

**THE EFFECT OF PARTICIPATION IN AN AEROBIC
DANCE EXERCISE PROGRAM ON BODY
SATISFACTION IN NORMAL ADOLESCENT
FEMALES**

BY

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This thesis, unless otherwise indicated, is my own original work.

ABSTRACT

To determine the effect of participation in an aerobic dance exercise program on body satisfaction and perceived physical fitness, the Body Esteem Scale (Franzoi & Shields, 1984) and the Perceived Physical Fitness Scale (Abadie, 1988) were administered to an experimental, comparison and control group of adolescent females. The experimental group ($n = 19$) attended aerobic dance classes for an hour, three times per week for 4 weeks. The comparison group ($n = 20$) watched an exercise video for half an hour, twice per week for 4 weeks. The control group ($n = 20$) were instructed to continue exercising as usual and received no intervention. The three groups were matched at pretest for age, height, weight, body mass index, body satisfaction, perceived physical fitness and number of hours of exercise per week that they participated in. A post assessment was made after 4 weeks when the intervention was complete and a follow-up assessment was made 11 weeks after the intervention was completed. A two-way univariate ANOVA with repeated measures on the time factor revealed no significant differences between the experimental, comparison or control groups regarding body satisfaction and perceived physical fitness although trends in the desired direction were evident. A strong positive correlation was found between body satisfaction for all the subjects at posttest and perceived physical fitness at posttest ($p < 0,01$), and between body satisfaction at follow-up and perceived physical fitness at follow-up ($p < 0,001$). The results of this study suggest that while the effects of participation in aerobic dance classes did not result in any significant findings, trends were evident and thus future research in this area which takes into account the limitations of this study is warranted. This study offers hope of exercise as an intervention to augment the cognitive-behavioural treatment of body dissatisfaction.

CONTENTS

	PAGE
CHAPTER 1 SUMMARY OF CONTENTS	1
 CHAPTER 2 LITERATURE REVIEW	
2.1 Introduction	2
2.2 Body satisfaction in females	3
2.3 Correlates of body dissatisfaction	5
2.4 Treatment of body dissatisfaction	5
2.5 The psychological effects of exercise	8
2.6 Eating disorders and excessive exercise	9
2.7 Other body image studies	13
2.8 The theoretical link between exercise and body satisfaction	26
2.9 Summary	30
2.10 The present study	30
 CHAPTER 3 METHODOLOGY	
3.1 Subjects	32
3.2 Instruments	33
3.3 Procedure	39
3.4 Statistical analysis	41

CHAPTER 4 RESULTS	PAGE
4.1 Reliability of the Body Esteem Scale	42
4.2 Correlational analysis of pre-selection data	43
4.3 Pre-intervention levels of the outcome measures	43
4.4 Intervention effects	44
4.5 Correlational analysis	52
 CHAPTER 5 DISCUSSION	
5.1 Reliability of the Body Esteem Scale	53
5.2 Correlational analysis of pre-selection data	53
5.3 Pre-intervention levels of the outcome measures	54
5.4 Intervention effects	55
5.5 Relationship between body satisfaction and perceived physical fitness	61
5.6 Other interesting findings	61
5.7 Limitations of this study	63
5.8 Conclusion	65
 REFERENCES	 66
 APPENDIX	 79
APPENDIX 1 The Body Esteem Scale	
APPENDIX 2 The Perceived Physical Fitness Scale	

APPENDIX 3	Exercising Questionnaire
APPENDIX 4	Demographic Questionnaire at pretest
APPENDIX 5	Parental consent form
APPENDIX 6	Demographic Questionnaire at posttest
APPENDIX 7	Demographic Questionnaire at follow-up

TABLES

	PAGE
TABLE 1 Descriptive characteristics of the three groups and the total sample at pretest	44
TABLE 2 Body Esteem Scale total score	45
TABLE 3 BES factor 1: mean sexual attractiveness score	46
TABLE 4 BES factor 2: mean weight concern score	47
TABLE 5 BES factor 3: mean perceived physical condition score	48
TABLE 6 Perceived Physical Fitness Scale score	49
TABLE 7 Body mass index	50
TABLE 8 Hours of exercise	51

FIGURES

	PAGE
FIGURE 1 Proposed model for the link between exercise participation and body satisfaction	27
FIGURE 2 Comparison of body esteem scale total scores for the groups across time	45
FIGURE 3 Comparison of mean BES factor 1: sexual attractiveness scores for the groups across time	46
FIGURE 4 Comparison of mean BES factor 2: weight concern scores for the groups across time	47
FIGURE 5 Comparison of mean BES factor 3: perceived physical condition scores for the groups across time	48
FIGURE 6 Comparison of perceived physical fitness scale total scores for the groups across time	49
FIGURE 7 Comparison of body mass index for the groups across time	50
FIGURE 8 Comparison of number of hours of exercise for the groups across time	51

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CHAPTER 1

SUMMARY OF CONTENTS

Body dissatisfaction is a characteristic of normal and eating disordered individuals (Garner, Olmsted, Polivy, & Garfinkel, 1984). This study will investigate the effects of participation in exercise on the body satisfaction of adolescent females. Chapter 2 discusses the literature pertaining to body dissatisfaction including the correlates of body dissatisfaction, treatment of body dissatisfaction, the effect of exercise on body dissatisfaction and the theoretical link between exercise participation and body satisfaction. In Chapter 3, the methods used in this study are discussed. This includes a description of the subjects, instruments and procedures used to collect data. Statistical analyses to be used are briefly discussed. Chapter 4 outlines the results of this study. This is divided into five sections namely: reliability check of the Body Esteem scale and its three subscales (Franzoi & Shields, 1984), correlational analysis of the data of 159 females before the subjects were selected and allocated to the three groups, comparison of pretest scores to ensure matching of the three groups, analysis of treatment effects, and a correlational analysis of body satisfaction and perceived physical fitness at pretest, posttest and follow-up. Chapter 5 discusses the results in chapter 4 section by section. Conclusions are drawn from the present study with limitations discussed and suggestions made for future research.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

The literature is inundated with studies reporting the body image experiences of anorexic, bulimic and normal weight people but these studies have yielded inconsistent results. One of the reasons for this inconsistency is because of the several and vague definitions of body image which exist. A recent study by Uys and Wassenaar (1996) reinvestigated the issue of body image disturbance in anorexic and normal females taking into account that body image disturbances consists of an affective disturbance (body satisfaction) and a perceptual disturbance (body size estimation). It was found that anorexic patients significantly overestimate waist and thigh dimensions ($p < 0,05$) and have lower body satisfaction ($p < 0,001$) than a matched group of non-anorexic women. This study suggests that specific body image disturbance and reduced body image satisfaction remain useful concepts when assessing anorexic pathology.

A study by Altabe and Thompson (1993) suggests that treatment efforts should focus on improving body satisfaction rather than body size perception. Studies of normal adults show that there is ongoing body size distortion but that body satisfaction improves with age. Treatment efforts should thus focus on helping eating disordered patients feel better about their bodies rather than attempt to change the body size distortion, which appears to resist change in normals and eating disordered patients. Furthermore, body dissatisfaction has been identified as a risk factor in the development of eating disorders (Hsu & Sobkiewicz, 1991; Lautenbacher, Thomas, Rocher, Strian, Pirke, & Krieg, 1992; Leon, Fulkerson,

Perry, & Cudeck, 1993; White, 1992) and thus its improvement may be of importance in the prevention of eating disorders.

Relatively few studies focus on specific body image interventions in eating disorders (Garner & Garfinkel, 1985). In a review by Wassenaar and Uys (1993) it was concluded that body satisfaction would appear to improve as a consequence of non-specific treatment factors that improve self-worth and competence (Fairburn, 1988), in addition to specific cognitive-behavioural or other specific body image correcting psychotherapies (Butters & Cash, 1987). Future research efforts on the treatment of body dissatisfaction and the reliable evaluation of body satisfaction should thus be conducted (Evans & Dolan, 1993).

Thompson (1990a) comments:

I have found that the institution of an exercise program almost universally produces an enhancement in self-esteem and body satisfaction. In all likelihood, this research area will receive a good deal of attention in the near future. (p. 96)

2.2 BODY SATISFACTION IN FEMALES

Studies over the past 20 years suggest that there has been a gradual change in the cultural-ideal of body shape and a shift towards a thinner size in women (Cash, Winstead, & Janda, 1986; Garner, Garfinkel, Schwartz, & Thompson, 1980; Silverstein, Perdue, Peterson, & Kelly, 1986; Snow & Harris, 1985). This contradicts research which suggests that the average weight of women under the age of 30 has increased over this same period (Metropolitan Life Foundation, 1983). The literature is inundated with studies demonstrating that a thin body is viewed more positively (Garner et al., 1980; Silverstein et al., 1986; Stake & Lauer, 1987; Stunkard, 1975) and that thin women are perceived as having desirable, feminine characteristics (Guy, Rankin, & Norwell, 1980). A possible

consequence of this cultural-ideal body image is that women who deviate from these ideal standards may develop body image dissatisfaction or an eating disorder through efforts to achieve the ideal body. The impact of this changing idealised female shape is exemplified by the pervasiveness of dieting among women (Garner et al., 1980). This is in conflict with the rapid physical and psychological changes that occur at puberty and as a result body dissatisfaction is highly prevalent in adolescent girls (Button, 1990; Davies, & Furnham, 1986; Leon, Perry, Mangelsdorf, & Tell, 1989; Wadden, Brown, Foster, & Linowitz, 1991). It has been suggested that body satisfaction in females is lowest between the ages of 13 and 15 years after which it begins to increase possibly because of the acceptance of the changed body (Rauste-von Wright, 1989). It has been suggested that adolescent girls in competitive environments that emphasise weight and appearance experience increased social pressures to meet the thin ideal (Attie & Brooks-Gunn, 1989). The areas of the body that adolescent females appear to be most dissatisfied with include thighs, buttocks, and stomach (Davies & Furnham, 1986). Body weight is also a primary source of body dissatisfaction (Berscheid, Walster, & Bohrnstedt, 1973). Tucker (1985) found that women are most satisfied with their face and overall appearance and least satisfied with their weight and lower body. Research indicates that assiduous dieting and weight preoccupation are normative behaviours (Garner, Rockert, Olmsted, Johnson, & Coscina, 1985; Rodin, Silberstein, & Striegel-Moore, 1985). It is not just eating disordered patients that exhibit body dissatisfaction, but normal females as well, although this may be to a lesser degree (Garner, Olmsted, Polivy, & Garfinkel, 1984; Uys & Wassenaar, 1996). Rosen and Gross (1987) found dieters were more likely to be white and upper class than black or lower class.

2.3 CORRELATES OF BODY DISSATISFACTION

Body image dissatisfaction has been identified by several authors as a risk factor in the development of anorexia nervosa and bulimia (Hsu & Sobkiewicz, 1991; Lautenbacher et al., 1992; Leon et al., 1993; White, 1992). A longitudinal study of 193 white females from upper-middle class families demonstrated that girls who early in adolescence felt most negatively about their bodies were more likely to develop eating problems 2 years later (Petersen, Schulenberg, Abramowitz, Offer, & Jarcho, 1984). Certain eating behaviours, such as restrictive dieting practices, have been linked with body image dissatisfaction (Cash & Hicks, 1990; Davies & Furnham, 1986; Davis, Shapiro, Elliott, & Elliott, 1993; Hawkins, Turell, & Jackson, 1983; Lautenbacher et al., 1992). Rosen (1992) and Thompson (1990b) have gone so far as to suggest that in many eating disordered individuals, the eating disturbance is actually secondary to the body image disturbance. Several authors have found significant positive correlations between self-concept and body satisfaction (Folk, Pedersen, & Cullari, 1993; Franzoi & Shields, 1984; Mahoney, 1974; Secord & Jourard, 1953; Silberstein, Striegel-Moore, Timko, & Rodin, 1988), between body dissatisfaction and depression (Lautenbacher et al., 1992), and between body dissatisfaction and anxiety (Johnson, 1956; Secord & Jourard, 1953). Given this information, the search for the treatment of body dissatisfaction is essential.

2.4 TREATMENT OF BODY DISSATISFACTION

Thompson (1990a) reviewed the literature on treatment of body image disturbance and found less than 10 studies which attempted to treat some aspect of body image disturbance. This aspect of the treatment of anorexia nervosa and bulimia nervosa has virtually been ignored yet it is a diagnostic criterion for these disorders in DSM IV (APA, 1994). This

lack of intervention Thompson claims to be ludicrous given that body image disturbance is a negative prognostic indicator for the recovery from anorexia nervosa and bulimia nervosa (Cash & Brown, 1987; Garner, Garfinkel, & Bonato, 1987; Rosen, 1990). Treatment approaches are increasingly being applied to people who do not have an eating disorder because of the increasing number of individuals who have body image disturbance yet present with no other pathology (Uys & Wassenaar, 1996). Thompson adds that it has been suggested that the singular treatment of body image disturbance may help produce important information relevant to the treatment of clinically diagnosed eating disorders (Thompson, 1987). It is important to bear in mind the distinction highlighted by Uys and Wassenaar (1996) between the perceptual component of body image (body size estimation) and the affective component (body satisfaction) which they demonstrated to be quite different constructs. The treatment of the different components should thus differ entirely, which is important to consider when comparing studies on the treatment of body image disturbance. In a review of studies of the treatment of body dissatisfaction in eating disordered populations by Wassenaar and Uys (1993) it was concluded that body satisfaction would appear to improve as a consequence of non-specific treatment factors that improve self-worth and competence (Fairburn, 1988) in addition to specific cognitive-behavioural or other specific body image correcting psychotherapies (Butters & Cash, 1987). Other well designed studies of individuals with body image dissatisfaction but no diagnosed eating disorder have also provided support for the effectiveness of cognitive and cognitive-behavioural methods in the treatment of body dissatisfaction (Butters & Cash, 1987; Dworkin & Kerr, 1987). While there have been attempts in recent years to apply cognitive-behavioural methods in psychology to the treatment of body image disturbance,

further research on cost effective methods of treating body dissatisfaction is warranted.

Thompson (1990a) concludes his review by saying :

I have found that the institution of an exercise program almost universally produces an enhancement in self-esteem and body satisfaction. In all likelihood, this research area will receive a good deal of attention in the near future. (p. 96)

Fisher and Thompson (1994) claim that until 1994 no study could be found which investigated exercise therapy in individuals with high levels of body image disturbance and consequently they undertook to compare the effects of cognitive-behavioural therapy (CBT) and exercise therapy (ET) in individuals with body image disturbance. There were 54 subjects in their study who were selected on the basis of several criteria , one of them being a score in the lower quartile on the Appearance Evaluation subscale of the Multidimensional Body-Self Relations Questionnaire (Brown, Cash, & Mikulka, 1990). The subjects, who were white females between the ages of 17 and 45, were randomly allocated to the cognitive-behavioural therapy (CBT), exercise therapy (ET) and control groups. The groups were also given the Eating Disorder Inventory (EDI) (Garner & Olmsted, 1984) to ensure that they were equivalent with regards to body dissatisfaction. The CBT group attended one group session of CBT per week for 6 weeks while the ET group attended one session per week of combined aerobic and anerobic exercises for 6 weeks and were instructed to perform homework exercises at least twice per week. The EDI body dissatisfaction subscale revealed that both therapy groups had a significant decrease in body dissatisfaction and had significantly lower body dissatisfaction at post-treatment than the control group. The CBT and ET groups revealed equivalent decreases in body dissatisfaction. Unfortunately a follow-up study to investigate sustained benefits was not possible due to the unavailability of subjects. The authors suggest that this area should

receive more attention but with the some improvements in the design of the study such as a follow-up study and collection of subjects' activity levels to ensure that the non-exercising groups do not change their exercise habits.

2.5 THE PSYCHOLOGICAL EFFECTS OF EXERCISE

There is a plethora of studies investigating the relationship between exercise and physical and psychological well-being. The International Society of Sport Psychology (ISSP, 1992) prepared a position statement on the psychological benefits of being actively involved in regular vigorous activity. They include: positive causal effects on self-esteem, reduced state anxiety, decreased level of mild to moderate depression, reductions in neuroticism and anxiety, reduction of various stress indices, and beneficial emotional effects. Exercise may be used as an adjunct to the professional treatment of clinical depression. Self-concept has been identified as the psychological variable which has the greatest potential to benefit from regular exercise (Folkens & Sime, 1981; Hughes, 1984). In the position statement by the ISSP (1992) it is also suggested that a duration of 20-30 minutes of physical activity at least three times per week of 60-90% of age estimated maximum heart rate could result in desirable psychological benefits. Kirkcaldy and Shephard (1990) review the literature on the therapeutic implications of exercise and conclude that exercise can be pursued to the point of addiction, musculo-skeletal injury or even heart attack, but the psychological and physiological gains are much greater than any deleterious consequences when participation is moderate. The idea of exercise as a treatment for body dissatisfaction has intuitive appeal given the preceeding positive findings but the literature investigating the relationship between body image and exercise participation is not as abundant. Before reviewing the literature on body image and exercise, it is important to discuss a possible criticism which

may be posed at this point. Some research has indicated a possible role of exercise in the development of eating disorders (Davis, Fox, Cowles, Hastings, & Schwass, 1990). It would therefore seem contraindicated to propose exercise therapy in the treatment of body dissatisfaction, as exercise may in itself be a risk factor for the development of eating disorders. This is an important criticism and the literature in this area will be reviewed in order to clarify the issue.

2.5 EATING DISORDERS AND EXCESSIVE EXERCISE

Overactivity in the description of anorexia nervosa dates back over a century to the descriptions offered by Lasague (1873) and Gull (1873). While many authors have noted this hyperactivity of patients with anorexia nervosa, they have generally viewed this behaviour as a mere symptom of the anorexic syndrome (Epling, Pierce, & Stefan, 1983). Some studies have been conducted which suggest that excessive exercisers may have a disorder similar to that of anorexia nervosa (Yates, 1991; Yates, Leehey, & Shisslak, 1983). Several researchers have described the characteristics of excessive exercise that include maintenance of a rigid, intense exercise schedule, feelings of guilt and anxiety when this schedule is not adhered to, compensatory exercise to make up for training sessions missed, perseverance with exercise even if tired, sick or injured, mental preoccupation with exercise and record keeping of exercise (Blumenthal, O'Toole, & Chang, 1984; DeBenedette, 1990; Nudelman, Rosen, & Leitenberg, 1988; Yates et al., 1983; Yates, Shisslak, Allender, Crago, & Leehey, 1992). Research investigating the personality profiles of eating disorder patients and excessive exercisers has produced contradictory results with some studies suggesting definite similarities (Yates et al., 1983) and others very few (Blumenthal, O'Toole, & Chang, 1984; Hauck & Blumenthal, 1992; Krejci, Sarjent, Forand, Ureda, Saunders, &

Durstine, 1992; Nash, 1987; Nudelman et al., 1988). Le Grange and Eisler (1993) outline six similarities between individuals who are anorexic or exercise in excess. The first similarity is the strong sense of commitment which they hold. In the same way and to the same extent to which eating disordered women are engrossed in weight control, excessive exercisers are engrossed in exercise. The second similarity is the compulsive and obsessive characteristics common to both groups. The third similarity is that both anorexia nervosa and excessive exercise appear and develop during a period of increased stress and conflict centred around self-identity. The fourth similarity is a fear of weight gain among anorexics and competitive athletes. The fifth similarity is the strong link between both anorexia nervosa and excessive exercisers and depressive disorders. The sixth similarity relates to the nature of the addiction. Just as anorexics are known to experience feelings of guilt, irritability and anxiety if denied the opportunity to starve, so will excessive exercisers experience withdrawal symptoms such as depression, anxiety and irritability if unable to run. It is, however, not sufficient to note descriptive similarities between anorexia nervosa and excessive exercisers but instead more empirical work which investigates causal relationships between the two is required.

Female athletes have recently been identified as a population at risk for developing eating disorders (Burkes-Miller & Black, 1991; Striegel-Moore, Silberstein, & Rodin, 1986). It is argued that despite being psychologically healthy, they are still at risk for developing eating disorders because of the unique and intense pressures associated with sport participation such as demands to achieve a certain weight and appearance. Studies investigating the relationship between sport participation and risk of developing an eating disorder have produced equivocal results. Some studies have found that athletes from certain sports are

more at risk than athletes from other sports (Borgen & Corbin, 1987; Davis & Cowles, 1989) while other studies have found that athletes do not show any differences in eating behaviour when compared to non-athletes (Harris & Greco, 1990; Wilkins, Boland, & Albinson, 1991). The problem with these studies is that their results have to be interpreted cautiously due to methodological shortcomings. Petrie (1993) argues that firstly, many of the samples in these studies were small or drawn from restricted geographical locations. Secondly, when the samples have been large they have often included athletes from different sports and thus the responses of athletes from certain sports could bias the results of the sample as a whole. Thirdly, some of the eating disorder questionnaires used have had inadequate or unestablished psychometric properties. Eisler and le Grange (1990) have proposed four models which explain the link between anorexia nervosa and excessive exercising each having unique aetiological mechanisms. The first model proposes that the two are independent syndromes and that any similarity between the two are superficial. Although there may be similarities in presentation, their aetiologies are different. It acknowledges that many anorexics use exercise to achieve and maintain a low weight but the exercise is viewed as a secondary symptom and as a means for achieving this goal. There has been much research which supports this model (Hauck & Blumenthal, 1992; Nash, 1987). The second model proposes that the two conditions form overlapping groups where the possibility of excessive exercise leading to anorexia nervosa exists. This model implies that individuals who exercise excessively put themselves at risk for developing an eating disorder. This can occur in two ways. Firstly, some athletes may diet to enhance their performance and this dieting pattern may induce starvation dependence which in turn may develop into anorexia nervosa. Several authors have supported this hypothesis and found excessive exercising to precede dieting although pursuit of thinness may have been the

initial goal of exercise (Black & Burkes-Miller, 1988; Blinder, Freeman, & Stunkard, 1970; Davis et al., 1990; Katz, 1986; Kron, Katz, Gorzynski, & Weiner, 1978; Striegel-Moore, Silberstein & Rodin, 1986; Szmukler & Tantum, 1984 cited in Eisler & le Grange, 1990). They suggest that exercise focuses attention on the relationship between peak performance and weight and sets the cycle in motion. Secondly, physical activity can result in reduced food intake in animals and humans (Epling et al., 1983). It is suggested that during the early stages of food restriction, physical activity increases as this is a biological mechanism which increases the likelihood of the organism finding food (Davis et al., 1990). Beumont, Arthur, Russell, and Touz (1994) claim that the organism soon adapts to this high level of activity and will consume enough food to maintain its weight. When food is restricted, this compensatory behaviour cannot occur and the energy intake is decreased. The third model proposes that both anorexia nervosa and excessive exercising are related to another underlying disorder. Either they are both manifestations of a disorder such as depression as Halmi (1985) suggests, or the related disorder for example, depression, may be a predisposing factor for the development of either condition as suggested by Szmuckler (1987). Eisler and le Grange (1990) claim that this model is unlikely to gain empirical support as it does not imply causality. The fourth model proposes that excessive exercising is a variant of anorexia nervosa and that the same factors which influence the development of anorexia nervosa may lead to the development of a disorder which manifests differently. Anorexia nervosa and excessive exercising are possibly thus only superficially different manifestations of the same disorder. Yates et al. (1983) have provided the strongest support for this model and claim that the strength of this model lies in the fact that it accounts for the sex ratio in eating disorders. DSM IV (APA, 1994) claims that more than 90% of the cases of anorexia occurs in females which Yates et al. (1983) claim is because the same

underlying disorder manifests as excessive exercising in males and as anorexia nervosa in females.

McDonald (1994) provides a thorough summary of criticisms of the research conducted in this area. Most of the research investigating the relationship between exercise dependence and eating disorders has been conducted with runners (Hauck & Blumenthal, 1992) and thus it is thus questionable whether the results of these studies are generalisable to other exercise groups. Eisler and le Grange (1990) point out that many of these studies are anecdotal case reports and that the results of many of the controlled studies are problematic due to methodological shortcomings. Any conclusions drawn must hence be made with caution. Another problem which makes comparison of these studies difficult is the lack of agreement on a definition of exercise dependence. There is also a lack of standardised measuring instruments of exercise dependence which makes it difficult to establish the prevalence of exercise dependence (Hauck & Blumenthal, 1992). Despite some similarities between anorexia nervosa and excessive exercise, the aetiological, psychodynamic and symptomatic relationship between the two remains unclear.

2.7 OTHER BODY IMAGE STUDIES

Studies investigating the relationship between exercise and body image have yielded inconsistent results and for the purpose of clarity they will be discussed in terms of experimental design and in terms of studies yielding significant positive findings, negative findings and no significant findings at all.

2.7.1 COMPARISON STUDIES

Significant positive findings

The following studies have all revealed a positive relationship between participation in physical activity and body satisfaction:

Schultz (1961) found that physically fit high school girls had better body images than unfit girls. Snyder and Kivlin (1975) found that 328 women who participated in a variety of sports demonstrated better body image than 275 females who did not participate in any sports. Joesting and Clance (1979) compared female runners and non-runners on the Body Cathexis Scale (Secord & Jourard, 1953) and found a difference between the mean scores with the runners having greater body satisfaction although this difference was not statistically significant. Joesting (1981) compared 37 men and women who exercised for more than 5 hours per week with 29 men and women who did not exercise at all. Using the Body Cathexis Scale a significant difference was found between the two groups and it was concluded that people who participate in regular physical exercise have greater body satisfaction. A survey conducted by Cash, Winstead, and Janda (1986) found that people who cared about fitness and health had greater body satisfaction. Ward and McKeown (1987) investigated the body satisfaction of 41 female college-aged students who were beginning an aerobic dance course (mean age 20,0 years, mean height 163,2m, mean weight 56,4kg). Using a modified version of the Body Cathexis Scale, it was found that only 32% of the sample expressed negative body cathexis, with body fatness, weight, hips, thighs and stomach having the greatest dissatisfaction. No posttest measures were made. The authors suggest that if the results are indicative of females who are attracted to physical fitness activities, it seems that primarily lean individuals with positive body images are the participants. If this is the case then individuals who would supposedly benefit the most

(overweight and low body satisfaction) are not being attracted to exercise. Similar findings were made by Petrie (1993) and Warren, Stanton, and Blessing (1990). In a study conducted by Seggar, McCammon, and Cannon (1988), the participants were intercollegiate athletes and participants in intramural sports who were compared with students from introductory sociology classes. They found the average number of hours of exercise per week to be significantly related to body satisfaction as measured by the Body Cathexis Scale. Cok (1990) found that participants in physical activities were more satisfied with their bodies than were non-participants. They made use of the Body Image Satisfaction Questionnaire (Berscheid, Walster & Bohrnstedt, 1973). Five hundred and fifty five subjects (boys and girls) were administered the questionnaire on one occasion. Significant differences in body image satisfaction among age groups were not found although physically active girls in the 15-16 age group were more satisfied with their breasts than girls in other age groups. Adame, Radell, and Johnson (1991) also investigated body image in 39 women enrolled in modern, ballet and jazz dancing courses and 120 students enrolled in an introductory personal health course. Using a shortened version of the Body Self-Relations Questionnaire (BSRQ)(Winstead & Cash, 1984) they found dancers scored more positively on BSRQ physical fitness and health domains but there was no difference on the appearance domain. A significant correlation between physical fitness and health was found with the dancers but not the non-dancers. Finkenberg, DiNucci, McCune, and McCune (1993) compared people participating in vigorous and less vigorous activities using the Body Esteem Scale. They found that the means of two of the female subscales (sexual attractiveness and physical condition) were positively associated with participation in vigorous activity. No corresponding increase in the weight concern factor was found. The authors claim that given the great cultural pressures to meet an ideal standard, even women

who participate in active exercise are dissatisfied with their weight even though they may possess more positive attitudes toward their physical condition.

No significant findings

The following studies found no significant relationship between exercise and body satisfaction:

Furst and Tennebaum (1984) found no significant difference between the body satisfaction of athletes and non-athletes as measured by the Body Cathexis Scale. Davis (1990a) found no difference in body satisfaction between exercisers and non-exercisers as measured by the body dissatisfaction subscale of the Eating Disorder Inventory (Garner & Olmsted, 1984). Adame, Johnson, Cole, Matthiason and Abras (1990) found no significant differences in body satisfaction as measured by the Body Self-Relations Questionnaire (BSRQ) in women participating in three different levels of exercise, although only the physical fitness domain of the BSRQ was analysed. Davis and Cowles (1991) found that for women, the degree to which they exercised in aerobic training or in their own self-styled exercise program was not associated with body dissatisfaction as measured by the Body Image Inventory (Myers, Zivian, Kirkland, & Zager, 1985).

Significant negative findings

The following studies found a negative relationship between exercise and body satisfaction:

Smith (1980) suggests that athletic activity is associated with dissatisfaction with body weight and body image. Davis and Cowles (1989) compared a control group of 64 university students, a thin build athlete group consisting of 64 females who participated in gymnastics, synchronised swimming, swimming, diving, figure skating, long distance

running or ballet, and a normal build athlete group consisting of 64 females who participated in hockey, basketball, sprinting, downhill skiing or volleyball. They found that female athletes participating in sports that generally encourage a thin build show greater weight concerns, more body dissatisfaction as measured by the Eating Disorder Inventory, and more assiduous dieting than athletes who, although they are engaged in regular and prolonged physical activity, are not faced with these demands. Women in the control group were not satisfied either but they were not rated as thin.

2.7.2 PRE AND POST TRAINING STUDIES

Significant positive findings

The following studies have all revealed a positive relationship between participation in physical activity and body satisfaction:

Collingwood (1972) conducted a study of 50 male subjects aged 18-22 years undergoing rehabilitation. Half the males participated in a standard rehabilitation program while the other half, in addition, participated in an hour of hard physical training every day for 4 weeks. The groups were matched for emotional and behavioural difficulties. The training group showed a significantly greater change in physical fitness and body image than the control group did. Tetting (1989) found that men and women joining a fitness centre listed increasing fitness, losing weight and managing stress as their motives. However, reasons for continuing with exercise shifted to “feeling great” and ‘looking better’, improving and maintaining fitness and health and losing/controlling weight. This shift in focus from physiological to psychological benefits underscores the effects of regular exercise on body satisfaction. Salusso-Deonier and Schwarzkopf (1991) conducted a longitudinal study with 52 women and 23 men volunteers from a university fitness improvement class and 41

women and 9 men volunteers from classes unrelated to exercise. Involvement in the fitness class yielded a significant improvement in body cathexis as measured by the Body Cathexis Scale for both men and women. They concluded that exercise may contribute to improved body satisfaction regardless of the initial level of body satisfaction. The fitness group displayed greater improvements on all variables except on the weight and hips. The authors suggest that women have lower body satisfaction than men because of cultural scripting where women are socialised to focus more on physical attractiveness than physical competence. This study provides support for Sonstroem and Morgan's (1989) framework wherein exercise involvement may be related to improvements in a person's sense of physical competence and, thereby, improvements in body cathexis. They conclude that while regular exercise has the potential for improving body cathexis for males and females, improvement of body cathexis as a whole may not improve satisfaction with weight. Tucker and Maxwell (1992) conducted a pretest-posttest quasi-experimental design with an experimental group of 60 female subjects and control group of 92 females. Experimental subjects participated in a 15-week, twice weekly weight training intervention, while subjects in the comparison group did not participate in any weight training activities. With pretest scores controlled, the weight trainers had significantly high body cathexis post-test scores than the comparison group as measured by the Body Cathexis Scale. Bosscher (1993) conducted a study with 12 male and 12 female depressed psychiatric patients who either participated in a running treatment group or a mixed physical exercise group. The running sessions were 45 minutes long, three times per week for 8 weeks. The mixed physical exercise group consisted of relaxing low intensity physical activities for 50 minutes twice per week for 8 weeks. An extra 45 minute session per week of breathing and relaxation exercises was included in the mixed physical exercise program to attain a corresponding

period of contact between experimenter and subject. Using the Body Cathexis Scale it was found that the running group improved significantly on body satisfaction from pre-test to posttest but there was no significant change in the mixed physical exercise group. No follow-up was conducted. A recent study by Theron, Van Vuuren, and Potgieter (1995) examined the effect of aerobic exercise on body image. The experimental group consisted of 20 female students and the control group of 25 female students between the ages of 18-24 years. The experimental and control groups were matched with regard to body cathexis as measured by the Body Cathexis Scale. The experimental group participated in an aerobic exercise program for an hour each day, 3 days per week for 9 weeks. At posttest, the experimental group had improved significantly with regard to body cathexis while no significant differences between pre and posttest body cathexis scores were evident in the control group.

No significant findings

The following studies found no significant relationship between exercise and body satisfaction:

Puretz (1978) studied the changes in body image scores of college students using the Body Cathexis Scale. The experimental group consisted of a group of dancers enrolled in beginning ballet and modern dance classes and the comparison group consisted of a group of non-dancers. Over a 15-week period, no significant changes in body image scores occurred. Eickhoff, Thorland, and Ansorge (1983) studied 39 women volunteers between the ages of 19-36 years enrolled in a YWCA aerobic dance class. Of the 39 women, 19 were randomly assigned to postpone participation. The experimental group of 20 females participated in a 10-week course taught by one of the investigators which they attended

three times per week for 50 minutes. They were instructed to participate at an intensity which they could tolerate. Using the Physself subscale of the Tennessee Self-Concept Scale (Fitts, 1965), no significant differences were found between the pre and post test means for both the groups. When the groups were divided into low and high fit categories, a significant difference was found between the pre-test and post-test means for the low fit experimental groups. The authors suggest that any changes in the subjects in this study may be due to influences not common to all i.e. psychologically healthy subjects. It is also suggested that more vigorous exercise is required for psychological improvement of high fit subjects. Ben-Shlomo and Short (1986) conducted an experimental study with 15 females. Subjects were matched by age, weight and fitness level and then randomly assigned as arm training, leg training and control groups. The arm training group exercised on the modified cycle ergometer and the leg training group on the stationary cycle ergometer three days per week for 6 weeks (18 training sessions). The Body Cathexis Scale was administered before and after the physical training program and a group by trials interaction almost approached significance ($p < 0,1$) showing that exercise did have an effect in the desired direction on body satisfaction although it was not statistically significant. Netz, Tennebaum, and Sagiv (1988) conducted a study of 11 men (mean age 60,4 years) and 13 women (mean age 55,8 years) who participated in a 12-week training program three times per week for an hour. The training consisted of 20 minutes of training and callisthenics, 15-35 minutes of jogging/brisk walking and 5 minutes of cool down. Training intensity was guided by the target of 70% of predicted maximal heart rate and modified by individual's perceived exertion, discomfort or pain. Body satisfaction was measured as a subscale of the Tennessee Self-concept Scale. Participants scored relatively high on pre and posttest measures and no significant change in score was found. Unfortunately there was no control group in this

study. Melnick and Mookerjee (1991) conducted a pretest-posttest study on 17 men and 10 women enrolled in an advanced weight training course three times per week for 1 hour for 16 weeks. The control group consisted of 66 men and 14 women enrolled in a theory course called 'Physiological perspective of sport and exercise' twice per week for 1 hour for 16 weeks. The Body Cathexis Scale was used as a measure of body satisfaction and both groups scored similarly before the courses began. The experimental group had significantly higher scores on 24 of the 46 items after 16 weeks but there was no significant improvement in overall body cathexis score.

Significant negative findings

The following studies found a negative relationship between exercise and body satisfaction: Poretz (1982) replicated her previous findings but not only did she find no improvement as a result of modern dance experiences as measured by the Body Cathexis Scale, but also that the more modern dance one participates in the poorer one's body image becomes. This she accounted for by saying that more improvement in technique might mean more awareness of one's faults and an increased concern with technical proficiency.

The relationship between body image and exercise participation is thus not at all clear. Several studies have found greater body satisfaction in females who exercise compared to those who do not, others have found greater body dissatisfaction in people who exercise compared to those who do not and some studies have found no difference in body satisfaction between exercisers and non-exercisers. Comparison of these studies is difficult for several reasons and these methodological shortcomings will be discussed individually below.

Sampling

Both males and females are included in these studies which makes it difficult to interpret any results as research has demonstrated that body satisfaction in males and females is quite different (Furnham & Greaves, 1994). The age of subjects is also omitted and research has shown that body satisfaction varies with age (Altabe & Thompson, 1993). Race and socio-economic status needs to be controlled for as cultural differences (Pumariega, Edwards, & Mitchell, 1984) as well as class differences (Herzog & Copeland, 1985) in body image exist. The existence of other pathology may also confound results and thus it is impossible to make comparisons between psychiatric patients and normal people with regard to body satisfaction.

The definition of exercise

The terms exercise addiction, exercise dependence, compulsive exercising and obligatory exercise have been used interchangeably in the literature and studies investigating these degrees of exercise (Pasman & Thompson, 1988) cannot be compared to assiduous exercisers or those who exercised for recreational interest. It has also been suggested that athletes who participate in different sports will differ in their degree of body dissatisfaction (Pasman & Thompson, 1988). Exercise is a broad term which can be broadly be divided into aerobic and anaerobic exercise. Aerobic exercise is a method of conditioning the cardiorespiratory system with the use of a variety of activities that create an increased demand for oxygen over an extended period of time and includes activities such as aerobic dancing, jogging, swimming etc. Anaerobic exercise does not require a lot of oxygen but

involves short spurt and high energy activities. Weight lifting is an example of anaerobic exercise. These activities also vary in the amount of social interaction, relaxation, physical strain and competition to mention just a few and thus it is impossible to compare them. Furthermore, the intensity, frequency and duration of participation in an exercise program also varies and this needs to be controlled for in order to make comparisons of studies. Hellison (1970) demonstrated that the duration and intensity of the training program can have differential effects. It was found that a group of 27 male students who had undergone 4 training days a week had better body images and a group of 22 male students who trained only twice a week showed no alteration in body image.

Use of various body satisfaction measures

The studies reviewed use different instruments to measure body satisfaction, some of which do not have adequate psychometric properties.

The Body Cathexis Scale (Secord & Jourard, 1953) has been widely used in research on social and sport psychology for assessing body esteem (Berscheid, Walster, & Bohrnstedt, 1973; Dasch, 1979; Gary & Guthrie, 1972; Joesting & Clance, 1979; Lai, 1984; Rohrbacher, 1973; Schwab & Harmeling, 1968; Tucker, 1982; 1983a). These studies either used the original scale of 46 items or more recent studies utilised a 40- item version. Wylie (1979) claims the Body Cathexis Scale to be the only body esteem instrument which is objectively scored and possesses reasonable reliability and validity (Balogun, 1986; Franzoi & Shields, 1984; Tucker, 1981; 1983b; 1985). The instrument, however, evaluates body esteem based on a single score obtained from responses to questions about various body parts or processes. Since the development of the Body Cathexis Scale, studies have

suggested that the assumption of unidimensionality is seriously questionable (Fisher, 1964; Gunderson & Johnson, 1965). Cash (1994) examined the structure of attitudinal body image by performing a factor analysis of 11 instruments measuring body image. A distinction between evaluative or affective and cognitive-behavioural investment components was made. The evaluative component refers to cognitive appraisals and associated emotions associated with one's appearance. The investment component refers to the salience of, attention paid to and the behavioural management of one's appearance. Cash emphasises the fact that attitudinal body image is not a unitary construct but is influenced by both evaluation and investment. Various researchers have noted that past studies investigating the effects of exercise on body esteem have generally not made use of measures that assess the multidimensional nature of the attitudinal body image construct (Franzoi & Herzog, 1986; Franzoi & Shields, 1984). Franzoi and Shields (1984) suggested that people evaluate their bodies in terms of distinct dimensions and do not just make global assessments. From their factor analytic work they developed the Body Esteem Scale consisting of 23 items taken from the original Body Cathexis Scale and 16 new items. They found the most salient dimensions for females to be Sexual Attractiveness, Weight Concerns and Physical Condition and for males to be Physical Attractiveness, Upper Body Strength and Physical Condition. Balogun (1986) suggests that "it is plausible that Franzoi and Shields' Body Esteem Scale is more valid than the 40-item Body Cathexis Scale" (p. 933). The use of the Body Esteem Scale has been recommended in preference to the use of other body attitude measures due to adequate data on its reliability, validity and socially desirable response bias (Franzoi, 1994; Robinson, Shaver & Wrightman, 1991).

Experimental design

It is important to critically examine such studies as many do not deal with psychological changes related to physical fitness changes. Rather most examine differences on psychological variables between fit and unfit groups and normal and abnormal groups. Many also do not record fitness effects and thus are better classified as sports participation studies. It is thus not sound to compare studies of physical fitness with sports participation studies. Only pre and post training studies offer the most valid experimental approach to the question of physical activity effects on body satisfaction. In comparison studies, where for example athletes are compared to non-athletes, the independent variable is subject defined so that a causal relationship between physical activity and body satisfaction cannot be demonstrated. Selection factors (e.g. participation in athletics) make it impossible to answer the question of whether people with better body images beforehand are attracted to physical activity or whether participation in physical activity results in greater body satisfaction. For example, when comparing the body satisfaction of athletes and non-athletes, one does not know whether participation in athletics resulted in the participants having greater body satisfaction than the non-participants or alternatively, whether the participants had greater body satisfaction beforehand and as a result of this were attracted to participating in the sport.

The choice of control group

Double-blind experimental studies cannot be carried out in exercise research because both the experimenter and the subjects know that exercise has been prescribed. Possibly a 'blind' rater could do the post assessment if the subjects are told not to disclose their group status.

The experimental group develops expectations and has regular contact with a leader whereas a control group that receives no treatment or is wait-listed for the exercise program can become demoralised and thus does not form an adequate control group for the exercise group. A comparison group which receives another treatment or placebo other than exercise would form a more appropriate control group.

The relationship between exercise participation and body satisfaction is an important area of research which may have potentially valuable implications for the treatment of body image disturbance in both normal and eating disordered populations. The methodological shortcomings mentioned above have, however, to be incorporated into future research before findings in this area can be taken seriously or considered as having any value.

2.8 THE THEORETICAL LINK BETWEEN EXERCISE AND BODY SATISFACTION

It is not sufficient to identify relationships between variables. A theoretical framework which outlines the mechanism through which the two variables are connected is required. Good research must identify relationships and then apply a theoretical model or models to attempt to explain the pathways involved in that relationship. Changes in the body as a result of exercise participation might reasonably be expected to alter one's body esteem which is highly correlated with and might be expected to radiate to self-concept.

Allport (1963) believes that body image is a fundamental part of self-image. A correlation between body image and the self-image was found by Secord and Jourard (1953) of 0,66 in women and 0,58 in men. A strong relationship has also been found between exercise and self-concept (Folkins & Sime, 1981; Hughes, 1984). Sonstroem and Morgan (1989) propose a model which suggests that exercise has a positive effect on self-esteem through

the positive effect it has on body esteem. This model which the authors claim to be temporary, incomplete and modifiable will briefly be explained. The model is vertically arranged in order of increasing situational generality starting with physical self-efficacy at the base and global self-esteem at the top of the hierarchy (see figure 1).

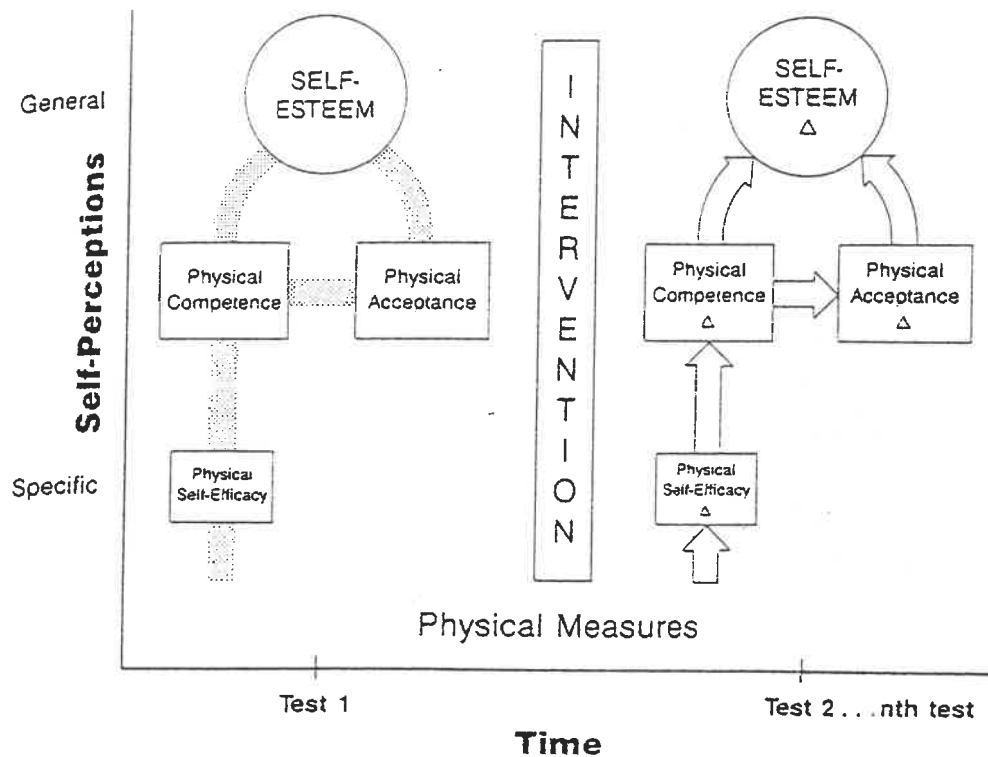


FIGURE 1: PROPOSED MODEL FOR EXAMINING THE LINK BETWEEN EXERCISE PARTICIPATION AND BODY SATISFACTION (Sonstroem & Morgan, 1989, p. 333)

The lower level elements form part of the higher level elements and are considered instrumental in bringing about change to higher level concepts of self. The horizontal dimension consists of 2 points in time separated by an exercise intervention program. While

the authors claim that time is flexible, the recommended ACSM guidelines suggest a program of 15-20 weeks before any physical training effects are evident (ACSM, 1978 cited in Sonstroem & Morgan, 1989) as the broader traits are relatively stable. The model focuses on self-esteem enhancement through the generalisation of perceived competencies developed at fitness activities although Sonstroem (1984) suggests that other agents, such as personal or social factors which may be associated with the program, may bring about changes in self-esteem. Sonstroem and Morgan (1989) claim that these agents can easily be incorporated into their model. At the lowest level are physical measures which consist of data collected from physical tests which provide objective evidence of increasing fitness which results in the development of feelings of competence which then generalise. As the participants engage in greater amounts of exercise they become better able to monitor their responses to exercise and construct improved personal self-efficacy judgements. Physical self-efficacy represents the lowest level of competency judgements developed at specific exercise activities. These feelings generalise to broader perceptions of the body's abilities such as physical competence which represents the next level. Physical competence is a general evaluation of the self as possessing overall physical fitness. This feeds into the next component which is physical acceptance. This refers to an individual's body satisfaction which is an important aspect of self-concept. Dickstein (1977) has suggested that participation in exercise will impact on self-esteem to the extent that success or failure at the physical activity is important to the individual. This model has received empirical support through a pilot study (Gemma, Osborne, & Sonstroem, 1988) and other studies (Salusso-Deonier & Schwarzkopf, 1991). The model is also compatible with the idea suggested by several authors (Heaps, 1972; Leonardson, 1977; Leonardson & Garguilo, 1978; Sonstroem, 1976) that both objective and subjective physical fitness can have an effect on

body satisfaction. These authors suggest that subjectively held factors mediate the body image / physical activity relationship and that changes are associated with the perception of improved fitness rather than with actual changes in physical fitness. While this model provides an explanation for the way in which exercise impacts on self-esteem, it at the same time accounts for the way in which exercise impacts on body satisfaction, although further empirical testing is warranted. There may also be other mechanisms which mediate the physical activity / body satisfaction relationship as illustrated by the following study.

Desharnais, Jobin, Cote, Levesqu, and Godin (1993) conducted a study with 24 men and 24 women who participated in a 10-week 90 minute training session three times per week. The training consisted of group activities such as jogging, aerobic dancing, swimming pool games and soccer. The subjects were randomly allocated to two groups both of which participated in the training program but one group was made to believe that the training would benefit their psychological well-being and aerobic capacity and were constantly reminded of this. The other group was only told that it would benefit their aerobic capacity. The Rosenberg Self-esteem Scale (Rosenberg, 1965) was administered at the beginning, at 4 weeks, at 7 weeks and on completion of the program. The experimental group improved on self-esteem significantly more than the control group. The measures of aerobic capacity at maximal effort reflected similar increases in fitness levels for both groups. Also frequency, duration and format of training sessions were identical for the two programs as were the exercise leaders and group context. Satisfaction measures collected upon program completion were similar for both groups. This study suggests that a placebo effect may be involved within the exercise-psychological enhancement connection and that physical fitness is not related to psychological improvement and that psychological improvements cannot be

attributed to psychosocial components inherent in the exercise program. Satisfaction derived from participation in physical activities may also be another mediating variable (Furst & Tennebaum, 1984).

2.9 SUMMARY

Given the flawed nature of the research in the literature regarding the relationship between exercise participation and body satisfaction, further research is required which reinvestigates this relationship taking into account some of the methodological shortcomings discussed above and which considers possible underlying mechanisms.

2.10 THE PRESENT STUDY

The present study will reinvestigate the relationship between participation in exercise and body satisfaction. The study will be limited to women for several reasons. Firstly, body satisfaction and the direction of this satisfaction differs between men and women (Cash, Winstead, & Janda, 1986; Franzoi & Shields, 1984; Miller, Linke, & Linke, 1980; Silberstein et al., 1988). Secondly, women are particularly vulnerable to body dissatisfaction and this has been linked to the current socio-cultural emphasis on female appearance and thinness (Rodin, 1992; Silberstein et al., 1988). The study will focus on white females from an upper class high school as the literature reviewed above suggests that this population is at the greatest risk of developing body dissatisfaction (Attie & Brooks-Gunn, 1989). The evidence with regard to adolescent populations is far more scant and the research that exists is retrospective rather than interventionist in nature (Norris, Carroll & Cochrane, 1992). This study will specify aerobic dancing as the form of exercise participation. Aerobic dancing was designed by Jacki Sorenson (1974). It consists of a

rhythmic mixture of hopping, jumping, skipping, running, sliding, stretching and some dance steps and is designed to improve cardiorespiratory endurance. Participants are encouraged to use their own style and exercise at their own intensity as skill and intensity are not emphasised. Studies of aerobic dancing have found significant changes in body composition, VO_{2max} , resting heart rate and submaximal heart rate (Durrant, 1975; Mass, 1976; Rockefeller & Burke, 1979) but only one study could be found which considered the effects of aerobic dancing on body satisfaction (Eickhoff, Thorland, & Ansorge, 1983).

Following from the literature reviewed above, the hypotheses of the present study to be tested are:

- 1.) The body satisfaction of the experimental group participating in an aerobic dancing program will improve significantly more than the body satisfaction of the comparison or control groups.
- 2.) The perceived physical fitness of the experimental group will improve significantly more than the perceived physical fitness of the comparison or control groups.
- 3.) Body satisfaction will improve significantly only in subjects who display a significant improvement in perceived physical fitness.

CHAPTER 3

METHODOLOGY

3.1 SUBJECTS

Access was obtained to a school in an affluent area in Natal following an interview with the school principal. The standard eight group of 159 females was initially assessed. Subjects were selected on the basis of being European, having no subjective reported history of being treated for an eating disorder or thought they had an eating disorder, and high socio-economic status. To rate the socio-economic status of subjects the method used by Bhana (1981) was used whereby either paternal or maternal occupation was used. Occupations were divided into two broad classes namely: 'white collar' or 'blue collar' which were consequently regarded as belonging to 'high' or 'low' socio-economic grouping. 'High' group included persons whose occupations included accountants, doctors, lawyers, teachers, business owners, and clerks amongst others. 'Low' socio-economic grouping resulted from occupations including work of a manual nature (skilled, semi-skilled or unskilled) such as labourers or factory workers.

The experimental group consisted of 20 females. One of the girls had to withdraw from the exercise program due to illness and was thus excluded from the study leaving 19 subjects in this group. The comparison group consisted of 20 females and the control group consisted of 20 females. The demographic statistics of the subjects are included in the results in chapter 4 (see table 1).

3.2 INSTRUMENTS

3.2.1 THE BODY ESTEEM SCALE (BES)

Description

This scale, developed by Franzoi and Shields (1984) on a young adult population, consists of 23 items taken from the original Body Cathexis Scale (Secord & Jourard, 1953) and 16 new items. They identified three dimensions on the BES which differ for men and women. The most salient dimensions for women were Sexual Attractiveness, Weight Concern and Physical Condition. For men they were Physical Attractiveness, Upper Body Strength and Physical Condition. The female Sexual Attractiveness subscale measures women's attitudes toward body parts and functions associated with facial attractiveness and sexuality. Generally these parts can only be altered through cosmetics and not exercise. The female Weight Concern subscale also relates to physical appearance and measures women's attitudes toward body parts which through exercise and control of food intake can be changed. The female Physical Condition subscale measures women's attitudes toward their stamina, strength and agility. These characteristics are not observable unless demonstrated in a particular situation where they would be assessed e.g. an athletics competition. Since 3 of the 35 items (width of shoulders, feet and arms) were highly loaded on the male and not the female subscales, they were excluded from the questionnaire used in this study. A similar study to the present one also made use of the BES and excluded the same three items for the female subscales (Finkenbergh et al., 1993). The BES for women used in this study consists of 32 items in a Likert point scale with ratings from 1 (have strong negative feelings) to 5 (Have strong positive feelings). Since schoolgoing adolescent females were used in this study, it was decided for ethical reasons to remove three of the items from the

Sexual Attractiveness dimension namely: sex drive, sex organs and sex activities. These items were replaced by one item i.e. sexual attractiveness, which summarises the above three items thus remaining scientific but at the same time seemed more appropriate and ethical for administration to adolescent high school pupils (See Appendix 1 for the BES as used).

Reliability and validity

Franzoi and Shields (1984), using 331 males and 633 females enrolled in undergraduate courses, found the female BES to have good reliability with alpha coefficients of 0,78 for Sexual Attractiveness, 0,81 for Weight Concern and 0,82 for Physical Condition. Responses for each subscale are thus reasonably internally consistent. They also report the convergent validity to be adequate since moderate correlations ranging from 0,19 to 0,35 were obtained between female BES scores and scores from Rosenberg's Self-Esteem Scale (Rosenberg, 1965). Discriminant validity for female subscales is also reported by Franzoi and Shields. They compared 11 females diagnosed as suffering from anorexia nervosa and 88 non-anorexic females. It was predicted that the anorexic women would differ significantly from the non-anorexic women only on the Weight Concern subscale since anorexia nervosa is an eating disorder in which restricted food intake and an obsession with weight control are central features (Bruch, 1962). As predicted the only difference between the two groups was on the Weight Concern subscale (Wilke's Lambda = 0,86, $p < 0,001$; canonical correlation = 0,37).

Franzoi and Herzog (1986) conducted a further study examining the convergent and discriminant validity of the BES. One hundred and fifty male and 193 female students

(mean ages of 19 and 18,4 years respectively) enrolled in undergraduate psychology courses had to complete a 10-item Self-esteem Scale (Rosenberg, 1965), a Body Consciousness Questionnaire (BCQ) (Miller, Murphy & Buss, 1981), answer questions concerning time per week spent in aerobic and anaerobic exercise, food intake and rate their attractiveness compared to their peers. Significant positive correlations were found between female BES subscales and self-esteem (Sexual Attractiveness: 0,21 , $p < 0,05$; Weight Concern: 0,36 , $p < 0,01$; Physical Condition: 0,39 , $p < 0,001$). These findings support those of Franzoi and Shields (1984). A multiple regression analysis with female BES subscales found they accounted for 21,63% of variance in female self-esteem. A small yet significant correlation was found between female BES subscales and private and public body consciousness of the BCQ as predicted. A strong correlation between the female Physical Condition subscale and a body competence measure (4 items on the BCQ) was found ($r = 0,63$, $p < 0,001$). The amount of aerobic exercise correlated most strongly with the female Physical Condition subscale ($r = 0,46$, $p < 0,001$) but was not related to the female Sexual Attractiveness subscale which was expected since items in this scale cannot be altered through exercise. The percentage of time spent thinking of food as adding weight to the body correlated moderately with the female Weight Concern subscale ($r = -0,35$, $p < 0,001$) while the percentage of time spent thinking of food as supplying energy to the body correlated modestly with the female Physical Condition subscale ($r = 0,24$, $p < 0,001$). The interrelation of the subscales for males was higher than for females which supports the view of several studies that there is greater differentiation toward the body among women. It has been suggested that women judge their bodies on a part-by-part basis (Fisher, 1964; Goldberg & Folkins, 1974).

Robinson, Shaver and Wrightman (1991) favourably evaluate the BES and recommend its use over other body attitude measures due to data on reliability and validity but point out that gaps remain in the assessment of the BES with regard to test-retest data and information on any socially desirable response bias. Franzoi (1994) acknowledged this need for research and using 73 male and 145 female undergraduate psychology students demonstrated fairly high reliability over a 3 month period of BES subscales for males and females. For the female subscales reliability coefficients were: Sexual Attractiveness $r = 0,81$; Weight Concern $r = 0,87$; Physical Condition $r = 0,75$ ($p < 0,001$). With regard to socially desirable responding, Franzoi found little evidence to suggest that any of the BES subscales is susceptible to unrealistically denying negative self-characteristics but there was a slight tendency to attribute positive self-characteristics. Franzoi claims that this slight tendency does not suggest problematic use of the BES since other research (Roth, Snyder & Pace, 1986) has found an attributional tendency to be associated with positive self-esteem, of which body esteem is a sub-category.

Administration and scoring

The scale is administered to respondents who are asked to respond how they feel about the various body parts, characteristics and functions listed using the given scale. Five ratings are available: 1 = have strong negative feelings, 2 = do not like, 3 = have no feelings one way or the other, 4 = am satisfied, 5 = have strong positive feelings. A minimum score of 30 and maximum score of 150 can be obtained. Franzoi and Shields (1984) report norms for the various subscales : Sexual Attractiveness $46,9 \pm 6,3$; Weight Concern $29,9 \pm 8,2$; Physical Conditioning $33,3 \pm 5,7$.

3.2.2 THE PERCEIVED PHYSICAL FITNESS SCALE (PPFS)

Description

This scale, developed by Abadie (1988), consists of 12 items on a Likert point scale which are designed to measure the respondent's perception of his/her physical fitness. Five ratings are available : Strongly agree, agree, undecided, disagree, strongly disagree (See appendix 2 for the PPFS).

Reliability and validity

Using 312 subjects (146 men and 166 women aged 21-68 years) Abadie estimated the construct validity using 2 separate samples differing in age. A significant t ratio ($P < 0,05$ and $p < 0,01$) was found for both. Concurrent validity was estimated for each factor in 2 separate samples differing in age. Acceptable test-retest reliability over 10 days (Product-moment coefficient of 0,92) was demonstrated using 111 subjects (mean age of 41 years). Using 54 adults (24 men and 30 women with a combined mean age of 33,4 years) Abadie demonstrated that the PPFS is not biased by social desirability. A non-significant product-moment correlation value of -0,15 ($P > 0,10$) was obtained between scores on the PPFS and the Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1960).

Administration and scoring

The scale is administered to respondents who are asked to rate each of the 12 items regarding their perception of their physical fitness using the given alternatives. Using the scoring key available, a minimum score of 12 and maximum score of 60 can be obtained.

3.2.3 EXERCISING QUESTIONNAIRE

This questionnaire was used by Davis et al. (1990). It lists 10 reasons why people participate in physical activity and requires respondents to rate each reason according to personal importance using a 4 point scale. Ratings ranges from 1 (extremely unimportant) to 4 (extremely important). No reliability and validity data are available (See Appendix 3 for the exercising questionnaire).

3.2.4 DEMOGRAPHIC QUESTIONNAIRE

In order to control for extraneous variables data regarding the subjects' age, sex, race, weight, height, history of eating disorders and parents' occupation (indicator of socio-economic status) was collected. Questions regarding dieting habits and the frequency, duration and type of regular exercise participated in were also collected (See Appendix 4 for the demographic questionnaire).

3.2.5 BODY MASS INDEX (BMI)

The BMI was calculated from weight measured on an electronic digital scale , and height using a standard metal tape rule. Bray (1978) defines BMI as weight (kg) divided by the height squared (m^2). According to Bray the normal limit for females is a BMI of 19-24. Underweight is below the lower limit of the normal BMI with hospitalisation of a person usually occurring when they reach a BMI of 13. Overweight is above the upper limit of normal BMI with the classification of obesity for a BMI greater than 30. The correlation of BMI with other techniques for measuring body fat ranges between 0,7 and 0,8 (Bray, 1978).

3.3 PROCEDURE

The experimental design of the study included a pre-intervention, intervention, post-intervention and follow-up procedure.

3.3.1 PRE-INTERVENTION

During their vocational guidance lessons at school in the vocational guidance classroom, 159 standard 8 pupils had their weight measured using a digital scale and their height measured using a standard metre rule. The demographic, BES, PPFS and reasons for exercising questionnaires were then administered by the counsellor. At the end of the questionnaires the pupils were asked to indicate whether they would like to participate in some research which might involve going to aerobics for a month or watching videos on exercising once a week for a month. Following the pre-training procedure, the 60 subjects were assigned to 3 groups which were matched for age, weight, height, socio-economic status, BMI, BES scores and PPFS scores. The 3 groups were then randomly assigned to the exercise (experimental), video (comparison) and control group options.

3.3.2 INTERVENTION

Prior to training, the 20 subjects in the exercise group were required to take consent forms home to their parents/guardian to sign which explained the requirements of the research and which indemnified the school, university and participating health club from any injury or loss of possessions incurred whilst participating in the research (See Appendix 5).

The exercise group (n=19) attended sponsored aerobic dance classes at a specific health club for a minimum of three times per week for 4 weeks. The subjects were encouraged to

participate at an intensity which they could tolerate and increase during progression of the program. They were shown by the aerobic instructors how to take their pulse counts, done periodically during each aerobic class. For an age of 15 years they were advised to try maintain their pulse counts between 22-27 beats in a 10 second range. The aerobic dance classes were approximately 60 minutes in duration consisting of a 10 minute warm up, 40 minutes of dancing and 10 minute cool down. An exercise roster had to be maintained for the month and this was collected at the end of the month as an objective measure of attendance.

The comparison group (n=20) was required to watch a video on exercise once a week, for half an hour for 1 month in the vocational guidance classroom at school. A different video was shown each week and there was no discussion surrounding the contents of the video. The school counsellor attended all the sessions and kept an attendance register. The control group (n=20) was instructed to continue with their exercise habits as normal.

3.3.3 POST-INTERVENTION

The post-intervention assessment procedure was identical to the pre-intervention assessment procedure but the demographic questionnaire differed slightly and the reasons for exercising questionnaire was omitted (See appendix 6). There was also a change in the number of subjects in the comparison group (n=19) but not in the exercise (n=19) or control (n=20) groups.

3.3.4 FOLLOW-UP

An 11-week follow-up assessment procedure was conducted which was identical to the post-intervention procedure except for the demographic questionnaire which differed slightly (See appendix 7). Unfortunately the follow-up data was collected in the week preceeding the vacation when there was a high rate of absenteeism and the subjects were not cooperative with completing questionnaires so the number of subjects in the exercise (n=16), comparison (n=17) and control (n=14) groups decreased.

3.4 STATISTICAL ANALYSIS

SPSS (SPSS, 1988) was the statistical package used to analyse the data. A multiple correlation was used to analyse data collected on all 159 girls before selection for the research was done. Pre-intervention differences between the 3 groups were analysed by one-way analyses of variance. Post-intervention differences were analysed by two-way analyses of variance with repeated measures on the time factor. A reliability check using Cronbach-alpha was conducted on the Body Esteem Scale and its three subscales. A correlational analysis was conducted with BES scores and PPFS scores. A multiple regression analysis was conducted to investigate which variables accounted for the greatest variance in BES scores of the exercise group at posttest. An investigation of BES items was conducted to see which parts were rated lowest and highest as well as an investigation of reasons for exercising at pretest.

CHAPTER 4

RESULTS

This section will present a brief description of the results obtained in the study. These results are discussed, section by section, in chapter five. The first statistical procedure to be considered is a reliability check of the Body Esteem Scale used in this study. Following this the data of all 159 females initially assessed before the subjects were selected will be analysed using correlational analysis. Examination of the outcome measures of the three groups at pretest will be conducted to ensure that the groups are satisfactorily matched at pretest. The data of the three groups at pretest, posttest and follow-up will then be analysed using a 2-way univariate ANOVA with repeated measures on the time factor. The final statistical procedure conducted is a correlational analysis of BES scores and PPFS scores. The chosen level of significance is $p < 0,05$. Since the SPSS output is voluminous, it is not included but is available on request.

4.1 RELIABILITY OF THE BODY ESTEEM SCALE

The first statistical procedure conducted was a reliability check of the Body Esteem Scale and its three subscales using Cronbach-alpha. At pretest the Alpha Coefficient for the 30 item BES scale was 0,80 , for subsale 1 (sexual attractiveness) it was 0,64 , for subscale 2 (weight concern) it was 0,82 , and for subscale 3 (physical condition) it was 0,79. At posttest the Alpha Coefficient for the 30 item BES scale was 0,85 , for subsale 1 (sexual attractiveness) it was 0,68 , for subscale 2 (weight concern) it was 0,89 , and for subscale 3 (physical condition) it was 0,84. In view of the very satisfactory reliability at pre and

posttest and the fact that several cases were lost at follow up, it was decided not to run a reliability check at follow up.

4.2 CORRELATIONAL ANALYSIS OF PRE-SELECTION DATA

There was a significant positive correlation between PPFS score and the number of hours of reported exercise per week ($r = 0,36$; $p < 0,001$) and between PPFS score and BES score ($r = 0,57$; $p < 0,001$).

4.3 PRE-INTERVENTION LEVELS OF THE OUTCOME MEASURES

Pre-treatment scores were compared to investigate initial between-group inequalities on the dependent variables (body satisfaction, perceived physical fitness, number of exercise hours). One-way analyses of variance revealed that subjects in the three different groups did not differ significantly from one another on any measure taken prior to treatment except age. The mean difference in age between the comparison and control groups is statistically significant ($F_{2,56} = 6,06$; $p < 0,01$). The difference is however small (0,4 years) and therefore it is not likely that this mean difference will confound the interpretation of the other results (see Table 1).

TABLE 1: DESCRIPTIVE CHARACTERISTICS OF THE THREE GROUPS AND THE TOTAL SAMPLE AT PRETEST

	EXERCISE (n=19)		VIDEO (n=20)		CONTROL (n=20)		TOTAL (n=159)	
	MEAN	(SD)	MEAN	(SD)	MEAN	(SD)	MEAN	(SD)
AGE (yrs)	15,21	(0,29)	15,44	(0,49)	15,04	(0,27)	15,21	(0,41)
HEIGHT (m)	1,62	(0,06)	1,65	(0,08)	1,66	(0,08)	1,74	(0,94)
WEIGHT (kg)	54,00	(4,80)	56,30	(7,99)	55,70	(8,77)	52,80	(7,17)
BMI (kg/m ²)	20,68	(2,13)	20,69	(2,49)	20,20	(2,48)	22,33	(14,20)
BES	89,47	(11,17)	90,65	(11,48)	90,45	(11,19)	98,79	(15,81)
PPFS	36,26	(6,07)	36,20	(5,62)	35,50	(4,90)	37,94	(6,26)
EXHR	4,37	(2,65)	4,75	(4,34)	4,45	(2,58)	5,43	(4,48)

NOTE:

BMI = Body Mass Index (Weight / Height squared)

BES = Body Esteem Scale score at pretest

PPFS = Perceived Physical Fitness Scale score at pretest

EXHR = Number of hours of exercise per week at pretest

4.4 INTERVENTION EFFECTS

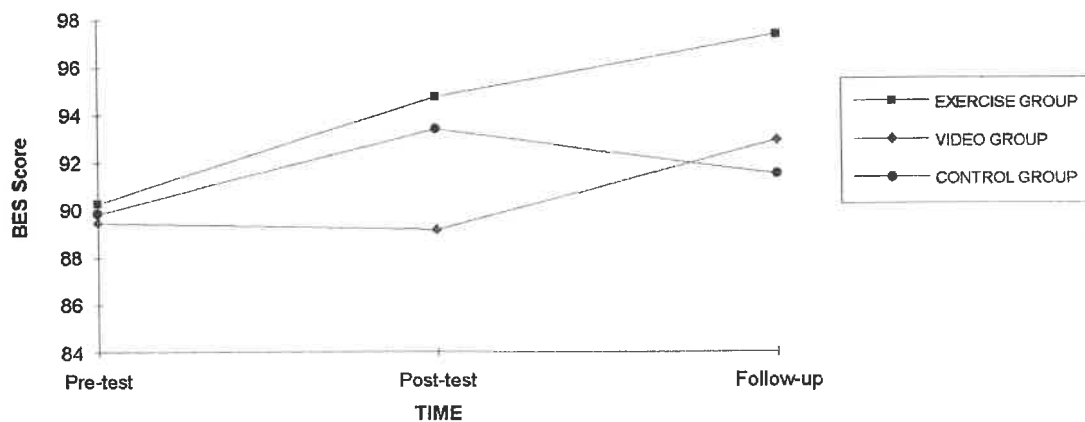
The means achieved from pre-training to follow-up are presented in tables 2-8. Differences between the three conditions for body satisfaction, perceived physical fitness etc. were analysed by 2 way ANOVA's with a 3x3 design (3 groups x 3 times). SPSS output is voluminous, and repeated measures analyses in addition give a selection of tests but in what follows only the significances for group, time and the interaction will be presented. The next few pages present the results of the 2 way ANOVAS on the intervention affects of the above variables. For the purpose of clarity, a single page will be devoted to each of the results.

In the case of Body Esteem Scale total score, neither group ($F_{2,38} = 0,55$; $p > 0,05$), time ($F_{2,76} = 2,39$; $p > 0,05$), nor group by time interaction ($F_{4,76} = 0,72$; $p > 0,05$) was statistically significant (see table 2 and figure 2).

TABLE 2: BODY ESTEEM SCALE TOTAL SCORE

GROUPS	TIME					
	TIME 1	SD	TIME 2	SD	TIME 3	SD
EXERCISE (n=16)	90,25	11,80	94,75	14,76	97,38	11,98
VIDEO (n=13)	89,46	11,64	89,15	10,61	92,92	7,61
CONTROL (n=12)	89,83	11,73	93,42	11,90	91,50	12,22

FIGURE 2: COMPARISON OF BODY ESTEEM SCALE TOTAL SCORES FOR THE GROUPS ACROSS TIME

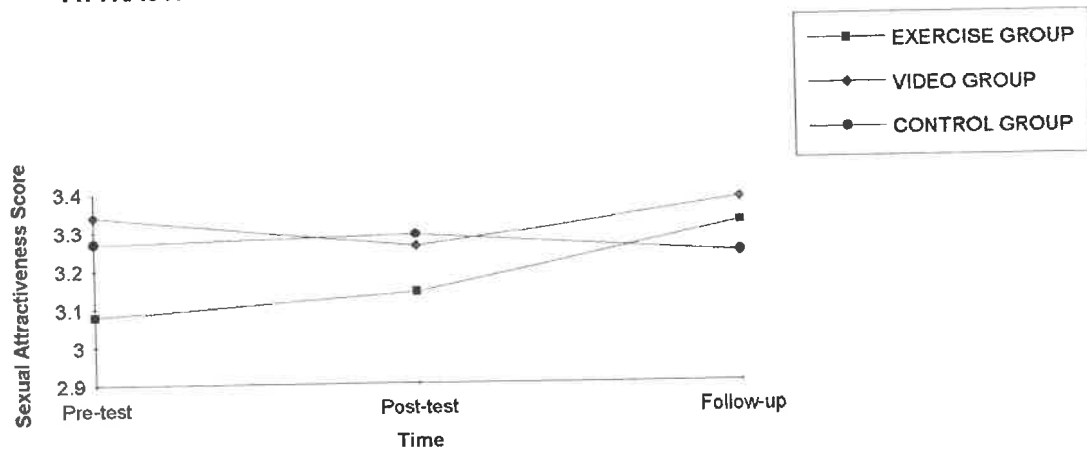


In the case of the Body Esteem Scale factor 1 (sexual attractiveness), neither group ($F_{2,43} = 0,64$; $p > 0,05$), time ($F_{2,86} = 1,44$; $p > 0,05$), nor group by time interaction ($F_{4,86} = 1,32$; $p > 0,05$) was statistically significant (see table 3 and figure 3).

TABLE 3: BES - FACTOR 1: MEAN SEXUAL ATTRACTIVENESS SCORE

GROUPS	TIME					
	TIME 1	SD	TIME 2	SD	TIME 3	SD
EXERCISE (n=16)	3,08	0,42	3,14	0,39	3,32	0,37
VIDEO (n=16)	3,34	0,47	3,26	0,53	3,38	0,51
CONTROL (n=14)	3,27	0,37	3,29	0,33	3,24	0,42

FIGURE 3: COMPARISON OF MEAN BES FACTOR 1 : SEXUAL ATTRACTIVENESS SCORE FOR THE GROUPS ACROSS TIME

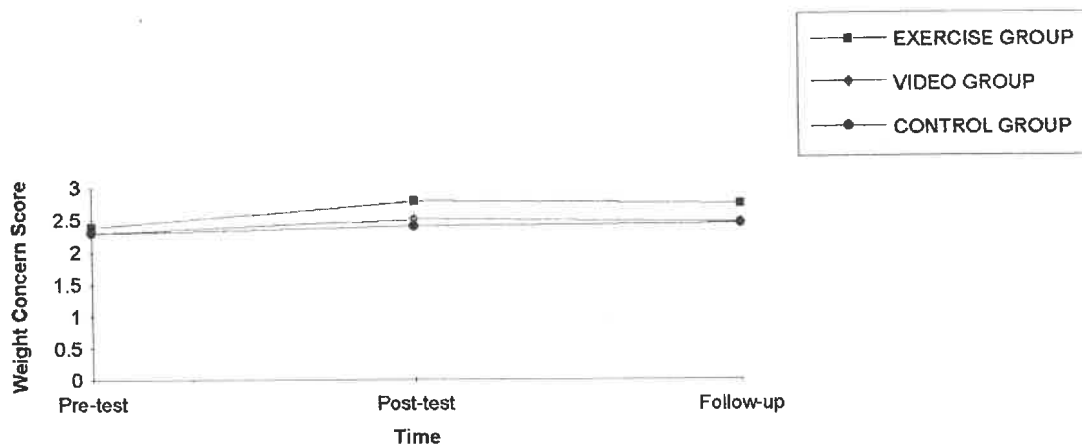


In the case of the Body Esteem Scale factor 2 (weight concern), neither group ($F_{2,40} = 0,66$; $p > 0,05$) nor group by time interaction ($F_{4,80} = 0,49$; $p > 0,05$) was statistically significant but time was statistically significant ($F_{2,80} = 3,94$; $p < 0,05$) (see table 4 and figure 4).

TABLE 4: BES - FACTOR 2 : MEAN WEIGHT CONCERN SCORE

GROUPS	TIME					
	TIME 1	SD	TIME 2	SD	TIME 3	SD
EXERCISE (n=16)	2,39	0,67	2,80	0,93	2,76	0,96
VIDEO (n=14)	2,30	0,56	2,52	0,74	2,47	0,60
CONTROL (n=13)	2,30	0,65	2,41	0,82	2,45	0,79

FIGURE 4: COMPARISON OF MEAN BES FACTOR 2 : WEIGHT CONCERN SCORE FOR THE GROUPS ACROSS TIME

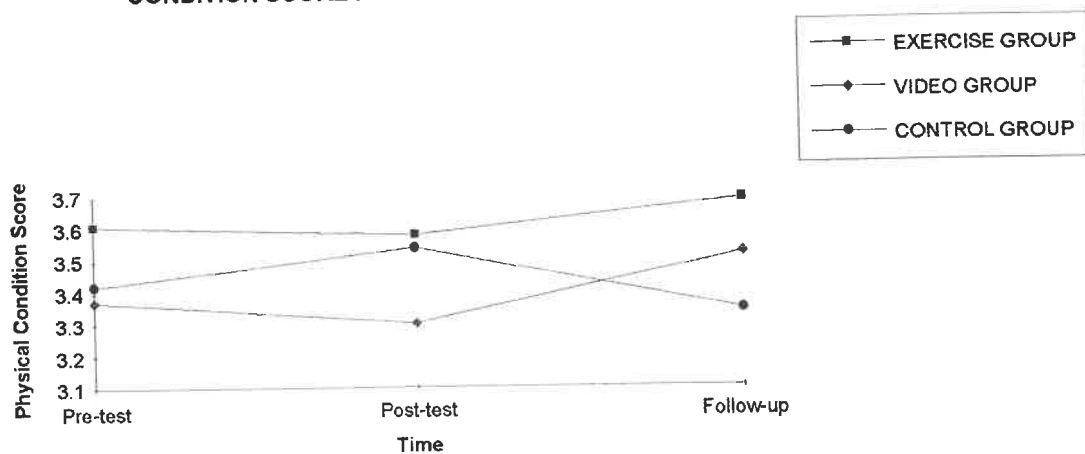


In the case of the Body Esteem Scale factor 3 (physical condition), neither group ($F_{2,40} = 1,01$; $p > 0,05$), time ($F_{2,80} = 0,21$; $p > 0,05$), nor group by time interaction ($F_{4,80} = 1,00$; $p > 0,05$) was statistically significant (see table 5 and figure 5).

TABLE 5: BES - FACTOR 3 : MEAN PERCEIVED PHYSICAL CONDITION SCORE

GROUPS	TIME					
	TIME 1	SD	TIME 2	SD	TIME 3	SD
EXERCISE (n=16)	3,61	0,46	3,58	0,58	3,69	0,42
VIDEO (n=15)	3,37	0,70	3,30	0,69	3,52	0,57
CONTROL (n=12)	3,42	0,55	3,54	0,51	3,34	0,64

FIGURE 5: COMPARISON OF MEAN BES FACTOR 3 : PERCEIVED PHYSICAL CONDITION SCORE FOR THE GROUPS ACROSS TIME

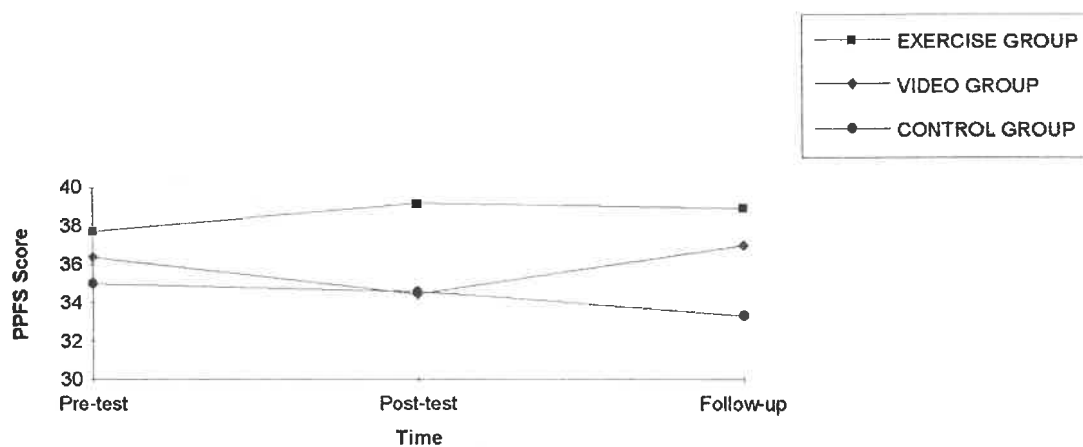


In the case of the Perceived Physical Fitness Scale score, neither group ($F_{2,42} = 2,51$; $p > 0,05$), time ($F_{2,84} = 0,17$; $p > 0,05$), nor the interaction of group by time ($F_{4,84} = 2,16$; $p > 0,05$) was statistically significant (see table 6 and figure 6).

TABLE 6: PERCEIVED PHYSICAL FITNESS SCORE

		TIME					
		TIME 1	SD	TIME 2	SD	TIME 3	SD
GROUPS	EXERCISE (n=15)	37,80	5,10	39,20	5,76	38,93	6,04
	VIDEO (n=16)	36,38	5,98	34,44	6,14	37,00	6,25
	CONTROL (n=14)	35,00	5,35	34,57	5,76	33,36	6,50

FIGURE 6: COMPARISON OF PERCEIVED PHYSICAL FITNESS SCALE SCORES FOR THE GROUPS ACROSS TIME

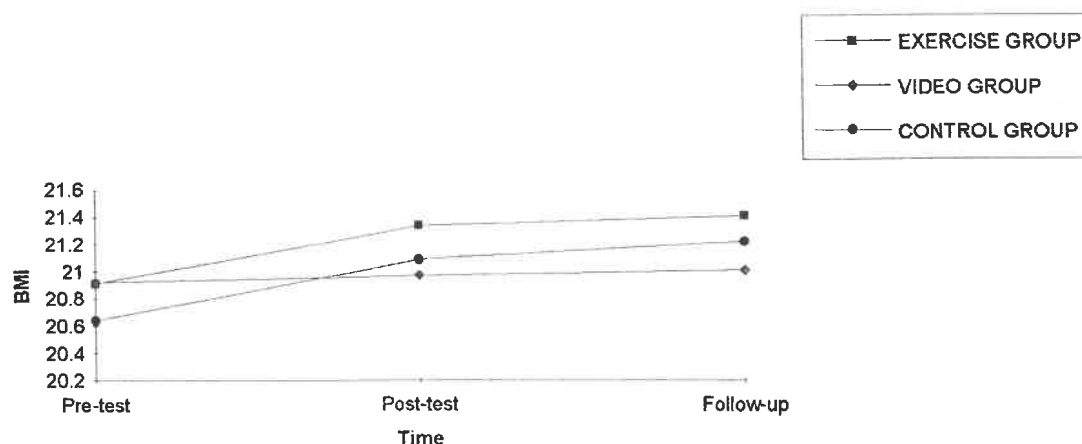


In the case of Body Mass Index, neither group ($F_{2,43} = 0,06$; $p > 0,05$) nor the interaction of group by time ($F_{4,86} = 1,19$; $p > 0,05$) was statistically significant , but time was statistically significant ($F_{2,86} = 7,45$; $p < 0,001$) (see table 7 and figure 7).

TABLE 7: BODY MASS INDEX

GROUPS	TIME					
	TIME 1	SD	TIME 2	SD	TIME 3	SD
EXERCISE (n=16)	20,91	1,82	21,34	1,79	21,41	1,81
VIDEO (n=16)	20,92	2,44	20,97	2,50	21,01	2,22
CONTROL (n=14)	20,64	2,77	21,09	2,89	21,22	2,71

FIGURE 7: COMPARISON OF BODY MASS INDEX FOR THE GROUPS ACROSS TIME

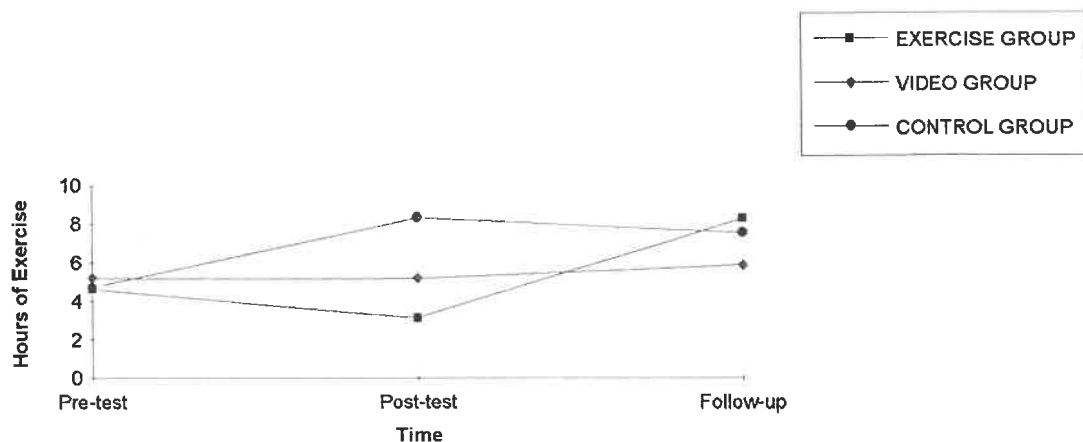


In the case of number of hours of exercise, neither group ($F_{2,43} = 0,42$; $p > 0,05$), time ($F_{2,86} = 1,55$; $p > 0,05$), nor the interaction of group by time ($F_{4,86} = 1,07$; $p > 0,05$) was statistically significant (see table 8 and figure 8).

TABLE 8: HOURS OF EXERCISE

		TIME					
		TIME 1	SD	TIME 2	SD	TIME 3	SD
GROUPS	EXERCISE (n=16)	4,63	2,83	3,13	0,34	8,31	17,01
	VIDEO (n=16)	5,19	4,76	5,19	4,45	5,88	5,18
	CONTROL (n=14)	4,71	2,16	8,36	8,30	7,57	7,69

FIGURE 8: COMPARISON OF NUMBER OF HOURS OF EXERCISE FOR THE GROUPS ACROSS TIME



4.5 CORRELATIONAL ANALYSIS

A significant positive correlation was found between the BES score at pretest and the PPFS score at posttest ($r = 0,45$; $p < 0,01$) and not between the between the BES score at pretest and the PPFS score at pretest or at follow-up. A significant positive correlation was found between the BES score at posttest and both the PPFS score at posttest ($r = 0,45$; $p < 0,01$) and the PPFS score at follow-up ($r = 0,40$; $p < 0,01$) and not with PPFS score at pretest. There was a significant positive correlation between the BES score at follow-up and the PPFS score at pretest ($r = 0,41$; $p < 0,01$), the PPFS score at posttest ($r = 0,55$; $p < 0,001$) and the PPFS score at follow-up ($r = 0,62$; $p < 0,001$).

CHAPTER 5

DISCUSSION

In this chapter the results from chapter 4 will be discussed section by section following which some general comment, limitations of this study and recommendations for future research will be made.

5.1 RELIABILITY OF THE BODY ESTEEM SCALE

A reliability check of the Body Esteem Scale using Cronbach-alpha (see section 4.1) suggests that the scale has good reliability which confirms the findings of Franzoi and Shields (1984) and Franzoi and Herzog (1986). Thus, the results of the present study are not due to variance produced by the Body Esteem Scale used.

5.2 CORRELATIONAL ANALYSIS OF PRE-SELECTION DATA

The correlational analysis of the data collected before subjects were selected (see section 4.2) suggests that no relationship exists between body satisfaction and exercise participation since a significant correlation was not found between BES scores and number of hours of physical exercise. This supports the findings of Furst and Tennebaum (1984), Davis (1990a), Adame et al. (1990), and Davis and Cowles (1991). None of these studies made use of the Body Esteem Scale and they all differ with regard to the type of exercise subjects were involved in. As suggested earlier, these factors contribute to the difficulty in comparing studies.

Significant correlations in pre-selection data were found between PPFS score and number of hours of exercise and between PPFS score and BES score. The first correlation seems logical in that the more time one spends exercising, the more likely one will perceive one's physical fitness to be high. The second correlation provides support for the third hypothesis in this study, namely, that an increase body satisfaction will accompany an increase in perceived physical fitness. This finding provides further support for the model proposed by Sonstroem and Morgan (1989).

More importantly, such a correlational analysis does not imply any causal links between exercise participation and body satisfaction and has thus, limited utility. More valuable results can be obtained from longitudinal research. It must be noted that the results of the correlational analysis in this study may not be accurate due to a problem with the wording in the original demographic questionnaire with which subjects experienced difficulty. Many subjects interpreted the question regarding number of hours of exercise *per week* as number of hours of exercise *per day* and as a result the data collected may not be accurate.

5.3 PRE-INTERVENTION LEVELS OF OUTCOME MEASURES

Analysis of the pre-intervention levels of the outcome measures for the three groups (see section 4.3) suggest that the groups were well matched on all variables except age. As previously noted, the mean difference in age between the comparison and control group is 4,8 months which is small, although significant, and is thus unlikely to confound the interpretation of the other results. Since the three groups were well matched before the intervention program, any significant results found following the intervention are not confounded by any pre-intervention differences.

5.4 INTERVENTION EFFECTS

Each of the variables in the two-way univariate ANOVA (see section 4.4) will now be discussed. For the BES score there was no significant changes for group, time, nor the interaction of group by time which suggests that exercise participation does not significantly effect body satisfaction and thus the first hypothesis of this study is not supported. This finding is, however, similar to those of Ben-Shlomo and Short (1986), Eickhoff, Thorland and Ansorge (1983), Melnick and Mookerjee (1991), Poretz (1982), who found no significant effect of exercise on body satisfaction using a pre and post training experimental design. The study by Eickhoff et al. (1983) was the only one of the above studies which examined the effect of participation in aerobic dance classes three times per week for ten weeks. Their study, however, made use of the Physself subscale of the Tennessee Self-Concept Scale and not the Body Esteem Scale as used in this study. Examination of figure 2 (p.45), however, does illustrate trends in the expected direction in that the body satisfaction of the exercise group improved more than that of the comparison and control groups although the improvement was not significant. On the whole, however, all groups appeared to improve slightly with regard to body satisfaction and this could perhaps be attributed to the Hawthorne effect. Since the experimenter used to be a teacher at the school at which the present study was conducted, many of the subjects knew the experimenter and knew that they were participating in her research, and this may have resulted in them trying to help and please her through their responses. It is interesting to note that the control group increased slightly at posttest and then decreased at follow-up with regard to body satisfaction. This could perhaps be due to the fact that through social contact with the exercise group and video group, the control group became aware of the fact that they were not exercising or

watching exercise videos and as a result became more dissatisfied with their bodies. This will be referred to as the social drift argument. A limitation of this study which could have affected the results is the fairly large difference in the time spent between the exercise and video groups (12 hours vs 2 hours of 'treatment'). One would expect the exercise group to have improved more than video group due to the larger duration of 'treatment' received.

The results suggest that while there was a slight increase in body satisfaction following participation in the exercise program, the overall improvement was not significant. These results lend support to the claim by Fisher and Cleveland (1958) that body image (which consists of body satisfaction and body size estimation) consists of stable relatively unchanging aspects and not the claim by Lerner (1967) who emphasised the more immediate temporary aspects of body image and suggested that body image is in constant flux and reformation. These two claims are not in conflict according to Schilder (1950) who considers body image to have many layers, the underlying layers being more general and stable while the superficial layers of immediate body image are more easily affected by changes. It is argued that it is the immediate layers of body image that are affected initially by physical activity. It is also possible that the gradual increase in body satisfaction of all the groups may also be related to the subjects' own perception of the program as valuable in fulfilling their specific needs.

Another possible explanation is that actual physical fitness does mediate the relationship between exercise participation and body satisfaction. This would support the findings of Theron, Van Vuuren, and Potgieter (1995) who found significant improvement in body

satisfaction as measured by the Body Cathexis Scale and physical fitness following participation 3 times per week for nine weeks in an aerobic exercise program, although they do not specify the type of aerobic exercise. This explanation can be seriously questioned when one considers the ACSM guidelines (cited in Sonstroem & Morgan, 1989) that it would take 15-20 weeks of participation in an exercise program three times per week before any physical training effects are evident.

Several investigators have shown that individuals in poor initial physical and/or psychological condition tend to show the most physical and psychological changes following participation in physical activity programs (Ben-Shlomo & Short, 1986; Folkins, Lynch & Gardner, 1972; Gutin, 1966; Hellison, 1970; Layman, 1974). This study, in which the body satisfaction of all groups at pretest were in the average range (see table 1), supports the findings of Morgan (1982) indicating that it is uncommon for people scoring within elevated (ceiling effect) or normal ranges of body image to experience changes during physical activity programs.

There was no significant change in BES factor 1: Sexual attractiveness with regard to group, time and the interaction of group by time. Participation in exercise thus had no significant effect on perceived sexual attractiveness. This supports the suggestion by Franzoi and Shields (1984) that parts of the body mentioned in this subscale can generally be altered through cosmetics and not exercise and thus participation in exercise would produce little change in perceived sexual attractiveness score on the BES. Examination of figure 3 (p.46) suggests similar findings to that of figure 2 (p.45) in that a trend is evident in the desired direction although improvement is not significant. The Hawthorne effect is evident once

again as well as the decrease in sexual attractiveness scores for the control group after the intervention which was accounted for above as perhaps attributable to social contact with the other two groups receiving some sort of treatment.

With regard to the BES factor 2: Weight concern, neither group nor the interaction of group by time was significant but time was significant. This suggests that all the subjects when considered together became more satisfied with their weight over the course of the intervention program and at follow-up. This is indicative of a strong Hawthorne effect. Examination of figure 4 (p.47) indicates a slight, although insignificant increase in weight satisfaction for the exercise group compared to the other two groups. The finding that participation in exercise does not have a significant effect on satisfaction with one's weight supports the findings of Finkenberg et al. (1993) that participation in vigorous activity did not correlate with increased satisfaction with one's weight as measured by the BES subscale 2 (weight concern).

For the BES factor 3: Physical condition, neither group, time, nor the interaction of group by time was significant. Participation in exercise did not result in a significant improvement in perceived physical condition. This finding is in contrast to that of Finkenberg et al. (1993) who found a significant correlation between vigorous exercise activity and the physical condition score of the BES. If figure 5 (p.48) is examined, however, a trend in the desired direction is evident which suggests that the exercise group improved more than the comparison and control groups with regard to perceived physical condition and this elevation became more marked at follow-up which suggests that had the intervention program been longer, findings may have approached statistical significance. Once again a

Hawthorne effect is evident as well as a marked decrease in the control group score following the intervention which was described above as the social drift argument.

With regard to PPFS score, neither group, time, nor the interaction of group by time was significant. This suggests that participation in exercise did not result in increased perception of one's physical fitness and thus the second hypothesis of this study was not supported. This could perhaps be accounted for by the fact that the intervention program was only 4 weeks long and was perhaps too short for the participants to feel that they were becoming fitter. Examination of figure 6 supports this argument since the exercise group experienced greater improvement in perceived physical fitness than the comparison or control groups. Once again the control group deteriorated after the intervention time providing support for the social drift argument proposed above.

For body mass index, neither group nor the interaction of group by time was significant but time was significant. This suggests that exercise participation did not result in a significant change in body mass index. The subjects together did increase in body mass index over the course of the study. Examination of figure 7 suggests that the exercise group did increase in body mass index more than the control or comparison groups although this change was not significant. This could perhaps be explained by the fact that when exercising one builds muscle which weighs more than fat and as a result one's mass may increase which in turn would increase one's body mass index. It is worth suggesting that women who exercise and are concerned about their weight should be encouraged to have their body fat percentage calculated rather than weighing themselves to obtain feedback about the effect of their exercise participation.

With regard to number of hours of exercise, neither group, time, nor the interaction of group by time was significant. This finding adds reliability to the findings of the study since the subjects were matched at pretest on this variable and did not change significantly over the course of the study which suggests that findings cannot be attributed to a sudden change in exercise habits in any of the groups. Examination of figure 8 (p.51) does suggest a significant increase in the exercise group regarding reported number of exercise hours at follow-up which may be indicative of the fact that they became more aware of the benefits of exercise participation although only 38% (n=16) of the exercise group continued with the aerobic dance classes after the intervention. It must be again brought to the reader's attention that there was a problem with the wording of the question regarding number of hours of exercise and thus the data collected may not be accurate.

For many of the above scales, an upward trend was evident in the figures (figures 2 to 8, p. 45 to 51) in the results section, and this upward trend became more marked after posttest which suggests that it is possible that this elevation would continue since Theron et al. (1995) found significant psychological effects due to exercise on a 9-week program. One would have expected the exercise group's scores on several of the variables to decrease following completion of the intervention since several authors have reported withdrawal symptoms such as feeling fatter and having negative feelings about themselves following cessation of exercise (Glasser, 1976; Harris, 1981; Robbins & Joseph, 1985).

5.5 RELATIONSHIP BETWEEN BES AND PPFS SCORES

A correlational analysis of PPFS and BES scores at pretest, posttest and follow-up revealed several significant positive correlations which provide support for the third hypothesis of this study i.e., that a relationship between perceived physical fitness and body satisfaction exists. This provides support for Sonstroem and Morgan's (1989) model in which perceived physical fitness is a mediating variable between exercise participation and body satisfaction. An additional analysis was conducted and following a multiple regression analysis to investigate which variables accounted for the greatest variance in BES score of the exercise group at posttest, it was found that PPFS score at posttest accounted for 24,03% of the variance ($p < 0,001$). This finding provides further support for the third hypothesis of this study.

5.6 OTHER INTERESTING FINDINGS

Additional exploratory investigations were conducted and some interesting findings were noted. When the BES items of all the subjects were examined, it was found that the subjects consistently rated satisfaction with thighs, followed by buttocks, the lowest and health and appearance of eyes the highest at pretest, posttest and follow-up. This supports the findings of Davies and Furnham (1986).

When considered together the subjects in this study rated their most important reason for exercise at pretest as to keep fit, closely followed by to lose weight. This finding is similar to those of Davies and Furnham (1986) who found that at 12 years females exercise mainly to lose weight, at 14 years a slightly higher proportion use exercise for toning, at 16 years

more for weight reduction and at 18 years for toning. Frederick and Ryan (1993) found that only two out of three motivation factors were related to positive psychological outcomes, namely interest/enjoyment and competence. Body-related motivation was associated with greater motivation and anxiety. This study is supported by several other studies which have demonstrated that body dissatisfaction is positively associated with exercising for weight loss and tone reasons and exercising for pleasure and health reasons to be positively associated with higher self-esteem (Cash, Novy, & Grant, 1994; Field & Steinhardt, 1992; McDonald & Thompson, 1992). These findings could perhaps account for the fact that, in the present study in which the subjects rated their reasons for exercising as being primarily to keep fit and to lose weight, participation in exercise did not result in a significant improvement in body satisfaction. It has been argued by Leon et al. (1993) that the fitness movement, with its redefinition of the ideal female body characterised by thinness and shapely muscles, may be contributing to the increased incidence of eating disorders. The implication is that anyone who works out and applies effort can achieve the lean looking ideal and is thus worthy of pride and admiration. The inability to achieve the 'aerobic instructor look' as a result may leave an individual feeling defeated, ashamed, desperate and dissatisfied with their body. This implies that if exercise is to be considered as a treatment for body satisfaction, careful attention needs to be paid to the reasons an individual has for exercising and to trying to change these from losing weight in order to look like the aerobic instructor, to exercising for pleasure and health reasons.

Possibly the results suggest that in a type of physical activity like aerobic dance classes where popular attire places a great deal of emphasis on the physique, women perhaps become more critical of their bodies when they compare themselves to others. The

phenomena of self-presentational concerns has not been thoroughly examined in exercise settings. Tucker and Maxwell (1992) argue that weight training is perhaps superior to aerobic activity in improving psychological health because of the noticeable physical changes which tend to result from regular training and which in turn act as positive feedback mechanisms. It has been suggested by Alexander (1994) that when the pressure to be thin overrides the pressure to be fit e.g. in high-impact aerobic dance classes, individuals will be more susceptible to the development of eating problems. When the pressure to be fit overrides the pressure to be thin e.g. in road running, this will lead to disturbed attitudes and behaviours toward exercise.

5.7 LIMITATIONS OF THIS STUDY

A criticism of the present study is that it does not pay attention to individual differences in response to exercise. Kirkcaldy and Shephard (1990) consider inter-individual differences to play a role in the differential effects of exercise therapy. They claim that this can be traced to underlying differences in personality, the type and severity of initial psychological disturbance and also the relationship between the initial physical condition of the individual and the type and intensity of the prescribed physical activity. They claim that a threshold dose of exercise needs to be exceeded in order for there to be any effect, yet an excessive dose may have negative psychological and physiological consequences. Furthermore, the threshold dose and maximal safe dose of exercise treatment will vary for different individuals. Morgan (1979) stresses the importance of identifying an optimal amount of exercise (in terms of frequency, duration, intensity) in order to obtain therapeutic results. Davis (1990b) has conducted research in the field of individual differences with regard to exercise and suggests that when individuals who have a high degree of body narcissism

become involved in a regular exercise program, this tends to intensify and exaggerate weight and diet concerns and this is accentuated in individuals with a high degree of addictiveness.

Folkins and Sime (1981) suggest that future research on fitness training as a treatment strategy must pay more attention to individual differences. Individuals probably differ greatly in their ability to benefit psychologically from fitness training because of differences in beliefs, expectation and coping styles. This field of study also requires development at a theoretical level of study as it would appeal to a larger audience and have a wider application if embedded in a broader framework of psychological functioning.

While the present study took into account many of the methodological shortcomings of previous research in the area, there are several factors which prevent generalisations from this study being made. Firstly, only white females were included in this study because of cultural differences which may exist regarding the ideal body shape. There are few reports on eating disorders and body image disturbance in the 'non-white' population (Norris, 1987; Pumariega, Edwards & Mitchell, 1984) and future research needs to explore this area. Secondly, body satisfaction in females across a small age range was considered and thus results cannot be generalised to females of all ages. Thirdly, a number of subjects in the exercise (n=6), video (n=3) and control (n=6) groups were not tested at follow-up assessment. Another limitation of this study which could have affected the results is the fairly large difference in time spent between the exercise and video groups (12 hours vs 2 hours of 'treatment'). This was discussed earlier. A final criticism that can be made of this study is that the duration of the intervention was not long enough but given the financial and time limitations of the Masters degree year, this was unavoidable.

5.8 CONCLUSION

The results do not support the first two hypotheses of the present study, namely, that participation in an aerobic dancing program will result in significant improvements in body satisfaction and perceived physical fitness when compared to a comparison and control group. The hypothesis that a relationship between body satisfaction and perceived physical fitness exists, namely, that a significant improvement in body satisfaction will only occur if there is a significant improvement in perceived physical fitness, was supported by the results of this study. Trends in the desired direction were noted and given the limitations of this study which were discussed above, further research in this area is warranted since studies such as the present one offer hope of an intervention which could augment cognitive-behavioural therapy in the treatment of individuals with body image disturbance. Before exercise can be prescribed as a therapy for individuals with body dissatisfaction without reservation, more research needs to be done to provide empirical evidence for this possible intervention and on individual differences which may mediate the relationship between exercise and body image. "Optimally, cognitive-behavioural and exercise components could conceivably be integrated to form a more global approach for the treatment of body image disturbance" (Fisher & Thompson, 1994, p. 183). While such research is valuable, the body image standards to which women strive are way beyond the reach of any healthy or sensible levels of dieting or exercise (Brownell, 1991). Perhaps a more proactive approach is also warranted. This could involve education about the conflict between our cultural body ideals and physiological limitations and further research and clinical efforts need to establish reasonable goal weights for individuals and publicise them.

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APPENDIX

APPENDIX 1

1

On the following pages are listed various parts, characteristics and functions of your body. 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 feeling about one way or the other.

Consider the items following and circle the number which best represents your feelings according to the following scale, trying to be spontaneous and honest in your responses:

1 = Have strong negative feelings and wish change could somehow be made.

2 = Do not like but can put up with.

3 = Have no particular feelings one way or the other.

4 = Am satisfied.

5 = Have strong positive feelings and consider myself fortunate.

1. Body scent	1	2	3	4	5
2. Nose	1	2	3	4	5
3. Lips	1	2	3	4	5
4. Ears	1	2	3	4	5
5. Chin	1	2	3	4	5
6. Chest or breasts	1	2	3	4	5
7. Appearance of eyes	1	2	3	4	5
8. Cheeks/cheekbones	1	2	3	4	5
9. Sexual attractiveness	1	2	3	4	5
10. Body hair	1	2	3	4	5
11. Face	1	2	3	4	5

12. Appetite	1	2	3	4	5
13. Waist	1	2	3	4	5
14. Thighs	1	2	3	4	5
15. Body build	1	2	3	4	5
16. Buttocks	1	2	3	4	5
17. Hips	1	2	3	4	5
18. Legs	1	2	3	4	5
19. Figure or physique	1	2	3	4	5
20. Appearance of stomach	1	2	3	4	5
21. Weight	1	2	3	4	5
22. Physical stamina	1	2	3	4	5
23. Reflexes	1	2	3	4	5
24. Muscular strength	1	2	3	4	5
25. Energy level	1	2	3	4	5
26. Biceps	1	2	3	4	5
27. Physical coordination	1	2	3	4	5
28. Agility (active, quick)	1	2	3	4	5
29. Health	1	2	3	4	5
30. Physical condition	1	2	3	4	5

APPENDIX 2

The following statements are designed to assess your perception of your physical fitness. Please read each statement carefully, and then select one of the five alternatives by circling your choice:

SD = Strongly disagree

D = Disagree

U = Undecided

A = Agree

SA = Strongly agree

1. I am in good physical condition.	SD	D	U	A	SA
2. I need to alter (lose or gain) my weight in order to improve my physical health.	SD	D	U	A	SA
3. I am better able to walk briskly for twenty minutes than most individuals my age.	SD	D	U	A	SA
4. I am as physically strong as I need to be.	SD	D	U	A	SA
5. An object that I can lift once with slight difficulty soon becomes strenuous when I attempt to lift it repeatedly.	SD	D	U	A	SA
6. I possess greater muscular flexibility than most individuals my age.	SD	D	U	A	SA
7. I am more overweight than most individuals my age.	SD	D	U	A	SA
8. When I exercise I tire easily.	SD	D	U	A	SA
9. I am more physically fit than most individuals my age.	SD	D	U	A	SA
10. I am a very limber (flexible) individual.	SD	D	U	A	SA
11. I possess less muscular strength than most individuals my age.	SD	D	U	A	SA
12. I need to improve my present overall physical condition.	SD	D	U	A	SA

APPENDIX 3

Listed below are 10 reasons why people engage in physical activities in their leisure time. Rate each of these according to their importance to you. Circle the number which best represents your feeling according to the following scale:

- 1 = Extremely important
- 2 = Fairly important
- 3 = Fairly unimportant
- 4 = Not important at all

Reasons for exercising:

1. To feel better	1	2	3	4
2. To socialize	1	2	3	4
3. For fun	1	2	3	4
4. To lose weight	1	2	3	4
5. To improve flexibility	1	2	3	4
6. To test oneself	1	2	3	4
7. To relax	1	2	3	4
8. To learn a skill	1	2	3	4
9. To keep fit	1	2	3	4
10. For therapy (to release stress)	1	2	3	4

APPENDIX 4.

RESEARCH QUESTIONNAIRE

Thank you for completing this questionnaire. You are assured that all details will be regarded as confidential. Before turning over, please complete the following details. Thank you for your assistance.

NAME _____

CLASS _____

AGE (years and months) _____

APPROXIMATE HEIGHT _____

m

APPROXIMATE WEIGHT _____

kg

HAVE YOU EVER BEEN TREATED
FOR AN EATING DISORDER ? _____

DO YOU THINK YOU HAVE AN
EATING DISORDER ? _____

RACE GROUP* _____

FATHER'S OCCUPATION _____

MOTHER'S OCCUPATION _____

(*It is acknowledged that under apartheid legislation references to race or culture were justifiably regarded as offensive. For the purposes of this research however, this information may be useful in identifying particular culture-specific trends and health and illness patterns.)

Circle which one of the following statements best describes your general dieting behaviour:

1. I am constantly dieting.
2. I successfully diet and lose weight.
3. I rarely feel the need to diet.

How many times a week do you regularly exercise? _____

How many hours per week do you regularly exercise? _____

What type(s) of regular exercise do you do? _____

ARE YOU PREPARED TO TAKE PART IN THIS RESEARCH WHICH WILL CONSIST OF YOU EITHER HAVING TO ATTEND AEROBICS CLASSES 3 TIMES A WEEK FOR THE MONTH OF MARCH AT PLAYERS-"THE PLACE GYM" FREE OF CHARGE OR WATCHING A VIDEO ON EXERCISING 1 LUNCHBREAK A WEEK FOR THE MONTH OF MARCH ? _____

Thank you for your co-operation.

APPENDIX 5



University of Natal

Faculty of Social Science
Department of Psychology

Private Bag X01 Scottsville,
Pietermaritzburg 3209 South Africa
Telephone (0331) 2605309 Fax (0331) 2605309

Dear Parent

PARTICIPATION IN UNIVERSITY OF NATAL RESEARCH

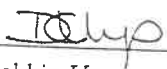
In recent years there has been an increased concern among young women about dieting, body weight and shape concerns. Research has demonstrated that an extreme weight and dieting preoccupation is a risk factor for the development of an eating disorder such as Anorexia Nervosa or Bulimia Nervosa. What is also interesting is the recent boom of the fitness industry and the increasing trend to join and work out at a health club. The relationship between these two issues has not been thoroughly investigated and warrants further research.


This research I will be doing in partial fulfilment of a Master of Science degree in Counselling Psychology at the University of Natal, Pietermaritzburg under the supervision of Mr D Wassenaar, senior lecturer at the university. The headmistress, Ms Johnstone, has agreed to have this research carried out at Westville Girls' High School.

Your daughter has expressed interest in participating in my research. She will be required to attend aerobics classes three times per week for the month of March at Players Gym - "The Place". This will be FREE OF CHARGE due to the generous sponsorship from Players Gym. If you consent to your daughter's participation, please sign the indemnity and consent form below and return it as soon as possible.

Thank you for your co-operation.

Yours sincerely


Debbie Uys


Mr D Wassenaar

I consent to my daughter _____ participating in the research. I understand that she is required to attend three aerobics classes per week at Players Gym - "The Place" for the month of March, free of charge. I will not hold Westville Girls' High School, University of Natal or Players Gym responsible for any loss of property, injury or illness that may arise from participation in the exercise program.

(Signature of parent or guardian)

APPENDIX 6

QUESTIONNAIRE - aerobics group

NAME : _____

CLASS : _____

WEIGHT : _____

DID YOU CHANGE YOUR FOOD INTAKE i.e DIET IN THE PAST MONTH ? _____

IF YES, WAS THIS BECAUSE OF THE EXERCISE WHICH YOU HAVE BEEN DOING IN
THE PAST MONTH ? _____

QUESTIONNAIRE - video group

NAME : _____

CLASS : _____

WEIGHT : _____

HAVE YOUR EXERCISE HABITS BECOME MORE / LESS / REMAINED THE SAME IN THE PAST MONTH ? _____

IF YOU HAVE BEEN EXERCISING MORE, WAS THIS DUE TO WATCHING THE EXERCISING VIDEOS ? _____

HOW MANY HOURS PER WEEK HAVE YOU EXERCISED IN THE PAST MONTH ?

DID YOU CHANGE YOUR FOOD INTAKE i.e. DIET IN THE PAST MONTH ?

IF YES, WAS THIS DUE TO YOUR CHANGED EXERCISE HABITS OR FROM WATCHING THE EXERCISE VIDEOS IN THE PAST MONTH ? _____



APPENDIX 7

QUESTIONNAIRE - aerobics group

NAME : _____

CLASS : _____

WEIGHT : _____

DID YOUR EXERCISE HABITS BECOME MORE / LESS / REMAIN THE SAME IN THE
PAST 11 WEEKS ? _____

HAVE YOU CONTINUED DOING AEROBICS SINCE YOU COMPLETED THE MONTH OF
AEROBICS FOR THE RESEARCH ? _____

HOW MANY HOURS PER WEEK HAVE YOU EXERCISED IN THE PAST 11 WEEKS ?

DID YOU CHANGE YOUR FOOD INTAKE i.e. DIET IN THE PAST 11 WEEKS ?

QUESTIONNAIRE - video group

NAME : _____

CLASS : _____

WEIGHT : _____

DID YOUR EXERCISE HABITS BECOME MORE / LESS / REMAIN THE SAME IN THE
PAST 11 WEEKS ? _____

HOW MANY HOURS PER WEEK HAVE YOU EXERCISED IN THE PAST 11 WEEKS ?

DID YOU CHANGE YOUR FOOD INTAKE i.e. DIET IN THE PAST 11 WEEKS ?

QUESTIONNAIRE

NAME : _____

CLASS : _____

WEIGHT : _____

DID YOU CHANGE YOUR FOOD INTAKE i.e. DIET IN THE PAST 11 WEEKS ?

DID YOUR EXERCISE HABITS BECOME MORE / LESS / REMAIN THE SAME IN THE PAST 11 WEEKS ?

HOW MANY HOURS PER WEEK HAVE YOU EXERCISED IN THE PAST 11 WEEKS ?
