0.075
<div> Obese : $r_{.05,8} = 0.634$ Non-obese : $r_{.05,13} = 0.514$ </div>				

Discussion. It was expected that there would be a significant relationship between body composition and body concept as well as between body composition and self concept since obesity was noted to be negatively related to body concept and self concept particularly in the area of body size distortion and body concept disturbance (Monello & Mayer, 1963; Stunkard & Mendelson, 1961, 1967). However, this did not occur, therefore there may have been other factors involved in this study that were more influential than body composition which resulted in the lack of relationships with body concept and self concept. Stunkard and Mendelson (1967) stated that the presence of emotional disturbances and negative evaluation of the obese condition by significant others were important factors in predisposing body concept disturbances. It is possible that the backgrounds of the obese volunteer subjects were such that other areas of Total Self Concept in addition to Physical Self modified any negative effect of the obese condition. Since the volunteer subjects were university students, it may be possible that academic performance was more important than physical appearance, therefore having a stronger influence on the perception of self. It was possible that factors other than body composition were more highly correlated to body concept and self concept in the total sample of young university women.

Hypothesis Four: Inactive Obese Young Women Have a Lower Body Concept Than Inactive Non-obese Young Women

Results. The results of the pre-planned orthogonal comparison indicated that there was no significant difference in body concept between obese and non-obese subjects (Body Cathexis: $t = .77$, $p > .10$; Physical Self: $t = .42$, $p > .10$).

Discussion. Hypothesis Four stated that inactive obese young women have a lower body concept than inactive non-obese young women. Since there was no significant difference in body concept between obese and non-obese subjects ($p > .10$) Hypothesis Four could not be accepted.

The non-acceptance of Hypothesis Four is inconsistent with research cited in the literature. The lack of difference between obese and non-obese subjects was not expected since it was noted by several authors that obesity was often related to negative effects on body concept such as distortion of body size and disturbance of body concept (Stunkard & Burt, 1967; Stunkard & Mendelson, 1961, 1967). This lack of difference could have been influenced by three factors:

(1) the characteristics of the obese individual who volunteered to be a subject, (2) the validity of the subjects' response to the questionnaires and (3) the common characteristic of inactivity.

The first factor which could have been responsible for the noted lack of difference was the characteristic of the obese individual who volunteered to be a subject. According to Stunkard and Mendelson (1961, 1967) and Nathan (1973), the juvenile age of onset of obesity is a critical factor in the disturbance of body concept. Since the volunteers in the present study were within the age range of 17 to 25 years with a mean age of 18.6 years, it is possible that only those obese individuals without body concept disturbance and negative self concepts volunteered. This is a very real possibility since the investigator experienced great difficulty in recruiting obese subjects for the study. In fact only 20 inactive obese girls could be found who

would volunteer to be subjects and some would only be in the control group, not the treatment group. There was no difficulty in recruiting non-obese volunteers for subjects. It is possible that those obese individuals with negative body concepts and self concepts did not volunteer to participate in the study because their negative feelings about their bodies and themselves in general prevented them from volunteering.

The validity of the subjects' response to the questionnaires could have been influential in causing a lack of difference in body concept between obese and non-obese subjects. Gottsfeld (1962) noted a conflict in results when assessing obese subjects with neurotic subjects for body cathexis (using self figure-drawings) and self cathexis (using a questionnaire). The obese subjects showed the most negative body cathexis yet the least negative self cathexis. He suggested that the self figure-drawing represented the unconscious aspects of attitude whereas the self descriptive questionnaire represented a more conscious level of attitude. Gottsfeld concluded that the obese individual was "unable to accept a negative self description of himself and on the conscious level portrays himself as well satisfied" (p.37). His comparisons of observed behavior and self-reported behavior disclosed a disparity in perceptions. The obese rated themselves closer to their ideal self than to their observed real self. It is possible that in the present study, the obese subjects rated themselves closer to their ideal self which would approximate the non-obese identity than to their real self which would have shown a more negative body concept as noted by Gottsfeld.

The common characteristic of inactivity could have been the third factor involved in the lack of differentiation in body concept between obese and non-obese subjects. Body concept means for both the obese and non-obese subjects were below the norm for the Body Cathexis and Physical Self scales. It is possible that the feelings about the body's ability to perform motor skills and its level of physical fitness could be more closely related to body concept than is physical size and appearance. Tucker (1975) observed that high ability boys were more positive in self concept than low ability boys. Tyler (1973) found that changes in self perception were evident over time, particularly decreases in self concept and achievement in unsuccessful participants. Sorensen (1974) showed that a significant change in self concept was related to positive changes in physical fitness. Leonardson (1977) observed that perceived physical fitness was significantly related to self concept. It is possible that the inactivity factor modified any differences between obese and non-obese subjects which were related to body composition, thus resulting in a lack of difference between inactive obese and non-obese subjects for the dependent variable of body concept.

Hypothesis Five: In Inactive Obese Young Women, the Degree of Change in Body Concept is Proportional to the Amount of Change in Body Composition Over a Ten Week Body Awareness Exercise Program

Results. Body Cathexis, Physical Self and Percent Body Fat change scores as obtained by subtracting pretest scores from posttest scores are listed in Table 14. The correlation coefficients as calculated

indicate that a significant correlation did not exist between Body Cathexis change scores and Percent Body Fat change scores ($r = -.15, p > .10$), or between Physical Self change scores and Percent Body Fat change scores ($r = -.14, p > .10$). A change in body concept was associated with a change in body composition; that is, within the 80 percent of the subjects who experienced a decrease in Percent Body Fat, 88 percent of these subjects experienced an increase in Body-Cathexis and 63 percent of these same subjects experienced an increase in Physical Self (see Figures 7 and 8).

Table 14
Body Concept Change Scores and Body Composition
Change Scores in Obese Treatment Subjects

Subject	Body Cathexis Change Score	Physical Self Change Score	Percent Body Fat Change Score
1	+ .30	+ 7.0	- 1.9
2	+ .30	+ 6.0	- 3.9
3	+ .22	+ 4.0	+ 1.6
4	+ .48	+ 2.0	- 3.6
5	= .19	- 2.0	- 2.7
6	+ .73	- 3.0	- 2.0
7	- .30	- 2.0	+ 2.0
8	+ .27	+ 11.0	- 3.4
9	+ .11	- 2.0	- 2.5
10	+ 1.06	+ 8.0	- 1.7

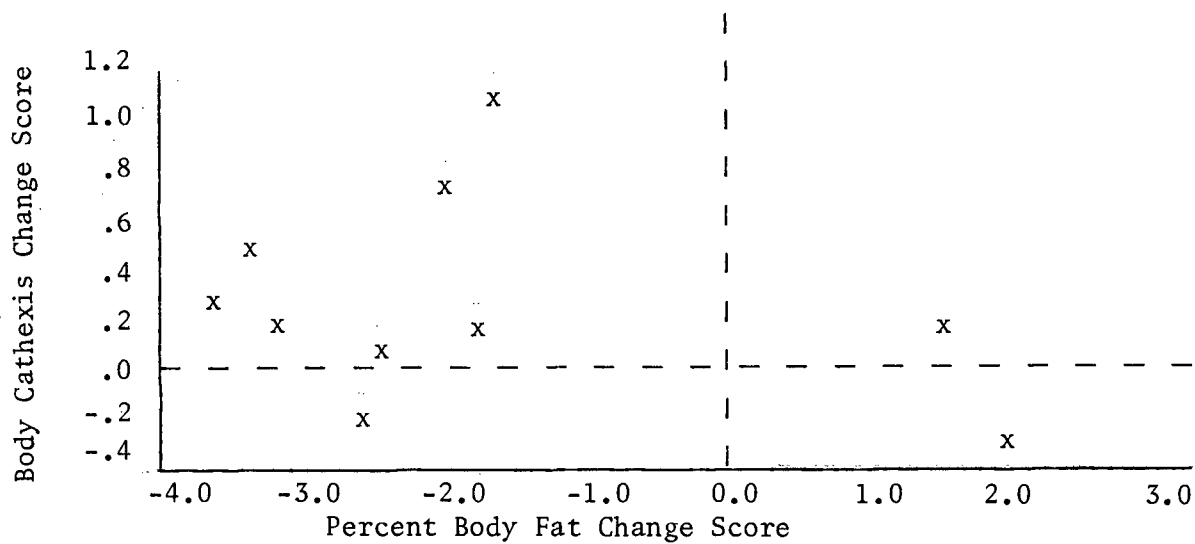


Figure 7 Relationship Between Body Cathexis Change Score and Body Composition Change Score

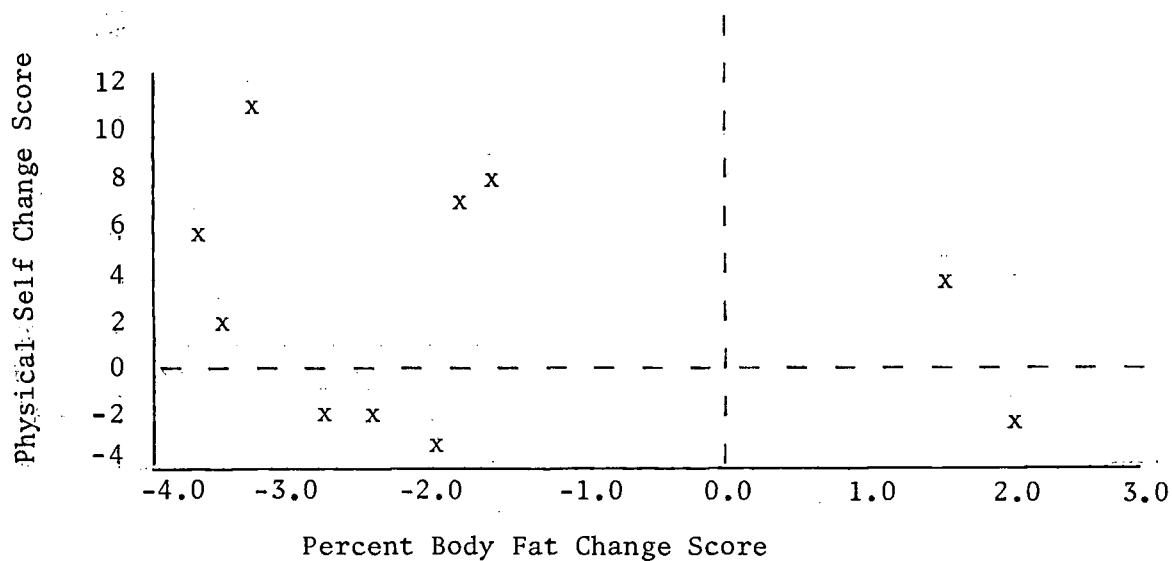


Figure 8 Relationship Between Physical Self Change Score and Body Composition Change Score

Discussion. Hypothesis Five stated that in inactive obese young women, the degree of change in body concept would be proportional to the amount of change in body composition over a 10 week body awareness exercise program. Since a significant correlation did not exist between body concept change and body composition change, Hypothesis Five could not be accepted. However, an association appeared to be evident between an increase in body concept and a decrease in body fat.

The non-acceptance of Hypothesis Five is inconsistent with the findings of Stoner and Fiorello (1976). They found a significant difference in the Physical Self score (from the Tennessee Self Concept Scale) as well as weight loss in adolescent girls who participated in a counselling program (which included exercise) designed to affect self concept as well as weight change. They emphasized that unless a program was designed to affect change in self concept as well as weight loss, a change in self concept could not be expected to accompany a change in weight loss. Stanley et al. (1970) also observed such a relationship between body concept change and body composition change. They stated that those obese adolescent girls who managed successful weight loss "in some way improved their body image or self image or both, which in turn helped them keep their weight down" (p.34).

Summary of Relationships Among Body Concept, Self Concept, Body Composition Change in Inactive Obese and Non-obese Young Women

The subproblem of this investigation was to examine the relationships among body concept, self concept, body composition and body composition change in inactive obese and non-obese young women.

No significant differences were found between obese and non-obese subjects' means for the psychological dependent variables. However it was found that the sample means were below the average for the scale norms of the body Cathexis, Physical Self and Total Self Concept scores. It was concluded that: (1) the common characteristic of inactivity resulted in the differences between the sample means and the instruments' norms and (2) body composition did not appear to differentiate means between obese and non-obese subjects in body concept and self concept scores. The correlation matrix for all dependent variables indicated that no significant consistent relationships existed among body concept, self concept and body composition. Possible factors involved in this lack of expected relationships were: (1) the backgrounds of the obese volunteer subjects and (2) academic performance and its influence on the perception of the self. It was concluded that factors other than body composition were more effective in influencing body concept and self concept in this sample of young university women.

Hypothesis Four stated that the inactive obese young women have a lower body concept than the inactive non-obese young women. No significant difference was found between the body concept scores of the obese and the non-obese subjects, therefore Hypothesis Four could not be accepted. Possible factors involved in the lack of expected difference in body concept were: (1) the characteristics of the obese individuals who volunteered to be subjects, (2) the validity of the subjects' responses on the questionnaires and (3) the common characteristic of inactivity in body obese and non-obese subjects.

Hypothesis Five stated that the degree of change in body concept is proportional to the amount of change in body composition over a 10 week body awareness exercise program. An association appeared to be evident in that an increase in body concept was associated with a decrease in body fat. However, this association was not proven to be significant, therefore, Hypothesis Five could not be accepted. The unexpected lack of relationship between body concept change and body composition change suggests that inactivity was more influential in affecting body concept than was body composition.

Based on the results of the data analyses, it may be concluded that in inactive obese and non-obese young women:

1. there were no significant relationships among body concept, self concept and body composition,
2. sample means were below instruments' norms for Body Cathexis, Physical Self and Total Self Concept,
3. body composition as a factor did not differentiate means between obese and non-obese subjects in psychological dependent variables,
4. inactive obese young women did not differ significantly from inactive non-obese young women in body concept,
5. an increase in body concept scores appeared to be associated with a decrease in body fat scores. However, this association was found to be non-significant.

In conclusion, it would appear that for the young women in this study, body composition was not influential in affecting body concept and self concept. The common characteristic of inactivity appeared to have more effect on body concept and self concept than did body composition.

CHAPTER V

SUMMARY AND CONCLUSIONS

Summary

The effect of inactivity and its relationship to obesity is a very important factor for the physical educator to consider when designing exercise programs for the treatment and/or prevention of obesity in inactive people. Traditionally, conventional exercise programs for the treatment and prevention of obesity in inactive people have been designed specifically to obtain physiological changes. The possibility of positive psychological effects resulting from exercise often has not been considered or emphasized. Therefore the present study was concerned with the psychological effects as well as the physiological effects of an exercise program designed specifically to affect body awareness.

Purpose. The main problem of this investigation was to study the effects of a 10 week body awareness exercise program on the body concept, self concept and body composition in inactive obese and non-obese young women. A subproblem was to examine the relationships among body concept, self concept, body composition and body composition change in inactive obese and non-obese young women.

Procedures. Subjects were between the ages of 17 and 25 years, inactive, and female university students living at Totem Park and Place Vanier Students Residences, the University of British Columbia, Vancouver, British Columbia. Subjects were pretested and posttested for:

- (1) body concept as evaluated by the Body Cathexis Scale (Secord & Jourard, 1953) and the Physical Self section of the Tennessee Self

Concept Scale (Fitts, 1965); (2) self concept as evaluated by the Self Cathexis Scale (Secord & Jourard) and the Tennessee Self Concept Scale (Fitts), and (3) body composition as evaluated by the Yuhasz (1973) method for determining the Percent Body Fat score. Complete data was obtained for 50 subjects: 10 obese and 15 non-obese in both the treatment and control groups.

The study used a 2 x 2 x 2 factorial design with repeated measures on the third factor. The independent variables were: (1) the treatment factor, (2) the size factor and (3) the time factor. Five dependent variables were measured: (1) Body Cathexis, (2) Physical Self, (3) Self Cathexis, (4) Total Self Concept and (5) Percent Body Fat.

The treatment group participated in a 10 week body awareness exercise program for a minimum of three half-hour sessions a week. The exercise program consisted of a set of exercises designed specifically to develop and/or improve body awareness through rhythmical movement based on the isolation technique.

Results. Statistical analyses of the data indicated that under the conditions of this investigation, the following results were found:

1. Main Problem: The body awareness exercise program caused: (a) a positive change which approached significance in Physical Self ($p = .07$) and in Total Self Concept ($p = .06$), (b) a positive change which was not considered significant in Body Cathexis ($p = .61$) and in Self Cathexis ($p = .18$), (c) a significant positive change ($p = .01$) in Percent Body Fat.

2. Subproblem. No significant relationships were found: (a) among body concept, self concept and body composition in inactive obese and non-obese subjects, (b) between obese and non-obese subjects in body concept and (c) between body concept change and body composition change in obese treatment subjects.

Conclusions

Within the limitations and delimitations of the sample population, experimental procedures utilized and statistical analyses performed, the following conclusions appear warranted:

1. Main Problem: The increase in physical activity through participation in the body awareness exercise program had: (a) a positive change which was not considered to be significant in body concept or self concept (however, a positive change approaching significance was noted as delimited by the results obtained from the Physical Self and Total Self Concept scores from the Tennessee Self Concept Scale), and (b) a significant positive change in body composition resulting in fat reduction.

2. Subproblem: It was observed that: (a) there was no significant relationships among body concept, self concept, body composition and body composition change, (b) body composition was not influential in affecting body concept and self concept changes, and (c) the common characteristic of inactivity appeared to have more effect on body concept and self concept than did body composition.

Since inactivity was found to be more influential than body composition for this sample of young women, it suggests that programs for the treatment and prevention of obesity in inactive obese and non-obese

young women should emphasize increasing physical activity rather than emphasize changing body composition. It also suggests that objectives for physical activity programs for the treatment and prevention of obesity in inactive young women should emphasize positive change in body concept and self concept rather than emphasize only fat and/or 'weight' loss and fitness improvement.

Recommendations

Previous discussions and conclusions based on the results of this study would seem to warrant the following recommendations:

1. Studies involving inactive obese and non-obese young women, or the general population should include methods for determining the psychological factors involved which cause or influence the inactive condition.
2. Research in the area of the psychological effects of movement should be developed and/or expanded in the field of physical education, particularly in the areas of body awareness, movement satisfaction, body concept and self concept.
3. The physical educator should become more involved with medical and psychological professionals in research on obesity and physical activity, integrating the fields of psychology and physiology.
4. A common definitional term for obesity should be adopted for use in research on obesity. This would permit a basis for comparison of research data and results which is not possible when concepts such as the overweight view of obesity are used.

5. An increased emphasis should be placed on the development of more appropriate attitudinal instruments to assess the effects of physical activity on body concept and self concept.

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APPENDIX A

PHYSICAL ACTIVITY READINESS QUESTIONNAIRE

PHYSICAL ACTIVITY QUESTIONNAIRE

VOLUNTEER FACT - FINDING QUESTIONNAIRE

GROUP A1 A2 SECTION B1 B2 CODE NUMBER _____

RESIDENCE _____ PROGRAM TIME _____

NAME _____ AGE _____ BIRTHDAY _____
 (LAST) (FIRST) DAY MONTH YEAR

RESIDENCE ADDRESS _____ RESIDENCE PHONE NUMBER _____
 (HOUSE) (ROOM)

HOME ADDRESS _____ HOME PHONE NUMBER _____

FACULTY OF STUDIES _____ YEAR _____

PHYSICAL ACTIVITY READINESS QUESTIONNAIRE

Check YES on line if the answer is YES to the question.

- _____ 1. Has your doctor ever said that you have heart trouble?
- _____ 2. Do you frequently have pains in your heart and chest?
- _____ 3. Do you often feel faint or have spells of severe dizziness?
- _____ 4. Has a doctor ever said your blood pressure was too high?
- _____ 5. Has a doctor ever told you that you have a bone or joint problem such as arthritis that has been aggravated by exercise or might be made worse with exercise?
- _____ 6. Is there a good physical reason not mentioned here why you should not follow an activity program even if you wanted to?

PHYSICAL ACTIVITY PARTICIPATION QUESTIONNAIRE

What Physical Activities have you participated in since September ?

<u>ACTIVITY</u>	<u>MINUTES PER</u>	<u>DAY</u>	<u>WEEK</u>	<u>MONTH</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
TOTAL	_____	_____	_____	_____

Please answer the following questions.

1. Are you satisfied with the silhouette of your body? YES _____ NO _____
2. If you could change your silhouette what parts would you change? (Large or smaller, be specific).

.....

.....

3. Are you satisfied with your present weight? YES _____ NO _____
4. Do you think you are overweight? Yes _____ NO _____
5. If you could change your weight would you want to? GAIN _____ LOSE _____
6. Are you satisfied with the way your body is able to move when you participate in physical activities? Yes _____ NO _____

APPENDIX B

YUHASZ SKINFOLD MEASUREMENT TECHNIQUE

YUHASZ METHOD FOR DETERMINING BODY COMPOSITION

Sites For Skinfold Measurements

1. Tricep

- Located on the right arm at the midposterior midpoint between the tip of the acromion and the tip of the olecranon with the elbow in 90 degree flexion, with the extremity hanging straight in an extended but relaxed position. The skinfold is lifted parallel to its long axis and should be located precisely.

2. Subscapular

- Taken below the tip of the inferior angle of the right scapula with the subject in a relaxed standing position. The fold is taken in the diagonal plane at about a 45 degree angle from the horizontal and vertical planes medially upward and laterally downward. Some differences in locating the site are not important.

3. Rear Thigh (Women Only)

- The skinfold is located midway on the back of the upper leg. The foot is placed on a 6" step with the knee slightly flexed and muscles relaxed. The skinfold is lifted parallel to the long axis of the leg.

4. Front Thigh

- The skinfold is located midway between the hip and knee joints, on the front of the upper leg over the quadriceps. The leg is held in the same position as in the rear thigh measurement.

5. Supra-iliac

- The skinfold is located immediately above (1 to 2 inches) the crest of the right illium (anterior, superior iliac spine). The thumb is placed over the iliac crest, and the fold lifted at a slight angle to the vertical along the normal fold line on the midaxillary line.

6. Abdominal (Umbilical)

- The skinfold is located to the left of, adjacent to and in line with the navel. The fold is lifted parallel to the long axis of the body, and the measurement is taken just below the level of the navel.

Calculations

SKIN FOLD MEASURES

				C1	C2
1. Triceps	C1	_____	_____	_____	_____
	C2	_____	_____	_____	_____
2. Subscapular	C1	_____	_____	_____	_____
	C2	_____	_____	_____	_____
3. Abdominal	C1	_____	_____	_____	_____
	C2	_____	_____	_____	_____
4. Suprailiac	C1	_____	_____	_____	_____
	C2	_____	_____	_____	_____
5. Front thigh	C1	_____	_____	_____	_____
	C2	_____	_____	_____	_____
6. Rear thigh	C1	_____	_____	_____	_____
	C2	_____	_____	_____	_____
TOTAL C1				_____	_____
				C2	_____

(Sum of 6 skinfolds X Coefficient) + Constant = _____ % Fat % Fat C1 _____

(----- X 0.127) + 4.47 = _____ % Fat % Fat C2 _____

Yuhasz, M. Physical Fitness Evaluation Manual. London, Ontario:

University of Western Ontario Press, 1973.

Table 15

Percent Body Fat and Standard Score Classification for Young Women

Classification		Percent Fat	Standard Score
Bouchard	Yuhasz	8	85
	Thin	10	80
		12	75
Non-obese	Desirable	14	70
		16	65
		18	60
	Average	20	55
		22	50
Obese	Average	23	
		24	45
		26	40
	Plump	28	35
		30	30
		32	25
	Fat	34	20
		36	15

Note: When interpreting the Yuhasz classification, the higher the standard score, the lower the percent body fat. By definition, the obese subject was one who had a standard score below 50 and a percent body fat measure above 23 percent. The non-obese subject was one who had a standard score above 50 and a percent body fat measure below 23 percent.

APPENDIX C

BODY CATHEXIS SCALE-SELF CATHEXIS SCALE

BODY CATHEXIS - SELF CATHEXIS SCALE

On the following pages 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.

Consider each item listed below and encircle 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.

Scoring of Scales1. Body Cathexis Scale

Total all circled scores and divide by 46 (number of items).

2. Self Cathexis Scale

Total all circled scores and divide by 55 (number of items).

Secord, P.F., and Jourard, S.M. - "The Appraisal of Body Cathexis":
Body Cathexis and the Self - Journal of Consulting Psychology, 1953,
17: 5, 343 to 347.

BODY CATHEXIS SCALE

<u>ITEM</u>	<u>RATING</u>	<u>ITEM</u>	<u>RATING</u>
hair	1 2 3 4 5	width of shoulders	1 2 3 4 5
facial complexion	1 2 3 4 5	arms	1 2 3 4 5
appetite	1 2 3 4 5	chest	1 2 3 4 5
hands	1 2 3 4 5	eyes	1 2 3 4 5
distribution of hair over body	1 2 3 4 5	digestion	1 2 3 4 5
nose	1 2 3 4 5	hips	1 2 3 4 5
fingers	1 2 3 4 5	skin texture	1 2 3 4 5
elimination	1 2 3 4 5	lips	1 2 3 4 5
wrists	1 2 3 4 5	legs	1 2 3 4 5
breathing	1 2 3 4 5	teeth	1 2 3 4 5
energy level	1 2 3 4 5	forehead	1 2 3 4 5
back	1 2 3 4 5	feet	1 2 3 4 5
ears	1 2 3 4 5	sleep	1 2 3 4 5
chin	1 2 3 4 5	voice	1 2 3 4 5
exercise	1 2 3 4 5	health	1 2 3 4 5
ankles	1 2 3 4 5	sex activities	1 2 3 4 5
neck	1 2 3 4 5	knees	1 2 3 4 5
shape of head	1 2 3 4 5	posture	1 2 3 4 5
body build	1 2 3 4 5	face	1 2 3 4 5
profile	1 2 3 4 5	weight	1 2 3 4 5
height	1 2 3 4 5	sex (male/female)	1 2 3 4 5
age	1 2 3 4 5	back view of head	1 2 3 4 5
waist	1 2 3 4 5	trunk	1 2 3 4 5

SELF CATHEXIS SCALE

<u>ITEM</u>	<u>RATING</u>	<u>ITEM</u>	<u>RATING</u>
first name	1 2 3 4 5	sensitivity to opinion of others	1 2 3 4 5
morals	1 2 3 4 5	ability to lead	1 2 3 4 5
ability to express self	1 2 3 4 5	last name	1 2 3 4 5
taste in cloths	1 2 3 4 5	impulses	1 2 3 4 5
sense of duty	1 2 3 4 5	manners	1 2 3 4 5
sophistication	1 2 3 4 5	handwriting	1 2 3 4 5
self-understanding	1 2 3 4 5	intelligence level	1 2 3 4 5
life goals	1 2 3 4 5	athletic skills	1 2 3 4 5
artistic talents	1 2 3 4 5	happiness	1 2 3 4 5
tolerance	1 2 3 4 5	creativeness	1 2 3 4 5
moods	1 2 3 4 5	love life	1 2 3 4 5
general knowledge	1 2 3 4 5	strength of conviction	1 2 3 4 5
imagination	1 2 3 4 5	conscience	1 2 3 4 5
popularity	1 2 3 4 5	skill with hands	1 2 3 4 5
self-confidence	1 2 3 4 5	fears	1 2 3 4 5
ability to express sympathy	1 2 3 4 5	capacity for work	1 2 3 4 5
emotional control	1 2 3 4 5	conscientiousness	1 2 3 4 5
self-consciousness	1 2 3 4 5	ability to meet people	1 2 3 4 5
generosity	1 2 3 4 5	self-discipline	1 2 3 4 5
ability to accept criticism	1 2 3 4 5	suggestibility	1 2 3 4 5
thought	1 2 3 4 5	neatness	1 2 3 4 5
artistic & literary taste	1 2 3 4 5	vocabulary	1 2 3 4 5
memory	1 2 3 4 5	procrastination	1 2 3 4 5
thriftiness	1 2 3 4 5	will power	1 2 3 4 5
personality	1 2 3 4 5	self-assertiveness	1 2 3 4 5
self-respect	1 2 3 4 5	ability to make decisions	1 2 3 4 5
ability to concentrate	1 2 3 4 5	dreams	1 2 3 4 5
ability to take orders	1 2 3 4 5		

APPENDIX D

BODY AWARENESS EXERCISE PROGRAM

BODY AWARENESS EXERCISE PROGRAM

The body awareness exercise program employed in this study is designed specifically to develop and/or improve body awareness through the use of rhythmical movement. Based on the 'isolation technique' (Mishkin and Schill, 1973) of learning and producing movement, the movement program emphasizes body awareness and movement satisfaction.

Objectives

1. To improve body awareness through the 'isolation technique' which develops direct control over specific body parts.
2. To improve the participants' satisfaction with their ability to move.
3. To improve mobility of the major joints and flexibility of the major muscle groups within the body.
4. To increase the level of physical activity and enjoyment through participation in the exercise program.

Rationale

Many people have little awareness of the capabilities of their bodies (Feldenkrais, 1974). Feldenkrais has stated:

Our self image (body awareness) consists of four components that are involved in every action: movement, sensation, feeling and thought....In order to move, (one) must use at least one of his senses, consciously or unconsciously, which involves feeling and thinking. (p. 10)

Movement and awareness can be developed through exploration and experience. The basic premise of the 'isolation technique' in learning movement is that awareness can be developed in specific body parts and through this increased awareness, control can be developed. Exploration and experience of movement are essential to the learning of control.

An exercise program for women should be designed to meet the specific needs of women, offering the type of movement they feel most satisfied with, and can achieve success in. Nelson and Allen (1970) found that women expressed more satisfaction with those aspects of their movements which related to rhythmical and graceful qualities. The body awareness exercise program employed in this study is dance oriented, rhythmical movement accompanied with recorded music. Since each woman is encouraged to become aware of her own body, the movements are self-paced for individual abilities, progressions and evaluation.

Program Technique

The exercise program uses the 'isolation technique' (Mishkin & Schill) which may be described as follows: (1) specific joints or sets of joints are isolated, (2) the remaining parts of the body are relaxed and used for support and balance only, (3) muscle action pertaining to that specific, isolated joint or joints is explored and practiced. One or more isolated movements are possible at the same time. This requires a greater degree of body awareness and control. Combinations of movements and body parts have been added to increase the level of control and body awareness. This method allows for the development of direct control over specific body parts and allows for spontaneous yet controlled movement.

Program Evaluation for Effect on Body Concept and Self Concept

Body concept was evaluated objectively by using the Physical Self score of the Tennessee Self Concept Scale (Fitts, 1965) and the

Body Cathexis Scale (Secord & Jourard). Self concept was evaluated objectively by using the Tennessee Self Concept Scale Total Self Concept Score (Fitts) and the Self Cathexis Scale (Secord & Jourard).

Program Design

The exercise program is specifically designed for the inactive woman so that she may (1) become more aware of her body and her body's capacity for enjoyable movement, and (2) prepare her body for more active and strenuous movement. Emphasis is placed on body awareness and increased mobility and flexibility of the major joints and muscles of the body. Speed, strength and endurance are de-emphasized so that the inactive woman does not feel frustrated or unsuccessful because she cannot keep up or compare with the active woman. The movements are done slowly and rhythmically without bobbing or jerky movements.

A specific progression sequence is followed in order to 'warm-up' the body and prepare it for more strenuous movement. Awareness is focussed upon the 'arm-shoulder-chest' and the 'leg-hip-waist' areas of the body. These are the areas with which most women are dissatisfied, about which they worry the most for appearance sake, and on which they tend to deposit excess fat. (Stuart, in press).

Program Description

The program description is designed so that the body part, movement pattern name and developmental sequence of each specific movement is outlined (see Figure 9).

<u>BODY PART</u>	<u>MOVEMENT PATTERN</u>	<u>DEVELOPMENTAL SEQUENCE</u>
<u>Head</u>	A. (1) <u>Vertical Head Circle</u> (standing)	(a) Tilt head forward... (b) Tilt head backward (e) Combine movements...
	B. (2) <u>Horizontal Head Circle</u> (standing)	(a) Push chin forward... (b) Pull chin backwards... . . . (e) Combine movements...
	C. (3) <u>Horizontal Head Twist</u> (standing)	(a) Turn head to.... . . . (d) Turn head to ...
	A. (4) <u>Double Shoulder Circle</u> (standing)	(a) Lift up both (e) Combine movements...
	B. (5) <u>Single Shoulder Circle</u> (standing)	(a) Same as...
	C. (6) <u>Alternating Shoulder Circle</u> (standing)	(a) Same as....
<u>Shoulders</u>		

Figure 9

Design of Program Description

Source: See Appendix D, p.108.

The 'movement pattern' section has two sets of sequences. The capital letters refer to the series of movements for a specific body part. With a change in body part, the movement pattern letter series starts again with A., B., C.,..... The numbers in brackets refer to the total program sequential progression, that is, starting at the head, moving down to the feet, concentrating on the leg-hip-waist area, and reversing the sequence and finishing at the head.

The program's sequential progression followed a specific pattern:

Warm-up	-	(1)	to	(28)	
Leg-hip-waist concentration	-	(29)	to	(49)	
Warm-down	-	(28)	to	(1)	same as warm-up but reverse order
					plus
		(50)	to	(57)	

In this study, each exercise session required half an hour to complete, with each movement being repeated eight times to recorded 2/4, 4/4 rhythms.

BODY AWARENESS THROUGH MOVEMENT PROGRAM
(ISOLATION TECHNIQUE)

MOVEMENT PATTERNS AND SEQUENCES

<u>BODY PART</u>	<u>MOVEMENT PATTERN</u>	<u>DEVELOPMENTAL SEQUENCE</u>
<u>Head</u>	A. (1) <u>Vertical Head Circle</u> (Standing)	(a) Tilt head forward, chin to chest (b) Tilt head backward, back of head to spine (c) Tilt head to right side, ear to shoulder (d) Tilt head to left side, ear to shoulder (e) Combine movements to form circle, tilt front, tilt side, tilt back, tilt side. Circle in both directions.
	B. (2) <u>Horizontal Head Circle</u> (arms above head, hands joined, palms together, elbows bent, standing)	(a) Push chin forward, parallel to ground (b) Pull chin back toward spine parallel to ground (c) Push right ear to right elbow, parallel to ground, do not let head tilt to side (d) Push left ear to left elbow (e) Combine movements to form circle, push front, push side, pull back, push side. Circle in both directions.
	C. (3) <u>Horizontal Head Twist</u> (standing)	(a) Turn head to look over right shoulder, eyes look left (b) Turn head to look over left shoulder, eyes look right (c) Turn head to look over right shoulder, eyes look right (d) Turn head to look over left shoulder, eyes look left.
<u>Shoulders</u>	A. (4) <u>Double Shoulder Circle</u> (arms down at sides or arms out at shoulder level, standing)	(a) Lift up both shoulders towards ears (b) Push down both shoulders towards floor (c) Pull both shoulders towards front midline, 'rounding shoulders' (d) Pull both shoulders towards back midline (e) Combine movements to form circle, lift up, pull back, push down, pull front. Circle in both directions, forwards and backwards.

- B. (5) Single Shoulder Circle
(~~arms down at sides or~~
arms out at shoulder
level, standing) (a) Same as double shoulder circle, but
only circle one shoulder at a time,
both forwards and backwards.
- C. (6) Alternate Single Shoulder
Circle
(arms down at sides or
arms out at shoulder
level, standing) (a) Same as single shoulder circle, but
alternate left and right. Circle
both forward and backward.
- Arms and A. (7) Single Shoulder Push-
Shoulder Pull (Standing)
Combination (a) Push right shoulder forward
(b) Pull right shoulder back
(c) Repeat with left shoulder.
- B. (8) Alternate Single
Shoulder
Push-Pull
(arms out at shoulder
level, elbows slightly
bent, standing) (a) Same as single shoulder push-pull
but push right shoulder front, push
left shoulder front, pull right
shoulder back, pull left shoulder
back, front, front, back, back.
- Arms A. (9) Alternate Arm Swings
(standing) (a) Left arm swings, palm backward
and up as right arm swings palm
frontward and up, hold, then
reverse action in (b)
(b) Left arm swings forward and down
to start position, right arm
swings forward and down to
start position.
(c) Repeat with right arm swinging
backwards and up and left arm
swinging forward and up so that
movement becomes continuous.
- B. (10) Alternate Arm Circle
(standing) (a) Arm swings from front, upwards,
over shoulder, backwards, down
towards front again as in
backstroke. Alternate right
and left circles.
(b) Repeat arm circles but change
directions so movement starts
backwards, up, over, front and
down.
- C. (11) Double Arm Swing
(knees bend in time
with swing, standing) (a) Same as alternate arm swing but
both arms move backwards together
and forwards together.
- D. (12) Double Arm Circles
(standing) (a) Same as single arm circle but
both arms move together

(b) Start with large circle, then make circle smaller as arms come down to shoulder level ending with arms straight out at shoulder level and very small circles.

(c) Do circles both forwards and backwards

E.(13) Arm Rotation

(a) Arms out at shoulder level, twist arms on shoulders both forwards and backwards.

F.(14) Vertical Arm Abduction Adduction (standing)

(a) Arms at sides, lift both arms slowly straight up, touching hands above head, hold.(Abduction)

(b) Slowly lower arms down sideways, reversing action to(a).(Adduction)

(c) Repeat slowly and rhythmically.

G(15) Horizontal Arm Abduction- Adduction(standing)

(a) Arms straight out, in front of body, at shoulder level, hands together palms out, slowly swing arms sideways and back as far as possible in a horizontal path, hold, turn palms towards front. (Abduction)

(b) Slowly swing arm forward to original position in horizontal path. (Adduction)

(c) As palms come together, turn palms up so that little fingers are together. Keeping palms up, slowly bring each pair of fingers towards wrists, starting with little fingers, one pair at a time, ending with thumb. Movement is like a wave through the fingers as a fist is formed. Turn fists towards each other, then down, then facing out. The movement is done as a circle with the little fingers starting together, palms up. The fingers close, the hands turn in, down then out so that the palms are facing out. As the hands turn out, the fingers straighten, starting with the little fingers. The complete

movement is a circle with the fingers closing on the up and in, and opening on the down and out.

(d) Repeat slowly and rhythmically, (a-c)

H(16) Diagonal Arm Abduction-adduction (Standing)

(a) Same movements as Horizontal, except the arms move in a diagonal direction.

Rib Cage A(17) Horizontal Rib Cage Circle
(arms out at shoulder level or hands on hips, standing)

- (a) Push rib cage to right side with horizontal movement
- (b) Push rib cage to left side with horizontal movement
- (c) Push rib cage forward pushing chest forward in a horizontal movement
- (d) Pull rib cage backward rounding shoulders, in horizontal movement.
- (e) Combine movements to form circles, push front pull back push side.
- (f) Make large and small circles with hands out and with hands on hips.

B(18) Vertical Diamond Roll
(hands on hips, Standing)

- (a) Start with rib cage centered, push rib cage diagonally up and to the right side
- (b) Lift rib cage diagonally up and to the left to reach center front, breath in on this movement.
- (c) Drop rib cage diagonally down and to the left
- (d) Pull rib cage diagonally down and to right to reach center front of starting position, breath out on this movement.
- (e) Combine movements to make smooth diamond shaped roll-up right side, up center down left side down center, do both to right and left sides, do large and small rolls.

C (19) Horizontal Rib Cage
Twist
 (arms at sides,
 Standing)

- (a) Twist rib cage to right, with turning head left and eyes looking right
- (b) Twist rib cage to left, while turning head right and eyes looking left
- (c) Twist rib cage to right, turn head right, eyes right
- (d) Twist rib cage to left, turn head left, eyes left
- (e) Do continuously in rhythmical movements, turn right, turn left.

D. (20) Shoulder Shimmy
 (arms up at shoulder level or down at sides, standing)

- (a) With head facing center, eyes looking ahead, twist rib cage to left, then right, continuously increase speed of twist, decrease size of movement.

Hips

A. (21) Pelvic Tilt
 (knees bent, standing, arms any position)

- (b) Pelvic tilt backwards - arch lower back, push hips backwards and up.
- (c) Pelvic tilt forwards -round lower back, push hips forwards and up
- (d) Put hands on seat so that the hips can be felt moving backwards, then on the forward tilt push seat forward with hands to feel the forward tilt, do slowly and rhythmically, arch and round.

B. (22) Horizontal Hip Circle
 (hands out or at sides, knees bent or straight, standing)

- (a) Push hip to right side
- (b) Push hip to the left side
- (c) Pelvic tilt forward pushing hips forward
- (d) Pelvic tilt backwards.
- (e) Combine movements to form circle, tilt front, push side, tilt back, push side. Circle both to right and left, large and small.

C. (23) Horizontal Backward
Figure 8
 (knees bent, standing, arms any position)

- (a) Twist hip on right diagonal so that the right hip is in front and the left hip is in back.

- (b) Push right hip to right front as far as possible.
- (c) Twist right hip to side and backwards as far as possible which will twist the left hip to left diagonal at same time, so this move ends with left hip in front and right hip behind on left diagonal.
- (d) Push left hip to left front as far as possible.
- (e) Twist left hip to side and backwards as far as possible which will twist the right hip to right diagonal at same time.
- (f) Combine movements to form continuous figure 8's, from step e go back to step b:-
diagonal front, twist-side-back
diagonal front, twist-side-back
- * Hands may be used to give direction for hip movement with right (or left) arm in front of body, draw horizontal figure 8 in air and have hips follow pattern of arms.

D. (24) Horizontal Frontward
Figure 8
(knees bent,
arms any position)

- (a) Same as horizontal backward figure 8 except the push along the diagonal is from front to back instead of from back to front, and the push along the side is from back to front instead of from front to back.

E. (25) Horizontal Hip Twist
(knees bent or straight,
arms in any position)

- (a) Twist hips to right side as far as possible.
- (b) Twist hips to left side as far as possible.
- (c) Twist hips to right, ribcage to left, head to right, eyes look left.
- (d) Twist hips to left, ribcage to right, head to left, eyes look right.
- (e) Combine movement into continuous forward-back twisting motion.

F. (26) Hip Shimmy (Basic Across)
(standing)

- (a) Tuck hip in forward pelvic tilt, weight evenly spread over both feet, knees bent.
- (b) Lift right hip up, then drop down.
- (c) Lift left hip up and drop.
- (d) Combine moves to form continuous movements - speed will increase with practice.

Knees

A. (27) Knee Circles
(standing)

- (a) Bend both knees.
- (b) Straighten both knees
- (c) Rotate ankles to right, bend knees to right
- (d) Rotate ankles to left, bend knees to left.
- (e) Do c and d but do not straighten knees between, shift knees from side.
- (f) Combine movements to form circle, bend knees, shift right, straighten, shift left, reverse direction.

Spine

A. (28) Diagonal Spinal Twist
(lying on back)

- (a) Arms out at sides, shoulder level, legs bent, feet by hips on floor, roll both legs to left side and touch knees to floor, keep shoulders on floor, turn head in opposite direction.
- (b) Roll legs across to other side and rest on floor, turn head in opposite direction
- (c) Repeat rolling legs from side to side slowly pausing at end of each movement.
- (d) Progress to lifting bent legs over hips with feet off the floor, roll legs from side to side with opposite head movement.
- (e) Repeat movement slowly.

Legs and Hips

A. (29) Single Leg Lifts
(lying on back)

- (a) Right leg straight, left leg bent, pelvis tilted forward so waist is on floor, arms out at side, lift right leg up as far as possible, hold, lower to floor. Lift right leg to side (45° to side) hips do not move off floor, hold, lower. Lift right leg to other side, hold, lower.

B. (30) Knee-Ankle
Combinations
 (lying on back)

- (b) Repeat with left leg.
- (a) Legs above hips at 90°, circle feet to right, to left, both to center, both to side.
- (b) Flex and point feet
- (c) Bend and straighten knees
- (d) Shake legs

C. (31) Hip-Leg Rotation
 (lying on back)

- (a) Lying on back, legs straight above hips about one foot apart, head and shoulders in abdominal curl, head supported with arms, pelvis tilted forward, waist on floor.
- (b) Twist legs in so that feet touch together, hold.
- (c) Twist legs out so that feet point away from each other, hold.
- (d) Repeat slowly and continuously.
- (e) Relax head and shoulders from time to time.
- (f) Repeat with legs straight, together but on floor, keep pelvis tilted forward, waist on floor.

D. (32) Leg Adductors
 (lying on back)

- (a) Knee bent, feet together flat on floor, waist pushed against floor with pelvic tilt forward, hands clasped behind head, elbow against side of head, lift head (supported by arms) and shoulders up and look at knees (abdominal hold optional)
- (b) Let knees slowly separate, moving as far apart as comfortable, hold, (gravity stretch).
- (c) Slowly pull legs back together, (adductor contraction).
- (d) Relax, dropping head, then repeat open, closed, sequence.
- (e) Same body position, but this time legs are straight and above hips, keep waist on floor with front pelvic tilt, lift head and shoulder up, look at legs, hold.
- (f) Let legs separate and move as far apart as possible.
- (g) Close legs together slowly and relax.
- (h) Same as e to g but relax head and shoulders, use hands to push against inner thigh to supply additional resistance.

- (i) a to g arms can follow action of legs in adduction-abduction.
- E.(33) Leg Abductor-Adductor
Combination
(lying on back)
- (a) With legs center and together above hips, head and shoulders relaxed, arms out at side, pelvic tilted forward, drop right leg to right side and rest it on floor, keeping left leg centered, hold.
- (b) Drop left leg slowly on top of right leg, hold.
- (c) Lift left leg back up to center, hold.
- (d) Lift right leg back up to center, hold.
- (e) Repeat dropping left leg to left side first.
- F.(34) Leg Abductor-Adductor
Hip Combination
(lying on back)
- (a) Arms out at side, head and shoulders relaxed, pelvic tilted forward, legs spread out as far as comfortable.
- (b) Keeping this distance (a) constantly drop right leg to floor with left following at set distance. Once right reaches floor let left continue moving to rest on top of right leg, hold.
- (c) Lift left leg up toward center until set distance (a) is reached, hold, then continue moving left leg over to left side with right leg following at set distance. Once left leg reaches floor let right continue to rest on top of left, hold.
- G.(35) Arm-Leg Abductor-
Adductor Combination
(lying on back)
- (a) Legs above hips (90°), hands on inner thighs, Push legs apart with hands, legs resist, as far as possible, breathe in while pushing out, hold.
- (b) Bring legs back together, resist with arms, breathe out while arms are resisting.
- H.(36) Leg Abductors
(lying on side)
- (a) Lie on left side with left leg bent under right leg for balance, arm under head, right leg straight with foot flexed and leg turned inward so toes point downward.
- (b) Lift right leg up and hold, making sure the lift is straight up the side not to front or back, the foot is flexed and the toes are pointed downward.

- (c) Lower leg slowly, then relax.
 - (d) Repeat with left leg on top.
 - (e) Progress to upper body supported by bent forearm.
 - (f) Progress to upper body supported by straight arm.

- I.(37) Thigh Extension
(lying on stomach)
 - (a) Hands under thighs or resting by sides, lift first one leg, hold, lower, then lift other leg, hold lower.
 - (b) Progress to lifting both legs, at once.
 - (c) Progress to lifting both legs and upper body.

- J.(38) Back Arch & Round
(on hands and knees)
 - (a) On hands and knees, round the back dropping the head down, hold.
 - (b) Arch back raising head, hold.
 - (c) Combine movements into flowing sequence, arch and round and arch and round.

- K.(39) Hands & Knees Hip Circle
(hands and knee position)
 - (a) Same as horizontal hip circle except the body position is hands and knees instead of standing.
 - (b) Arch back, push hips to right side.
 - (c) Round back, push hips to left side.
 - (d) Combine to form circle, arch, side round, side, change directions.

- L.(40) Hands & Knees Rib-cage Circle
(hands and knees position)
 - (a) Same as hands-knees hip circle but a rib-cage circle is done.
 - (b) Progress to combine 1 hip, 1 rib-cage circle, both directions

- M.(41) Leg, Hip, Spine Flexion-Extension
(hands and knees position)
 - (a) Bend left leg, round back, drop head bring left leg toward head and hold.
 - (b) Straighten left leg and lift up above hips, arch back, lift up head and hold.
 - (c) Repeat a and b desired number of times.
 - (d) Hold left leg up, do mini push ups touching chin to floor.
 - (e) Repeat a to d with right leg.
 - (f) Combine moves to form flowing movement, leg in, back round, leg up, back arched.

N.(42) Leg Medial Rotation
(sitting)

- (a) Sit on floor with feet about two feet apart, legs bent, hips by heels, straight arms supporting upper body, head relaxed.
- (b) Drop left knee in towards center to touch floor, feel stretch diagonally from outside hip to inside knee of left leg.
- (c) Lift left leg back up to starting position.
- (d) Drop right knee and repeat 4 to 8 times.
- (e) Progress to bent arm upper body support.
- (f) Progress to upper body on floor.

O.(43) Leg Lateral Rotation
(sitting)

- (a) Right leg straight, left leg bent to side so that foot is near right knee, support ankle and foot with hands, push left knee as close to floor as possible, hold, relax, repeat 4x.
- (b) Repeat with right leg bent.
- (c) Sit on floor with legs bent, knees apart soles of feet placed together, hands holding feet together.
- (d) Slowly push knees towards floor, hold (do not bounce) release.
- (e) Repeat push, hold, release.
- (f) May want to use elbow on knee to help push knees down but don't force past limit.

Spine A.(44) Lower Back Arch-Hip
Combinations Combination
(lying on back)

- (a) Lying on back, legs bent, heels as close to hips as possible. Lift hips up, keeping shoulders down on floor. Hold, relax, lower.
- (b) Lift up hips and do horizontal hip twist, relax and lower.
- (c) Lift up hips and do hip circles in both directions, relax, lower.

B.(45) Upper Back Arch-
Rib-Cage Combination
(lying on back)

- (a) With knees bent, back on floor, arms bent at side slowly arch upper back to neck level, hold, resting on neck, relax. Make sure lower back is not arching, do pelvic tilt forward to keep waist on floor.

- (b) Repeat a but continue arching through neck so that upper back is arched from waist to top of head which is resting on floor, weight of upper body is supported by bent arms and head, hold position then relax.
- (c) With same position as b̄ do shoulder (breast) shimmy, relax, lower.
- (d) With same position as b̄ do rib-cage circles in both directions, relax, lower.

C.(46) Trunk Curl Up
(lying knees bent)

- (a) Bring right knee over hip, put right hand on right knee, put left hand behind head, arm close to side of head, breath in.
- (b) Breath out while lifting left shoulder and lift elbow towards right knee. Lift only until abdominals start to flutter then hold. The purpose of this movement is to reach the point of strain and hold, not to strain to reach the knee.
- (c) Repeat with right elbow, left knee.
- (d) Repeat with both elbows to both knees, (hips to chest, chest to hips).

D.(47) Hip-Leg Swing
Combination
(hands and knees position)

- (a) Lift right leg parallel to floor at hip level, with foot flexed and toes pointed forward.
- (b) Swing right foot forward towards right shoulder slowly, and hold, keep arms straight, stretch over back of hip.
- (c) Swing right foot backwards towards left hip, hold, stretch over side and front of right hip.
- (d) Repeat with left leg swinging.

E.(48) Back Stretch
(standing)

- (a) Bend legs, basic balance, grounded position. Starting from head, slowly bend forward, until body is bend as far forward as possible, hold keeping legs bent.
- (b) Slowly unbend, starting with lower back, head comes up last.

F.(49) Hamsting Stretch
(standing)

- (a) Straight legs, flat back, chin up hands joined behind back, slowly lower upper body keeping legs straight, back flat as far as possible. Let arms hang over head as gravity pulls body down, hold.
- (b) Slowly lift the upper body up, leading with the chin, keeping back flat, legs straight.

Abdonminal
Spinal

A.(50) Belly Roll
(standing, knees bent;
arms any position)

- (a) Suck abdominal in and hold.
- (b) Push abdominal out and hold.
- (c) Suck in only abdominal above waist and hold.
- (d) Push out only abdominal above waist and hold.
- (e) Suck in only abdominal below waist and hold.
- (f) Push out abdominal below waist and hold.
- (g) Push abdominal above waist out.
- (h) Push abdominal below waist out.
- (i) Suck in abdominal above waist.
- (j) Suck in abdominal below waist.
- (k) Combine g' to j' to form continuous circular flow of abdominal top out, bottom out, top in, bottom in.

B.(51) Spine and Feet
Combination
(lying on back)

- (a) Arch and round back so that the waist is off the floor in arching and on the floor in rounding.
- (b) Flex feet so that toes point upward then extend feet so that toes point away. Combine movements into feet circles, rotating in both directions.
- (c) Combine feet and spine actions so that as the back arches the toes point away, and as the back rounds, the toes point up.

Face & Neck A(52) Vowel Sounds

B.(53) Sounds oo -ē
i-yi-yi-yi

C.(54) Cheek In & Out

- (a) Emphasize and hold vowel sounds a, e, i, o, u.
- (a) Emphasize and hold sounds.

- (a) Suck cheeks in
- (b) Push cheeks out.

D.(55) Lower Lip Push & Pull

- (a) Put lower lip over lower teeth.
- (b) Push jaw out, horizontal movement.
- (c) Pull jaw in, horizontal movement.

E.(56) Lion Face

- (a) Stick out tongue as far as possible, open eyes as wide as possible, hold.
- (b) Relax face.

F.(57) Smile

APPENDIX E

RELIABILITY STUDY FOR SKINFOLD MEASUREMENT

RELIABILITY STUDY FOR SKINFOLD MEASUREMENT

The investigator established a personal test-retest reliability score (Ferguson, 1976) before starting the study, using 10 female volunteers from a required Physical Education gymnastics course and 11 female volunteers from the study population. Both groups of volunteers included a wide range of fat deposits, similar to the study population. Each site was located, then marked with washable ink. At least two subjects were measured before a second and third set of measures was taken on an individual. Time differences between test-retest measures was between 30 to 90 minutes.

The average test and retest score was calculated for each site. Reliability scores were computed for each site using the BMD : 02D computer program (1970) to obtain a correlation score. Correlation scores are presented in Table 16.

Table 16
Skinfold Reliability Coefficients

Site	Reliability Coefficient
Triceps	0.99
Subscapular	0.99
Abdominal	0.99
Suprailiac	0.99
Front Thigh	0.99
Rear Thigh	0.99

Note: Reliability scores may have been lower if a longer period of time had been allowed to elapse between test and retest sessions.

APPENDIX F,

RAW SCORES

RAW SCORES

Table 17

Treatment - Obese Subjects' Individual Scores

Subject	Time	S I C				
		Body Cathexis	Physical Self	Self Cathexis	Total Self Concept	Percent Body Fat
1	pre	2.84	55.0	3.60	331.0	23.4
	post	3.04	62.0	3.96	311.0	21.5
2	pre	2.93	55.0	3.47	313.0	27.9
	post	3.23	61.0	3.65	317.0	24.9
3	pre	3.43	62.0	3.63	322.0	24.4
	post	3.65	66.0	3.92	348.0	26.1
4	pre	2.50	60.0	2.98	335.0	25.6
	post	3.02	62.0	2.63	334.0	22.0
5	pre	3.47	60.0	3.96	351.0	36.5
	post	3.28	58.0	4.01	336.0	33.8
6	pre	3.00	70.0	2.90	359.0	25.0
	post	3.73	67.0	3.60	353.0	23.0
7	pre	3.19	56.0	3.74	353.0	29.8
	post	2.89	54.0	3.72	349.0	31.8
8	pre	2.73	55.0	2.74	322.0	28.7
	post	3.00	66.0	2.70	322.0	25.3
9	pre	2.67	55.0	2.64	296.0	28.4
	post	2.78	53.0	2.43	273.0	25.9
10	pre	3.17	63.0	3.41	318.0	28.7
	post	4.23	71.0	4.38	364.0	27.0

Table 18

Control - Obese Subjects' Individual Scores

Subject	Time	Body Cathexis	Physical Self	Self Cathexis	Total Self Concept	Percent Body Fat
1	pre	2.76	55.0	3.10	324.0	23.7
	post	2.80	62.0	3.54	341.0	25.0
2	pre	2.69	56.0	1.74	277.0	31.8
	post	3.17	46.0	3.12	186.0	31.1
3	pre	3.15	70.0	3.61	374.0	33.5
	post	3.56	58.0	2.94	340.0	37.5
4	pre	2.97	54.0	3.67	343.0	32.0
	post	3.63	64.0	3.78	352.0	31.9
5	pre	2.95	55.0	2.41	313.0	28.5
	post	3.21	61.0	3.16	313.0	28.6
6	pre	3.36	59.0	4.12	332.0	39.2
	post	3.39	55.0	3.60	322.0	36.1
7	pre	3.02	72.0	3.60	373.0	23.6
	post	3.24	70.0	3.72	361.0	21.2
8	pre	3.08	69.0	2.90	356.0	23.7
	post	3.50	70.0	3.41	352.0	24.3
9	pre	2.71	68.0	3.59	379.0	25.4
	post	3.08	68.0	3.21	364.0	25.3
10	pre	3.20	70.0	3.60	372.0	23.1
	post	4.00	74.0	3.94	370.0	28.1

Table 19

Treatment - Non-obese Subjects' Individual Scores

Subject	Time	Body Cathexis	Physical self	Self Cathexis	Total Self Concept	Percent Body Fat
1	pre	3.43	65.0	2.94	323.0	21.4
	post	3.26	59.6	3.61	313.0	20.2
2	pre	2.71	61.0	3.20	351.0	16.4
	post	3.34	68.0	3.34	358.0	13.5
3	pre	3.00	48.0	2.76	272.0	19.0
	post	3.52	61.0	3.58	310.0	26.2
4	pre	3.65	78.0	3.94	384.0	9.7
	post	4.02	79.0	4.09	410.0	8.2
5	pre	3.60	66.0	3.90	356.0	22.5
	post	3.80	65.0	3.85	341.0	18.6
6	pre	3.50	65.0	3.98	359.0	20.3
	post	3.78	77.0	3.85	391.0	17.5
7	pre	3.56	63.0	3.52	355.0	19.8
	post	2.93	53.0	3.52	335.0	23.4
8	pre	3.00	57.0	2.60	315.0	17.8
	post	3.19	69.0	3.25	339.0	16.3
9	pre	2.36	55.0	2.36	299.0	16.9
	post	3.13	59.0	3.06	314.0	16.2
10	pre	3.17	69.0	3.69	356.0	22.8
	post	3.32	67.0	3.65	353.0	19.2
11	pre	3.30	75.0	3.61	347.0	19.9
	post	3.91	71.0	3.74	337.0	18.0
12	pre	3.84	76.0	3.87	364.0	16.4
	post	4.06	79.0	4.21	363.0	17.9
13	pre	3.13	73.0	3.12	326.0	17.5
	post	3.15	68.0	3.50	313.0	16.7
14	pre	2.76	63.0	3.47	317.0	18.1
	post	3.39	78.0	3.87	382.0	17.0
15	pre	2.95	62.0	2.92	346.0	22.3
	post	3.63	68.0	3.21	356.0	17.4

Table 20
Control - Non-obese Subjects' Individual Scores

Subject	Time	Body Cathexis	Physical Self	Self Cathexis	Total Self Concept	Percent Body Fat
1	pre	3.78	71.0	3.80	332.0	20.2
	post	3.30	66.0	3.38	302.0	23.5
2	pre	3.45	75.0	3.89	350.0	7.8
	post	3.54	73.0	3.70	348.0	8.4
3	pre	3.15	76.0	3.05	324.0	10.5
	post	2.91	70.0	3.01	318.0	13.0
4	pre	2.69	72.0	3.74	352.0	18.6
	post	3.65	76.0	3.72	364.0	18.2
5	pre	3.13	65.0	3.25	322.0	22.0
	post	3.21	72.0	3.20	339.0	23.2
6	pre	3.69	80.0	4.00	381.0	18.5
	post	3.86	69.0	3.98	353.0	17.0
7	pre	3.26	72.0	3.46	319.0	14.3
	post	3.21	74.0	3.25	313.0	16.2
8	pre	2.20	61.0	4.60	273.0	16.3
	post	2.93	61.0	2.38	273.0	15.6
9	pre	2.58	65.0	2.60	322.0	19.1
	post	2.47	68.0	2.98	309.0	18.4
10	pre	3.15	69.0	3.14	344.0	9.7
	post	3.54	67.0	3.46	346.0	11.8
111	pre	2.91	58.0	3.00	287.0	20.0
	post	2.78	49.0	3.40	273.0	21.2
12	pre	3.73	65.0	3.69	322.0	18.5
	post	3.13	68.0	3.29	364.0	18.2
13	pre	3.41	78.0	3.54	391.0	20.5
	post	3.56	75.0	3.78	386.0	27.8
14	pre	3.58	69.0	3.81	368.0	17.6
	post	3.76	68.0	3.98	352.0	15.2
15	pre	3.28	69.0	3.05	320.0	21.0
	post	3.86	62.0	3.23	341.0	18.2

APPENDIX G
MEANS AND STANDARD DEVIATIONS
FOR DEPENDENT VARIABLES

Table 21
Means and Standard Deviations for Body Concept Scores

Body Cathexis Scores				
	Treatment		Control	
	Obese	Non-obese	Obese	Non-obese
Pre	2.99 \pm .31	3.20 \pm .40	2.99 \pm .21	3.20 \pm .44
Post	3.29 \pm .43	3.50 \pm .34	3.36 \pm .32	3.31 \pm .40
Scale norm: 3.46 \pm .40				

Physical Self Scores				
	Treatment		Control	
	Obese	Non-obese	Obese	Non-obese
Pre	59.10 \pm 4.70	63.67 \pm 7.59	62.80 \pm 7.17	62.93 \pm 6.61
Post	62.00 \pm 5.48	66.73 \pm 7.70	62.80 \pm 7.92	62.00 \pm 10.14
Scale norm: 71.78 \pm 7.67				

Table 22

Means and Standard Deviations for Self Concept Scores

Self Cathexis Scores				
	Treatment		Control	
	Obese	Non-obese	Obese	Non-obese
Pre	3.31 \pm .43	3.31 \pm .51	3.23 \pm .66	3.51 \pm .49
Post	3.50 \pm .64	3.62 \pm .32	3.44 \pm .31	3.38 \pm .41
Scale norm : 3.35 \pm .50				
Total Self Concept Scores				
	Treatment		Control	
	Obese	Non-obese	Obese	Non-obese
Pre	330.00 \pm 18.85	338.10 \pm 27.93	334.30 \pm 31.45	333.80 \pm 30.75
Post	330.70 \pm 25.02	347.67 \pm 29.14	330.10 \pm 50.99	337.75 \pm 31.97
Scale norm : 345.57 \pm 30.70				

Table 23

Means and Standard Deviations for Percent Body Fat

	Treatment		Control	
	Obese	Non-obese	Obese	Non-obese
Pre	27.84 \pm 3.54	18.72 \pm 3.21	28.45 \pm 5.21	16.97 \pm 4.26
Post	26.13 \pm 3.77	17.75 \pm 3.90	28.91 \pm 4.99	17.73 \pm 4.73
Obese : above 23%				
Non-obese : below 23%				