EATING DISORDERS AND EXCESSIVE EXERCISE:

A COMPARISON OF HIGH-IMPACT AEROBICS AND ROAD RUNNING

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ABSTRACT

Excessive exercise has always been a noted characteristic of patients with anorexia nervosa. Recent research has focused on the impact of physical activities, depending on their nature, towards the susceptibility of disordered eating or excessive exercise. The present study explores the hypothesis that when the pressure to be fit overrides the pressure to be thin, this will lead to disturbed attitudes and behaviours towards exercise. When the pressure to be thin overrides the pressure to be fit, subjects will be more susceptible to the development of eating problems. Further, it is hypothesised that the prevalence of eating pathology is higher among the female subjects, while males are more inclined to be susceptible to exercising excessively.

In order to examine these hypotheses, three independent groups, matched for age and gender, were studied. High-impact Aerobics participants (n = 59) and Road Runners (n = 85) were chosen as they represented respectively: an athletic group that emphasises thinness and an athletic group that places an emphasis on fitness. A control group (n = 61) was also recruited.

In terms of the results, a statistical analysis revealed that the high-impact aerobics group reflected greater eating, weight and body shape concerns than the other two groups, while the road runners were more preoccupied with exercise concerns than the other two groups. In a gender comparison, the females were more preoccupied than males with eating, weight and body shape concerns, while both genders reported similar exercise concerns. The data suggest that road runners are not necessarily vulnerable to the development of eating disorders merely due to their physical activity.

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CHAPTER 1

SUMMARY OF CONTENTS

Excessive exercise has been a noted characteristic of anorexia nervosa ever since its earliest descriptions over a century ago. Of particular interest is the degree to which the nature of different physical activities make individuals more or less susceptible to the development of eating disorders. This study will compare the extent to which a physical activity that emphasises fitness above thinness, as opposed to one that emphasises thinness above fitness, leads to disturbed attitudes and behaviours towards eating and weight. The study will also measure across genders the incidence of eating disorders and excessive exercise.

Chapter 2 discusses the literature, with specific emphasis on the suggestion, most notably motivated by Yates, Leehey and Shisslak, (1983), that some individuals who exercise excessively might themselves have a disorder which is comparable to anorexia nervosa. Studies that discuss the similarities between anorexics and excessive exercisers are discussed, while various models that explain the link between these two groups are outlined. Studies that measured the extent of weight preoccupation and tendency towards excessive exercising were made as a function of the type of physical activity and the respective emphasis placed upon thinness and fitness. With this in mind, participants of high-impact aerobics were used to represent the former group. Literatures that studied the eating attitudes and behaviour, and obligatory exercising nature of road runners were discussed as a group primarily in pursuit of fitness. Studies that made gender comparisons were discussed, with the hypothesis that females were primarily in pursuit of thinness and males of fitness being outlined.

In Chapter 3, the methods employed in this study are discussed. This chapter includes the

aims of the study; the subjects; and the instruments used to gather data. Statistics to be used are briefly outlined.

Chapter 4 outlines the results of this study. Demographic data and descriptive statistics describe the characteristics and results of the three groups. One-way and 2-way analysis of variance tests were done, with the Tukey HSD being carried out for the purpose of making post hoc comparisons to identify between which specific groups the significant statistical differences lay. Where data could be assigned to ordinal categories, the Chi-squared test was performed to seek any significant associations between variables.

Chapter 5 discusses each group in respect of their results and comparisons are made with previous studies. The three groups are compared, with similarities and differences being highlighted. As will be done with the groups, a gender comparison will be made. Conclusions are drawn from the study, suggestions made for further research made and limitations described.

CHAPTER 2

LITERATURE BACKGROUND

2.1 INTRODUCTION

More than a century ago Lasegue (1873) and Gull (1873) both made note of overactivity in their classic descriptions of anorexia nervosa (AN). In fact, it was with Lasegue's astonishment at the liveliness and hyperactivity of anorexic patients that he was able to distinguish them from the starving Parisians who fell victim to famine during the Franco-Prussian war Vandereychen & van Deth (1990). Despite numerous other authors (Andersen & Mickalide, 1983; Beumont, Arthur, Russell & Touyz, 1994; Blinder, Freeman & Stunkard, 1970; Fichter, Daser & Postpischil, 1985; Halmi, 1974; Margo, 1987; Roberts & Elliot, 1990; Slade, 1973; Touyz & Beumont, 1986 and Touyz, Kopec-Schrader & Beumont, 1993) noting the hyperactivity of patients with AN, most appear to have viewed such behaviour as '...an interesting, but seemingly unimportant symptom of the anorexic syndrome...' (Epling, Pierce, & Stefan, 1983).

It has been suggested that some individuals who exercise excessively might themselves have a disorder which is comparable to AN. The most noteworthy proponents of this thesis, which has raised considerable interest, is that of Yates et al. (1983) and Yates (1991) who propose that 'obligatory running is a male analogue of AN'. Yates et al.'s (1983) controversial paper has drawn a parallel between a group of excessive exercisers known as 'obligatory runners' and patients with AN. Citing interviews with more than 60 marathon and trail runners, Yates and her colleagues (1983) claimed that there are underlying psychological traits shared by female anorexics and male 'obligatory' runners, including introversion, depression, inhibition of anger, high expectations, and denial. They say that 'obligatory runners' appeared to be as obsessed with diet and weight as are eating

disordered women, but they expressed the concern in terms of percent body fat, food which would enhance performance, etc. Yates (1991) noted that both obligatory runners and eating disordered women enjoyed the organizing, energizing, soothing, self-defining, and self-enhancing functions of their respective excessive behaviours, and that problems arise when they are unable to stop themselves, when they must continue to escalate their self expectations, and when they suffer the consequences of injury and inanitation.

A variety of labels have been ascribed by other authors to describe the phenomenon of 'obligatory running'. Touyz and Beumont (1986) refer to 'exercise addiction', Epling et al. (1983) speak of 'activity anorexia', while Norval (1980) chose the term 'running anorexics', and Roberts (Roberts and Elliot, 1990) the term 'anorexia athletica' to describe athletes who ran intensively. Le Grange and Eisler (1993) are concerned whether these authors are all referring to the same phenomenon, and make mention of DeCoverley Veale's (1987) argument that a more general term such as 'exercise dependence' would be preferable. Because of its theoretical neutrality, the descriptive terms, 'excessive exercise' (EXE), coined by DeBenedette (1990), and exercise dependency will be applied throughout.

Characteristics of EXE have been described by several researchers and include maintaining a rigid schedule of intense exercise; resisting temptation to lapse into non-exercise; feelings of guilt and anxiety when the exercise schedule is violated; compensatory increase in exercise to make up for lapses; pushing oneself even when tired, ill, or injured; mental preoccupation with exercise; and detailed recordkeeping on exercise (Blumenthal, O'Toole & Chang, 1984; DeBenedette, 1990; Nudelman, Rosen, Leitenberg, 1988; Yates et al., 1983; Yates, Shisslak, Allender, Crago and Leehey, 1992).

Le Grange and Eisler (1993) discuss the relationship between EXE and eating disorders for two reasons. In the first place, there are descriptive similarities between individuals who

exercise excessively and patients with anorexia nervosa. Dieting and exercise are linked in order to reduce weight which can become self-reinforcing once this activity becomes established. Many people, however, exercise in excess for reason other than reducing weight. Those individuals who exercise in excess, it can be argued, are principally concerned with the pursuit of fitness as their main objective. The second, as suggested by Kalucy, Crisp and Harding (1977), is that there might be undetected cases of individuals suffering from an eating disorder among the population of excessive exercisers. This is what has prompted Yates et al. (1983) to propose that excessive exercising and anorexia nervosa are in some way equivalent and that the two conditions are different manifestations of the same disorder. In addition, they say that identifying EXE as a distinct entity offers an explanation to the low prevalence of AN in males.

2.2 SIMILARITIES BETWEEN ANOREXICS AND EXCESSIVE EXERCISERS

Many similarities exist between individuals who are either anorexic or exercise in excess, most of which have been outlined by le Grange and Eisler (1993). The first similarity between the two groups is the single-minded sense of commitment they hold. Obligatory runners strive towards physical effectiveness, and experience guilt or depression when unable to run. It is not uncommon for such individuals to ignore any contra-indication to running when injured. The excessive exerciser is caught up in exercise to the same extent that the eating disordered woman is caught up in weight control. Yates, Shisslak, Crago and Allender, (1994) discuss this theme in terms of social-cognitive theory, looking at the perfectionistic characteristics of excessive exercisers and anorexics. Athletes, particularly long-distance runners, are seen as painstaking, systematic, hard-working individuals who persevere at any task they undertake (Owens & Slade, 1987; Yates, 1991; Yates et al., 1992). They are good at what they do, and thrive on the self-confirmation that comes with success. Social-cognitive theory claims that initial success marks the beginning of a

reciprocal feedback loop. Achieving something valuable leads to feelings of effectiveness, which makes the individual strive harder. Striving brings success, the success makes them feel even more effective, and so they try to achieve even more. By this, the reciprocal feedback loop is reinforced, with the athletes' personality traits of persistence and perfectionism making it difficult to exit the loop. Similarly, when women, or men to a lesser extent, choose to improve their appearance by dieting, some of them discover that they are very good at the task. With their exceptional will-power they are more easily or more consistently able to lose weight than most people. As they become more slim, they feel more effective, good about themselves, and motivated to continue. Eating-disordered women or men can be viewed as individuals who are unable to extricate themselves from the loop. Yates (1991) suggest that it is the persistent and perfectionistic personality traits characteristic of eating-disordered individuals (Nudelman et al., 1988) that keep them locked in the reciprocal loop.

Closely related to the first similarity is the compulsive and obsessive nature common to both groups. Compulsive athletes are generally rational individuals who act in an irrational manner when they engage in sport (Yates et al., 1992). This suggests that there are state-specific factors that influence compulsivity. In other words, the situation in which they find themselves is partly responsible for their behaviour. Davis, Fox, Cowles, Hastings, and Schwass, (1990) proposed that participation in sport enhances compulsivity. They found that when certain women engaged in a fitness programme, they developed an obsessive attitude towards weight control. As their fitness improved, they became more dissatisfied with the body and concerned about appearance, and they experienced a decrease in emotional well-being. A similar phenomenon has been described in women who diet. They became more, or less dissatisfied with their bodies. Studies on overtraining suggest that the same factor operates in male athletes. When athletes increase their training, in spite of exhaustion, some were unable to stop. Despite feelings of anger and depression, and a

disliking for what they were doing, they would, nevertheless, increase their effort or prolong their practice time (Puffer & McShane, 1992).

The third similarity sees both running and AN appearing and developing during a period of increased stress and conflict centered around self-identity (Blumenthal, Rose and Chang, 1985). In a struggle to establish an identity, adolescent girls may pursuit thinness as a 'solution' to the dilemma, by giving them a sense of control. Similarly, Yates et al. (1983) argue that 'obligatory runners' singular commitment to running appears at a time of heightened development, uncertainty and identity confusion at an older age. Steiger (1989) argues that certain cultural, biological and intrapsychic factors protect the young male from developing an eating disorder, with Yates et al's (1983) argument implying that males are subjected to analogous pressures, which present at a later stage in life. They maintain that physical effectiveness, closely related to vocational and sexual effectiveness, comes to test when careers are stable and physical decline sets in. These pressures, when combined with other aetiological factors, imply that males will develop a disorder which is closely related to AN. Sours (1980) considers the behaviour of anorexics and distance runners to represent a common 'narcissistic' effort to achieve ultimate self-satisfaction. Together with Yates (1983), he views excessive running and dieting as manifestations of the same underlying psychopathology, both harbouring underlying conflicts in identity. Through running and diet, the individual develops a sense of specialness. However, since perfection can never be realized, such efforts merely become maladaptive, and frantic attempts to achieve successes are ultimately doomed to failure.

The fourth similarity focuses on the fear of weight gain among both competitive athletes and individuals with AN. In the former, weight is controlled in order to perform at an optimal level, while in the latter it is a morbid concern of being unable to control eating and, hence, becoming fat (Davis, 1992). Researchers have shown that men and women athletes

resort to the same pathological weight control practices as do individuals with eating disorders. Such practices include fasting, diet medication, laxatives, diuretics, and vomiting (Drummer, Rosen, Heusner, Roberts & Counsilman, 1987; Hamilton, Brooks, & Warren, 1985; Hamilton, Brooks & Warren, 1986; Yates et al., 1992). Rosen, McKeag, Hough, and Curley, (1986) found that almost a third of his sample of 182 women collegiate athletes practised pathological weight control, primarily in order to improve their performance. Rippon, Nash, Myburgh and Noakes, (1988) and Rosen et al. (1986) have noted the abnormal behaviour among participants in sports which require thinness, for example, the abnormal weight-control behaviour carried out by long-distance runners to maintain an optimal performance (Smith, 1980). Hauck, and Blumenthal, (1992) recognize the importance of distinguishing between athletes participating in sports that emphasize leanness (e.g., long-distance running and gymnastics) and sports for which weight control is not a major issue.

The fifth similarity is the strong link between the two 'conditions' and depressive illness. It is widely known that many eating disorder patients have a past history of depression, or suffer concurrently from this affective disorder (Katz, Kuperberg, Pollack et al., 1984). In many cases, however, the affective symptoms are secondary to the eating disorder (Cooper & Fairburn, 1986). In a comparative study of female runners with and without amenorrhoea, Gadpaille, Sanborn and Wagner (1987) found that amenorrhoeic runners had an increased history of affective disorder and a high incidence of family history of major affective disorders. The authors do, however, acknowledge a weakness in their argument, which is the lack of clarity as to how many of the amenorrhoeic runners were suffering from AN. This study, therefore, does not tell us much about the possible links between EXE and depression.

The sixth, and final, similarity noted between AN and EXE relates to the nature of addiction.

Szmukler and Tantam (1984) argue that AN can be understood as 'an addiction to starvation', while Marazzi and Luby (1986) describe it as an 'auto-addictive process', with the themes revolving around eating and weight control. Starvation becomes the essential life goal which, at times, is known to lead to feelings of euphoria. Such feelings may be explained to the findings of Kaye, Picker, Naber and Ebert, (1982), who found an increase in beta endorphins among patients with AN. When denied the opportunity to starve, anorexic patients are known to experience feelings of guilt, irritability and anxiety. Morgan (1979), while acknowledging the physiological and psychological benefits of running, also notes its potential abuse. Based on anecdotal information, he described a negative addiction process in which runners experience withdrawal symptoms, similar to those experienced by anorexics, such as depression, anxiety and irritability if unable to run. Yates and her colleagues (1983) have documented similar feelings, including that of guilt, when 'obligatory runners' are denied the opportunity to run. They maintain that there is a parallel, explaining that in both AN and 'obligatory running' increased opiod activity is the mediating physiological mechanism which eases the 'discomfort' suffered by dieters and runners. Blumenthal and colleagues (1985) note that many runners acknowledge feeling depressed before a run, or at times when they are unable to run, and that increased physical activity can serve to alleviate a depressed mood. Although the addiction model of eating disorders and EXE is appealing, Vandereycken (1990) raises caution, saying that it is clearly an oversimplification which does not take into account the complex aetiology of eating disorders, and in all probability cannot fully explain EXE either.

Unfortunately, the descriptions of similarities between AN and EXE have largely been subjective ones, which have prompted a number of observers to call for more empirical studies (Eisler & le Grange, 1990; Krelstein, 1983; Larsen, 1983; Stewart, 1983; Wells, 1983).

2.3 MODELS FOR LINK BETWEEN ANOREXIA NERVOSA AND EXCESSIVE EXERCISE

Eisler and le Grange (1990) have proposed four models, each with different causal or aetiological mechanisms, to explain the link between EXE and eating disorders. The first model proposes that anorexia nervosa and EXE form distinct diagnostic groups. Although a large proportion of individuals with AN exercise as a means to attaining and maintaining a low weight, it is principally viewed as a means of attaining such a goal.

The second model hypothesises that anorexic patients and excessive exercisers constitute overlapping groups where EXE can lead to the development of AN. As was the case with the first model, EXE is seen as a syndrome that develops from a normal engagement in healthy exercise. This model, however, suggests that the high level of physical activity characteristic of EXE can lead to the development of an eating disorder, which could happen in one of two ways. First, it is suggested that while athletes diet excessively in order to improve their sporting performance, such dietary behaviour may induce a starvation dependence which may eventually develop into a full clinical picture of AN. The findings by Davis et al. (1990), among others (Blinder et al., 1970; Katz, 1986), lend support to some clinical evidence that avid exercise precedes dieting. They hold that exercise serves to focus exaggerated attention on one's body and on the relationship between weight and maximal performance, thus causing the development of an escalating weight control-exercise cycle.

The second mechanism is suggested from the laboratory findings of Epling et al. (1983), indicating that high levels of physical activity can have the effect of reducing food intake both in animals and humans. In support of this model is Touyz and Beumont's (1986) study of cases in which EXE was noted among individuals with AN. They found that the initial motive for weight loss among 'exercisers' was the pursuit of fitness rather

than thinness, and 60 percent commenced exercising excessively prior to engaging in dieting behaviour. In their investigation of hyperactivity among patients with AN, Kron, Katz, Gorzynski and Weiner, (1978) concluded that high levels of activity in such patients is one of the early features of AN, and not necessarily secondary in an attempt to lose weight. In 21 of their sample of 33 patients, excessive exercising appeared to antedate the onset of dieting and weight loss, while ten of the 13 patients available during follow-up had remained overactive, indicating that EXE is one of the last symptoms to subside.

The third model suggests that AN and EXE are both related to some other underlying disorder (Eisler & le Grange, 1990). This model can also be presented in two forms. First, it is hypothesised that both disorders are simply manifestations of another disorder, such as depression (Halmi, 1985). Szmukler (1987) argues that the absence of depression in many cases of AN weakens this argument. The other version of this model is that another illness might be a predisposing factor for both eating disorders and EXE. The existing data in eating disorder would support this relationship to affective illness (Szmukler, 1987).

The fourth model holds that EXE is a variant of an eating disorder. It argues that the aetiological factors (genetic, personality, familial, social) that might normally lead to the development of AN may, in some cases, lead to the development of a disorder with different manifestations. The argument presented by Yates and her colleagues (1983) are best reflected in this model, which also offers explanation to the observed sex ratio in eating disorders.

2.4 ANOREXIA NERVOSA IN MALES

Although the vast majority of individuals with AN are female, there is much literature on

its presentation among males (Beumont, Beardwood & Russell, 1972; Bruch, 1971; Burns & Crisp, 1984; Crisp & Burns, 1983; Crisp, Burns & Bhat, 1986; Fichter et al. 1979; Hogan, Huerta & Lucas, 1974; Oyebode, Boodhoo & Schapira, 1988; Steiger, 1989; Vandereycken & Van den Broucke, 1984). Of interest is Touyz et al's (1993) study of 12 male patients with AN, in which it was evident that one of the most frequently used behaviours to achieve weight loss was EXE. Fichter et al. (1985) noted that 27 out of their sample of 29 males diagnosed with primary AN included hyperactivity in their symptomology. Despite Anderson and Mickalide (1983) claiming that between 5-10% of all cases of AN are male, it is nevertheless understood that the clinical features of AN in males are remarkably similar to that in females (Crisp et al., 1986; Fichter & Daser, 1987; Oyeboda et al., 1988). Steiger (1989) explains the sex ratio in AN in terms of biological, cultural, and psychological factors, all of which contribute to females being more vulnerable than males are to the development of AN. Hsu (1989) emphasizes the role that the media has played in pressurising women towards dieting in order to control body weight and shape, thus, encouraging a 'drive for thinness'. Many authors (e.g. Fichter et al., 1985; Margo, 1987; Steiger, 1989; Yates et al., 1992) have documented that males are less concerned than females with achieving smaller body proportions, tending instead to overvalue musculature and athleticism. Cultural pressures may rather act in a way that encourages a 'drive for fitness', especially among males. Schwartz, Thompson and Johnson, (1982) have explained this to the increasing emphasis on exercise and diet in contemporary western society.

2.5 EATING DISORDERS AMONG ATHLETES

The association between exercise and eating disorders has received much attention in recent years. In part, this relationship may be the result of the relationship between body weight and optimal athletic performance in some sports. In a clinical case study

looking at malnutrition in a compulsive runner, Roberts and Elliot (1991) made a working diagnosis of 'anorexia athletica', emphasizing the close relationship that exists between eating disorders and excessive exercise. In a small sample of 16 young long distance runners, Nudel, Hassett, Gurian, Diamant and Weinhouse, (1989) found that 7 runners presented with a distorted body image and several displayed significant psychopathology. Two of the sample fulfilled the criteria for the diagnosis of AN. Several studies have reported the existence of pathogenic weight control behaviours among athletes, such as bingeing more than twice a week, self-induced vomiting, laxative, diuretic and diet pill abuse (Drummer et al., 1987; Rosen et al., 1986). The reported prevalence of eating disorders among athletes varies widely in the literature. Thornton (1990) has suggested that as many as one in four athletes may have an eating disorder. Borgen and Corbin (1987) qualified this view by suggesting that the extent of weight preoccupation and tendency towards eating disorders among female athletes varied significantly as a function of type of sport and the respective emphasis placed upon leanness in each sport. In Loosli and Benson's (1990) study of nutritional intake among athletes, they noted that ballet dancers consume an average of 350 kcal less than is recommended for normal growth and development, demonstrating the pursuit for thinness that is typical among these professionals. Beumont and colleagues (1994) noted the use of EXE among bulimics, where exercise patterns often reflect the chaotic eating behaviour. Some patients admit that they use EXE as a means of compensating for disinhibited eating, in a way not dissimilar to their use of laxatives and self-induced vomiting. The prevalent social-cognitive perspective views EXE as symptomatic of, rather than antecedent to, an eating disorder. This approach stresses that activity, like food deprivation, is used as a conscious method of weight loss for the anorexic (Garner et al., 1985). The findings made by Davis (1992) in her study of high-performance female athletes support the reports of strong pressures for female athletes to minimize body fat to low levels, and that athletes and coaches , "will do anything to improve

performance" (Zucker, Avener, Bayder, Brotman, Moore & Zimmerman, 1985, p.95).

An inverse relationship between activity and energy intake has long been known to exist. In the well known experimental starvation study by Keys and his colleagues, a number of subjects were reported to have exercised excessively during the 24 week period of food restriction (Keys, Brozek, Henschel, Mickelsen & Taylor, 1950). In laboratory experiments using animals to investigate the relationship between physical activity and self-starvation, Epling et al. (1983) and Epling and Pierce (1988) have shown that food restriction induces greater levels of activity which further serves to reduce food intake. If this research applies to humans, then they consider this crucial in maintaining the illness among a proportion of patients with AN, coining the term 'activity anorexia' for this phenomenon. Davis et al. (1990) discuss the theory of activity-based AN, explaining that during the early stages of food restriction, physical activity increases as a biologically based response to increase an animal's likelihood of finding food. Beumont and his colleagues (1994) raise caution in noting that this inverse relationship is shortlived. Given time, subjects adapt to a high level of activity and take adequate amounts of food so as to maintain their weight. However, when the increased activity takes place in a setting in which food is restricted, compensation is not possible, and there is a decrease in energy intake.

Le Grange and Eisler (1993) justifiably argue that if excessive exercisers were similar to anorexics, then it could be implied that these individuals together comprise a diagnostic entity. Blumenthal et al. (1984) investigated whether athletes and anorexics share basic personality characteristics by comparing the personality profiles of compulsive runners and anorexic patients. Their results, and those of other researchers (Hauck & Blumenthal, 1992; Nash, 1987) failed to support the contention raised by Yates et al. (1983) that there are basic similarities in personality profiles between these two groups.

The anorexic patients obtained more pathological scores than the runners on eight of the ten subscales of the Minnesota Multiphasic Personality Inventory, with depression (scale 2) and psychopathy (scale 4) being particularly prevalent within the anorexic group. In a similar study, using a battery of psychological and behavioural measures of bulimia nervosa, Krejci and his colleagues compared bulimics and obligatory exercisers (Krejci, Sarjent, Forand, Ureda, Saunders, and Durstine, 1992). They were able to conclude that the obligatory exercisers did not closely resemble the females with symptoms of bulimia nervosa. Specifically, female exercisers were not dissatisfied with their bodies, did not have the same degree of drive to be thin, did not have a distorted body image, were not overly intent on restricting sugar and fat in their diet, and were not depressed. These observed findings are consistent with prior studies of male obligatory exercisers (Blumenthal et al., 1984; Nudelman et al., 1988). In general, studies show that anorexic and bulimic patients are more emotionally disturbed than runners, and that they do not resemble the runner in many respects (Blumenthal et al., 1984; Blumenthal et al., 1985; Nudelman et al., 1988; Pasman & Thompson, 1988).

A number of studies (e.g. Blumenthal et al., 1984; Weight & Noakes, 1987) have shown that patients with AN, as a clinical group, are more disturbed than runners, and that there are few aspects in which these groups resemble one another. Sparse evidence exist to provide any support for the notion that 'obligatory running' is an analogue for AN. In their review of the literature on the subject, it has been concluded that the similarities that existed between individuals who exercise to excess and individuals with AN are outnumbered by the differences (le Grange & Eisler, 1993). Although AN has claimed recognition as a distinct entity over the last few decades (Russell, 1970), there seems to be insufficient evidence thus far to consider EXE a psychiatric entity.

Le Grange and Eisler (1993) stress the importance of differentiating between a relentless

drive towards fitness and the use of exercise to promote physical and mental health. Numerous studies have shown that vigorous physical activity is associated with reduced risk for the development of coronary heart disease (Morris, Lussier, Vaccaro, P. & Clarke, D.H., 1982). In addition to the physical benefits, there is consistent evidence that exercise has both immediate and long-term positive psychological effects (le Grange & Eisler, 1993). For example, exercise has been associated with enhanced self-esteem and self-concept (Kostrubala, 1976), and running has been associated with enhanced self-image and more positive feelings related to ageing (Porter, 1985). Exercise is also associated with a reduction in depressive symptomology (Brown, Ramirez & Taub, 1978), while acute vigorous exercise has been associated with decreases in anxiety (Berger & Owen, 1983; Morgan, 1979). Morgan (1979) introduces a cautionary note by pointing out that in many instances the commitment towards exercise far exceeds any reasonable effort to achieve physical fitness, and emphasizes the need to identify the 'optimal dosage' of exercise (frequency, duration, intensity) necessary to obtain therapeutic results.

2.6 ANOREXIA AND EXCESSIVE EXERCISE AS PATHOLOGIES

It has been maintained (le Grange & Eisler, 1993) that AN and EXE are only comparable with a degree of 'fanaticism'. That is to say, if both conditions are pathological, then the pathology resides in the intensity with which one maintains this form of adaptation. The authors reason that being intensely involved in different modes of behaviour does not necessarily imply that these behaviours are linked in any other way than the degree of fanaticism. Blumenthal et al. (1984) express the same view when they say that 'the similarities of runners and anorexic persons may be more of a metaphor than a valid assessment of their shared psychopathology' (p.523). Le Grange and Eisler (1993) claim that most researchers in this field neglect to distinguish adequately between runners in general, and the subgroup of 'obligatory runners' who might share some characteristic

with anorexic patients. They warn that, until such time, it would be premature to equate these two groups.

2.7 CRITICAL RESPONSES TO YATES' POSTULATE

Many researchers have been critical of Yates' postulate that obligatory running may be an analogue of AN, citing the lack of scientific evidence for this postulate (Krelstein, 1983; Larsen, 1983; Stewart, 1983; Wells, 1983) and the exclusion of females from the study (Schnitzer, 1983). Blumenthal and colleagues (1984) have also been critical of their conclusions, noting that there were no objective data to support their assertions, that the presented 'case histories' were in fact fictitious (which was later acknowledged), and that any behavioural similarities were superficial and not indicative of similar aetiological conditions. In a subsequent review, Blumenthal et al. (1985) proposed that AN and compulsive exercise were independent phenomena, suggesting that compulsive exercise may be a form of addictive behaviour that could have physiological and psychological determinants. Furthermore, Weight and Noakes (1987) surveyed the incidence of eating disorders in female distance runners, concluding that abnormal eating attitudes and the incidence of AN is no more common among competitive female runners than it is among the general population. Their finding tends to refute the Yates (1983) hypothesis and is in accordance with findings of Blumenthal and colleagues (1984), showing that the personality of male obligatory runners is normal and unlike that of individuals with AN. They do, however, recognize that it is the best runners who are most likely to have the physical and psychological features of AN. Krejci et al.(1992) tested the possibility that psychological traits such as negative body image, low self-esteem, preoccupation with weight, anxiety, and depression observed in patients with bulimia nervosa are analogous to those seen in women demonstrating obligatory exercise behaviour. Their results indicated that a parallel did not exist among females with symptoms of bulimia nervosa and females with obligatory exercise

behaviour.

In conclusion, it appeared that the literature reviewed here demonstrated that ever since the classification of eating disorders was first made, it was recognised that a relationship between exercise and eating disorders existed. Despite the criticism of Yates and her colleagues' (1983) suggestion of the analogous nature of EXE and AN, it did provoke a dramatic increase in the amount of research on the nature of the relationship between anorexia nervosa and EXE. What did emerge from the literature was that there are some similarities between anorexics and those who exercise excessively. Yet, despite such similarities the relationship between AN and EXE remains unclear.

CHAPTER 3

METHODOLOGY

A discussion of the literatures in the previous chapter clearly demonstrated a link between anorexia nervosa and EXE. This link remains a relevant question today, whilst the status of current research is still dogged with methodological shortcomings. Previous studies of athletes have indicated that weight and eating concerns on the one hand, and exercise concerns on the other hand, are functions of the nature of the physical activity in emphasising either fitness or thinness, or a combination of both. In addition, there is general consensus that female athletes are more susceptible to the development of eating disorders, while male athletes are more likely to exercise excessively.

To address the nature of the relationship between exercise and eating disorders, it would be interesting to assess the impact of the pursuit of thinness on the one hand, and the pursuit of fitness on the other hand, or a combination of these. Such a study would examine whether the varying emphasis placed upon thinness, fitness or a combination of both would make a difference in the development of either dietary and weight concerns, EXE concerns, or both. Two groups were selected based on their differing emphasis placed on the pursuit of fitness and the pursuit of thinness. Road Runners (RRs) represented an athletic group that emphasises fitness, while high-impact aerobics participants (HAs) represented a group that places an emphasis on thinness. These groups are then compared to a control group. The first hypothesis is that RRs will display greater exercise dependency concerns, whilst HAs will reflect a greater tendency towards dietary and weight concerns. Moreover, it is also hypothesised that females would display larger eating and weight concerns, whereas males would be more inclined

to exercise excessively.

3.1 SUBJECTS

To investigate the possible relationship between EXE and eating disorders, preoccupation with fitness and slimness and their possible interrelationship with the aetiology of eating disorders, three different groups of people were approached to take part in the study. A total of 205 subjects participated, with the vast majority coming from middle class Caucasian backgrounds. Rosen, Silberg, and Gross, (1988) developed norms for the EAT and EDI of adolescent boys and girls from three American high schools, and their results reflected no significant differences in results between the different racial groups. Consequently, no subjects were excluded from the study on racial grounds.

High-impact Aerobics members (HAs) (n = 59) who regularly attended a Health and Fitness club in the Cape Peninsula formed one group. The researcher was granted permission by the administrator of the aerobics division to approach members after completing their aerobics classes. Members from the various classes were informed that a study comparing the eating attitudes and behaviours among various athletes was being carried out by the researcher. Two hundred batteries of questionnaires were handed out to regular members of high-impact aerobics classes, who were invited to complete them at home and return them in the stamped and addressed envelope provided for them. Fifty nine subjects (43 females and 16 males) returned their completed questionnaires. One subject's questionnaires were discarded because they had not completed all the questionnaires. The age range for the female subjects (FHAs) was 18-60 years ($X = 33.6$, $SD = 12.35$), while the age range for the male subjects (MHAs) was 16-61 ($X = 35.1$, $SD = 14.80$).

Road Runners (RRs) (n = 85), who are registered, and completed a 15 kilometer road race

in the Cape Peninsula formed the second group. Subjects were approached after completing the race and explained the nature of the research, after which they were offered the battery of questionnaires in a stamped and addressed envelope. The researcher ensured that the two hundred batteries accepted by runners came from those in the front, middle and tail-end parts of the field, so as to ensure that the sample group included a balance of athletes across performance levels. Eighty five subjects (47 females and 38 males) returned their completed batteries. The age range for the female runners (FRRs) was 19-56 years ($X = 33.2$, $SD = 7.37$), while the age range for the males (MRRs) was 16-57 years ($X = 38.5$, $SD = 11.14$).

A **Control Group (COs) (n = 61)** consisted of office workers from two companies in Cape Town's southern suburbs. Individuals who either did running or high-impact aerobics on a regular basis were not included in the group. Individuals were invited by the researcher to complete the battery of questionnaires for the study, the nature of which was outlined in a brief cover letter. The majority of office workers were invited to take an extra set of questionnaires to be completed by their spouses so as to maximize the size of the control group. Sixty four completed batteries were returned, of which three were rejected because the individuals' body mass indexes fell outside the 18-26 range, indicative of possible disordered eating. The age range for the 31 females subjects (FCOs) was between 20-52 years ($X = 30.4$, $SD = 7.58$), while the male subjects (MCOs) age range fell between 20-51 years ($X = 33.0$, $SD = 9.27$).

3.2 INSTRUMENTS

The battery of four questionnaires included a cover letter that briefly outlined the nature of the study. Due to the potentially life-threatening nature of eating disorders, subjects were requested to submit their personal details so that those individuals whose scores were indicative of a serious condition could be followed up.

1. Dietary History Questionnaire (DHQ): This questionnaire identifies information pertaining to the subjects present and past dietary history.

2. Eating Attitude Test (EAT) (Garner and Garfinkel, 1979): This 40-item, objective, self-report instrument was designed to measure a broad range of symptoms relating to dieting, bulimia nervosa, AN, food preoccupation, self control of eating, and perceived pressures from others to gain weight. Questions are presented along a 6-point Likert Scale, with a possible score range from 0-120. A study by Garner and Garfinkel (1979) has shown that a cut-off score of 30 and above maximally differentiates anorexics from normal weight university students. Results of the study by Garner, Olmstaed, Bohr and Garfinkel (1982) suggest that the EAT is a reliable and valid measure of abnormal concerns about eating behaviour in both clinical and non-clinical groups. This test has been used extensively by clinicians and researchers (e.g., Eisler & Szmukler, 1985; Garner & Garfinkel, 1980; Mann, Wakeling, Wood, Monck, Dobbs & Szmukler, 1983). Despite it having been emphasised that high scores on the EAT are not necessarily diagnostic of an eating disorder in non-clinical groups, it can, nevertheless be regarded as a useful and reliable screening instrument.

3. Obligatory Running Questionnaire (ORQ) (Blumenthal et al., 1984): The ORQ is a 21-item, true/false, self-report questionnaire designed to measure compulsive exercise. Items were generated on the basis of psychological characteristics inherent to distance runners as described by Yates and colleagues at the University of Arizona Health Science Centre (Yates at al., 1983). Questions are centred around the frequency and duration of exercise, commitment to exercise, and feelings of guilt with abstinence, among other things. Although most of the existing exercise addiction scales have lacked adequate psychometric validation, scores on the ORQ were found to distinguish runners from controls (Blumenthal et al., 1984). The mean score obtained by the 43 'Obligatory

runners' in Blumenthal et al's (1984) survey was 15.6 (X = 16 for males; X = 15.5 for females). A cut-off of 15, as used by Krejci et al's (1992) in their study of 'Obligatory exercisers', has been adopted. The ORQ was designed specifically for runners, with two of the questions, namely: 'My main form of exercise is walking, jogging or running' and 'I have competed in at least one road race in the past 6 months' applying exclusively to runners. The HAs were, therefore, asked to apply the first of these two questions to 'high-impact aerobics' instead of 'walking, jogging and running'.

4. Eating Disorder Inventory (EDI) (Garner, Olmstead & Polivy, 1983; Garner & Olmstead, 1984): This is a 64-item self report scale measuring eight attitudinal and behavioural dimensions relevant to AN and bulimia nervosa. The scale consists of the following eight subscales:

1) Drive for Thinness (**DT**) indicates excessive concern with dieting, preoccupation with weight and entrenchment in an extreme pursuit of thinness;
2) Bulimia (**BU**) reflects the tendency towards episodes of uncontrollable over-eating (bingeing) followed by possible self-induced vomiting;
3) Body Dissatisfaction (**BD**) is reflected in the dissatisfaction with areas of the body associated with maturational change and shape (e.g., hips, thighs, buttocks);
4) Ineffectiveness (**IF**) assesses feelings of insecurity, a prevailing sense of inadequacy, worthlessness, feelings of not being in control of one's life, and is considered to include a component measuring negative self-evaluation;
5) Perfectionism (**PR**) is indicative of excessive personal expectations for superior achievement;
6) Interpersonal Distrust (**ID**) reflects difficulties with intimacy, relationships, communication with others and suggests a discomfort in expressing emotions;
7) Interoceptive Awareness (**IA**) expresses a confusion in identifying emotional and

bodily sensations, especially of hunger and satiety;

8) Maturity Fears (**MF**) measures the reluctance to assume adult responsibilities, and a wish to retreat to the security of the preadolescent years.

The EDI subscales 'Drive for Thinness', 'Bulimia', and 'Body Dissatisfaction' were considered the most relevant measures in terms of the aims of this study as it was expected that the scores on these subscales would give the strongest indications of a subject's preoccupation with body weight and shape, and, dieting. The test format is similar to that of the EAT (Garner & Garfinkel, 1979) where subjects respond to a 6-point Likert scale in which responses range from 1 ("always") to 6 ("never"). The most extreme "anorexic" earns a score of 3; the immediately adjacent response 2, the next response 1 and the three choices opposite the most "anorexic" response receiving no score. Scale scores are the summation of all item scores for that particular subscale. The EDI neither provides a unitary score by which to identify eating disordered individuals, nor does it differentiate between AN and bulimia nervosa. The manual provides normative data as a guide for evaluation. This study has adopted Futch, Wingard, and Felice, (1988) subscale cut-off scores which are determined by subtracting 1 standard deviation from the means of published scores of AN patients (Garner et al., 1983). This technique for establishing cut-off scores allows for a `false positive rate (Garner and Garfinkel, 1979). Thus, a certain number of normal subjects with eating concerns similar to clinical patients are identified. Such a group are potentially at risk, and it is, thus, important that they are not excluded from examination. The bulimic subgroup of anorexics in the Garner et al. (1983) study scored higher than the restrictive subgroup in the categories of 'Bulimia' and 'Body Dissatisfaction'. These higher scores were used to establish cut-off points in these categories.

3.3 STATISTICS

Each subject's responses to relevant questions on the Dietary History Questionnaire were entered onto a spreadsheet. Age, height (H), present weight (Wt) were entered and the Body Mass Index (BMI = Wt/H^2) computed for each subject. Also recorded were discrete answers to questions including: present or past history of an eating disorder, history of vomiting and/or laxative abuse, satisfaction with present weight, and whether the subject is currently on a weight-reducing diet. Total scores for the EAT, ORQ and the scores for the EDI subscales were also entered onto the spreadsheet. All information on the spreadsheet was transported onto a computerised statistical package for analysis.

Mean values and standard deviations were calculated for the results of the questionnaires as well as the demographic and dietary health information of each subject. The data were analysed by means of a 2-way analysis of variance (2-way ANOVA) (Howell, 1989; Goodman, 1988) for males and females together in each of the three groups in order to determine whether there were any significant differences between the three groups in terms of their questionnaire scores and specific demographic and dietary history information. Where the overall F value for a 2-way ANOVA was found to be significant, the Tukey HSD was carried out for the purpose of making post hoc comparisons to identify between which specific groups the significant statistical differences lay. In order to seek statistically significant differences within groups and between genders, thus preventing the influence between gender and groups, 1-way ANOVAs were computed. Where data was assigned to ordinal categories, the Chi-squared test was performed to seek any significant associations between variables.

CHAPTER 4

RESULTS

Results are initially presented in descriptive detail to establish the characteristics of subjects across the three groups. These three groups are then statistically analysed to ascertain whether their are any specific group characteristics in terms of their eating attitudes and behaviour, as well as exercise behaviour. To maximize statistical power, genders are grouped together, as the MHAs (n = 16), who were a difficult group to recruit, had a relatively small sample size. Such an analysis is done for the purpose of testing the primary hypothesis that both the High-impact Aerobics (HAs) and the Road Runner (RRs) groups will reflect greater degrees of disordered eating and exercise than the control group (COs), with the former experimental group placing an emphasis on controlled dietary behaviour and the latter experimental group placing an emphasis on exercise. Thereafter, a gender specific comparison will be conducted to test the second hypothesis, namely, that males, as a group, are more pressured towards fitness while females face a pressures towards thinness.

4.1 DEMOGRAPHIC INFORMATION FOR THE THREE GROUPS

The demographic data obtained is summarised in Table 1. The means and standard deviations of the three groups scores on the EAT and ORQ, as well as the EDI total score and relevant subscales (DT, BU, BD) appear in Table 2. Also listed are the percentages and number of subjects in each group who scored above the cut-off values reported in the literature (see Chapter 3).

TABLE 1

DESCRIPTIVE CHARACTERISTICS OF THE THREE GROUPS

	FHA (n = 43)	MHA (n = 16)	FRR (n = 47)	MRR (n = 38)	FCO (n = 31)	MCO (n = 30)

VARIABLE	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
AGE (YRS)	33.6	12.4	35.1	14.8	33.2	7.4	38.5	11.1	30.4	7.6	33.0	9.3
BMI[1] (kg/m^2)	22.2	2.9	24.3	1.5	20.9	2.2	23.3	2.7	21.3	2.2	24.2	1.9

VARIABLE	%		%		%		%		%		%	
HIST of ED[2]	9.3	n = 4	0.0	n = 0	6.4	n = 3	0.0	n = 0	0.0	n = 0	0.0	n = 0
DIETING[3]	30.2	n = 13	6.3	n = 1	8.5	n = 4	2.6	n = 1	22.6	n = 7	10.0	n = 3
SAT. PRES. WT[4]	32.6	n = 14	50.0	n = 8	46.8	n = 22	60.5	n = 23	48.4	n = 15	56.7	n = 17
VOMITING[5]	16.3	n = 7	6.3	n = 1	12.8	n = 6	0.0	n = 0	6.5	n = 2	0.0	n = 0
LAXATIVE[6]	9.3	n = 4	0.0	n = 0	6.4	n = 3	0.0	n = 0	9.7	n = 3	3.3	n = 1

NOTES:
1. Body Mass Index
2. Present/Previous history of an Eating Disorder
3. Presently on a weight-reducing diet
4. Satisfied with present weight
5. History of Vomiting
6. History of Laxative Abuse

TABLE 2

Means and standard deviations for the questionnaire results for the three groups and the percentage of subjects above the cut-off points

	MEAN (SD)			% above cut-off (number)			
	HA (n = 59)	RR (n = 85)	CO (n = 61)	CUT-OFF	HA (n = 59)	RR (n = 85)	CO (n = 61)
EAT	15.4 (12.2)	13.7 (9.4)	10.9 (7.7)	30.0	11.9% (n = 7)	8.2% (n = 7)	6.6% (n = 4)
EDITOT	32.8 (23.1)	24.4 (15.2)	24.6 (14.8)				
DT	4.4 (5.4)	2.2 (3.2)	2.6 (4.3)	10.0	18.6% (n = 11)	5.9% (n = 5)	11.5% (n = 7)
BU	1.5 (2.9)	0.7 (1.6)	0.6 (1.6)	4.0	10.2% (n = 6)	5.9% (n = 5)	6.6% (n = 4)
BD	10.7 (7.0)	6.1 (6.2)	7.0 (7.7)	7.0	72.9% (n = 43)	35.3% (n = 30)	34.4% (n = 21)
ORQ	9.9 (3.8)	13.8 (3.1)	6.4 (3.5)	15.0	13.6% (n = 8)	42.4% (n = 36)	1.6% (n = 1)

NOTES: EAT = Eating Attitude Test
EDITOT = Eating Disorder Inventory Total Score
DT = Drive for Thinness (EDI Subscale)
BU = Bulimia (EDI Subscale)
BD = Body Dissatisfaction (EDI Subscale)
ORQ = Obligatory Running Questionnaire

4.2 COMPARISONS BETWEEN GROUPS

The 2-way ANOVA performed on specific demographic information clarified that no statistically significant difference existed between the groups with regards to age and BMI. It is, however, worth noting that the RRs recorded the lowest mean BMI.

Seven subjects reported having either presently or previously suffered from an eating disorder. Four HAs reported a pattern of 'over-eating' or 'binge-like' behaviour, while the remaining three cases, all RRs, were either diagnosed with AN or bulimia nervosa. The differences between the three groups were not statistically significant.

Figure 1 visually shows that the HAs had the highest mean scores on the EAT, with 11.9% of the subjects in this group scoring ≥ 30, that maximally differentiates anorexics from normal weight controls (Garner & Garfinkel, 1979). The 1-way ANOVA revealed that their mean scores on the EAT was significantly higher ($F = 3.28; df = 2,202; p < 0.0396$) than the COs. Similarly, the 1-way ANOVA revealed that the HAs scored significantly higher ($F = 4.63; df = 2,202; p < 0.0108$) than both the COs and the RRs on the EDI total scores. On all three EDI subscales that are particularly relevant to this study (Bulimia, Drive for Thinness, and Body Dissatisfaction), the HAs, again, scored significantly higher than either one or both of the other groups. These findings are visually displayed in Figure 2. Results on the 1-way ANOVA indicated that the HAs scored significantly higher($F = 3.80; df = 2,202; p < 0.0240$) than the other groups on the Bulimia subscale. Similarly, the HAs scored significantly higher ($F = 3.44; df = 2,199; p < 0.0339$) on the 2-way ANOVA than the other groups on the Drive for Thinness subscale of the EDI, with the RRs recording the lowest mean scores. A pattern similar to the results on the Drive for Thinness subscale of the EDI were reflected on the Body Dissatisfaction subscale of the EDI, with the HAs being

FIGURE 1

Comparison of EAT Mean Scores for the three groups

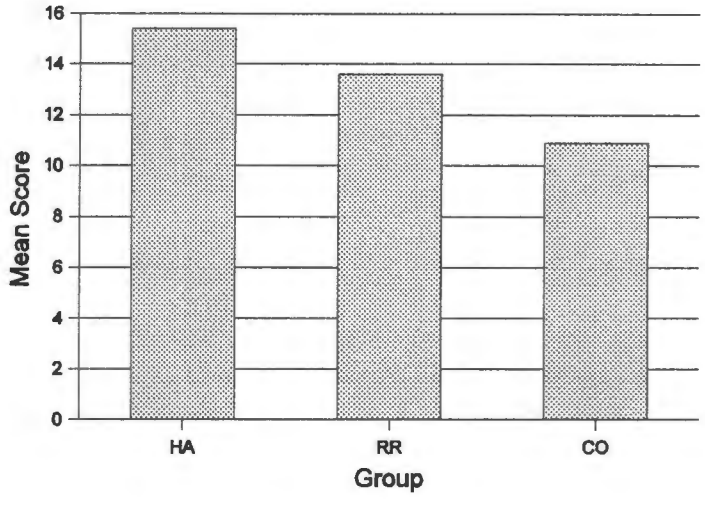
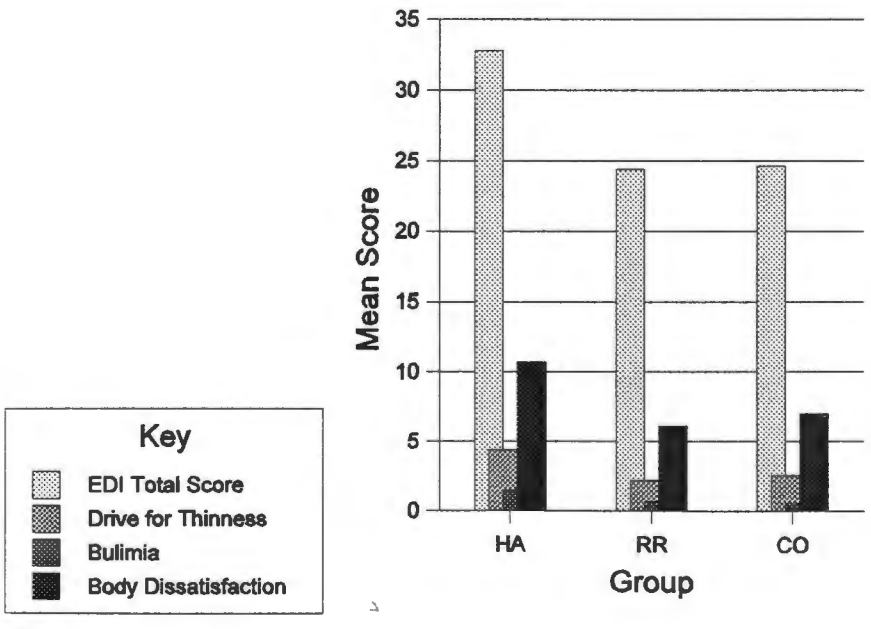


FIGURE 2

Comparison of EDI Mean Scores for the three groups



significantly more ($F = 5.51$; $df = 2,199$; $p < 0.0047$) dissatisfied with their bodies than the other groups, COs being marginally more dissatisfied than the RRs.

Closely related to trends on the eating disorder inventories results was the significant association ($X^2 = 9.5$; $df = 2$; $p < 0.009$) between the three groups with regard to present engagement in a weight-reducing diet. The HAs, at 23.7%, dieted significantly more than the RRs (16.4%), who, in turn, dieted more than the COs (5.9%). Although not statistically significant, these results are consistent with the findings that the HAs were the least satisfied with their present weight, while RRs, who recorded the lowest mean BMI ($X = 21.99$, $SD = 2.69$), were the group most satisfied with their present weight.

As expected, results of the ORQ on a 2-way ANOVA indicated that the RRs scored significantly higher ($F = 82.78$; $df = 2,199$; $p < 0.0001$) than the HAs, who, in turn, scored significantly higher than the COs. This trend is visually displayed in Figure 3. A substantial proportion (42.4%) of the RRs scored ≥ 15 which was the score adopted in Krejci et al's (1992) study to indicate obligatory exercising.

Table 3 outlines the comparison between groups on two levels. First, it makes the comparison with genders combined, as described in the results above, and second, it outlines the comparison between groups for each gender separately. On comparing the combined genders results with those of each gender alone, it is evident that the trends are very similar, with a few exceptions. On the eating disorder inventories, the results for females were all elevated when compared to those of males. The one exception was the results on the EAT, where the MHAs ($X = 14.1$, $SD = 8.04$) were comparable with those of FHAs ($X = 15.9$, $SD = 13.44$). On the Body Dissatisfaction subscale of the EDI, the FCOs mean score ($X = 11.0$, $SD = 8.78$) was significantly higher than that of MCOs ($X = 2.9$, $SD = 3.17$).

TABLE 3

Tukey HSD Post Hoc results on questionnaires for the three groups Irrespective of Gender, Among Females and Among Males

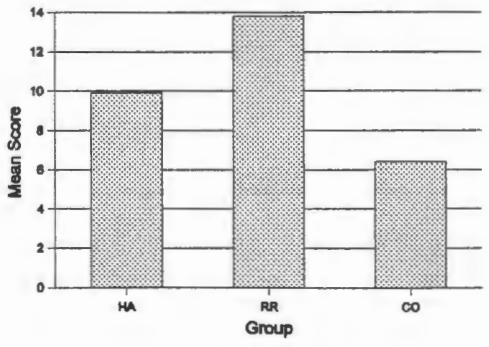
	MEAN Irrespective of Gender				MEAN for Females				MEAN for Males			
	HA	RR	CO	TUKEY HSD ($p < 0.05$)	HA	RR	CO	TUKEY HSD ($p < 0.05$)	HA	RR	CO	TUKEY HSD ($p < 0.05$)
EAT*	15.4	13.7	10.9	HA > CO	15.8	15.9	12.0		14.1	10.9	9.6	HA > CO
EDITOT*	32.8	24.4	24.6	HA > RR HA > CO	36.9	27.3	29.6		21.7	20.8	19.5	
DT**	4.4	2.2	2.6	HA > RR HA > CO	5.2	3.2	3.5		2.3	0.9	1.6	
BU*	1.5	0.7	0.6	HA > CO HA > RR	1.8	1.0	1.1		0.4	0.4	0.1	
BD**	10.7	6.1	7.0	HA > RR HA > CO	12.3	8.5	11.0	HA > RR	6.3	3.1	2.9	HA > RR HA > CO
ORQ***	9.9	13.8	6.4	RR > HA HA > CO	9.8	14.3	6.0	RR > HA HA > CO	10.3	13.2	6.8	RR > HA HA > CO

NOTES: EAT = Eating Attitude Test
EDITOT = Eating Disorder Inventory Total Score
DT = Drive for Thinness (EDI Subscale)
BU = Bulimia (EDI Subscale)
BD = Body Dissatisfaction (EDI Subscale)
ORQ = Obligatory Running Questionnaire

* = $p < 0.05$
** = $p < 0.01$
*** = $p < 0.001$

FIGURE 3

Comparison of ORQ Mean Scores for the three groups



It was interesting to note that the trends and mean scores for males and females on the ORQ were similar, with the FRRs ($X = 14.32$, $SD = 2.92$) mean scores higher than those of the MRRs ($X = 13.2$, $SD = 3.31$).

4.3 GENDER COMPARISON

The means and standard deviations of each genders' scores on the EAT and ORQ, as well as the EDI total score and relevant subscales (DT, BU, BD) appear in Table 4. Also listed are the percentages and number of subjects in each gender who scored above the cut-off values reported in the literature (see Chapter 3).

The 2-way ANOVA reflected a statistically significant difference ($F = 4.96; df = 1,199; p < 0.0271$) between males ($X = 35.9, SD = 11.17$) and females ($X = 32.6, SD = 9.19$) with regards to age. The same test also indicated a significantly higher ($\underline{F} = 46.89; \underline{df} = 1,199; p < 0.0001$) BMI for males ($X = 23.8, SD = 2.27$) compared to females ($X = 21.44, SD = 2.49$).

All seven subjects who reported having either presently or previously suffered from an eating disorder were females, thus indicating a significant association ($\underline{X}^2 = 5.03; \underline{df} = 1; p < 0.025$) between genders with regard to the development of a diagnostic eating disorder . Four FHAs reported a present, long-standing pattern (4-27 years) of undiagnosed 'over-eating' or 'binge-like' behaviour. Their BMIs fell within the normal range ($20.0 < BMI < 25.0$). The remaining three cases were all FRRs and formally diagnosed with eating disorders. The first has been bulimic for the past 14 years ($BMI = 21.26$), while the other two have been diagnosed as anorexic (bulimic subgroup). One, who has a BMI of 16.07, has secondary amenorrhoea.

The 2-way ANOVA indicated that the females ($X = 14.91, SD = 11.88$) had significantly

TABLE 4

Means and Standard Deviations for the questionnaire results across genders, and the percentage of subjects above the cut-off points

	MEAN (SD)		Percentage above cut-off (number)		
	Female (n = 121)	**Male (n = 84)**	**Cut-off**	**Female (n = 121)**	**Male (n = 84)**
EAT	14.9 (11.9)	11.0 (5.5)	30.0	12.4% (n = 15)	3.6% (n = 3)
EDITOT	31.3 (20.5)	20.5 (11.1)			
DT	4.0 (4.9)	1.4 (2.9)	10.0	16.5% (n = 20)	3.6% (n = 3)
BU	1.3 (2.3)	0.3 (0.9)	4.0	10.7% (n = 13)	2.4% (n = 2)
BD	10.5 (7.6)	3.7 (3.8)	7.0	63.6% (n = 77)	20.2% (n = 17)
ORQ	10.6 (4.8)	10.4 (4.7)	15.0	23.1% (n = 28)	20.2% (n = 17)

NOTES: EAT = Eating Attitude Test
EDITOT = Eating Disorder Inventory Total Score
DT = Drive for Thinness (EDI Subscale)
BU = Bulimia (EDI Subscale)
BD = Body Dissatisfaction (EDI Subscale)
ORQ = Obligatory Running Questionnaire

higher ($F = 7.80; df = 1,199; p < 0.0057$) mean scores on the EAT than the males ($X = 11.05, SD = 5.48$), which is visually evident in Figure 4. The same test indicated that the females scored significantly higher ($F = 19.80; df = 1,199; p < 0.0001$) than the males on the EDI total score. In addition, the 2-way ANOVA also indicated that the females scored significantly higher ($F = 14.75; df = 1,199; p < 0.0002$) than the males on the Bulimia subscale of the EDI. Similarly, the females scored significantly higher ($F = 18.53; df = 1,199; p < 0.0001$) than the males on the Drive for Thinness subscale of the EDI. Consistent with these results was the females significantly higher ($F = 61.06; df = 1,199; p < 0.0001$) mean scores on the Body Dissatisfaction subscale of the EDI. These results are visually displayed in Figure 5. Chi-squared tests related consistent results, with the females (19.83%) dieting more ($X^2 = 7.87; df = 1; p < 0.005$) than the males (5.95%). It was also indicated that females vomit ($X^2 = 8.65; df = 1; p < 0.003$) and abuse laxatives ($X^2 = 4.89; df = 1; p < 0.027$) more than males do. They were also less satisfied ($X^2 = 4.46; df = 1; p < 0.035$) with their present weight than males were.

Neither the 1-way ANOVA nor the 2-way ANOVA revealed any significant differences across gender on the ORQ, with the female mean scores ($X = 10.59, SD = 4.80$) being marginally higher than the male ($X = 10.38, SD = 4.42$) mean scores. The histogram in Figure 6 visually highlights this finding.

FIGURE 4

Comparison of EAT Mean Scores by Gender

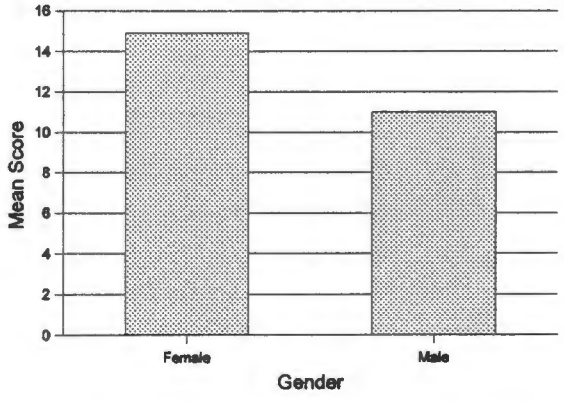


FIGURE 5

Comparison of EDI Mean Scores by Gender

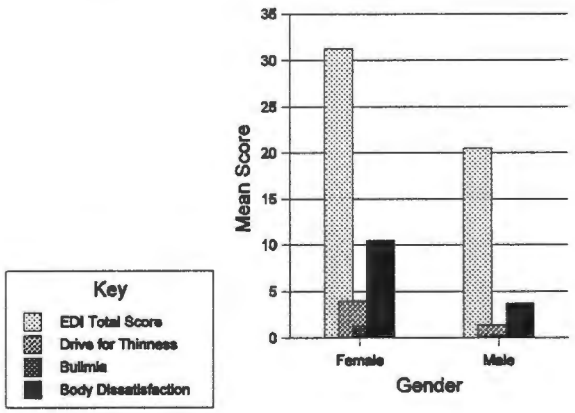
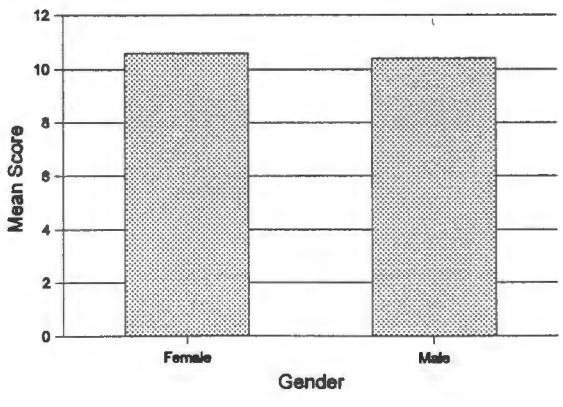


FIGURE 6

Comparison of ORQ Mean Scores by Gender



CHAPTER 5

DISCUSSION

In an effort to better understand the relationship between EXE and eating disorders, this study investigates the impact of the pressures for thinness and the pressures for fitness towards the development of pathological eating and pathological exercise. It is hypothesised that when the pressure to be fit overrides the pressure to be thin, this will lead to disturbed attitudes and behaviours towards exercise. When the pressure to be thin overrides the pressure to be fit, subjects will be more susceptible to the development of eating problems. The second hypothesis will determine whether the prevalence of eating disorders is higher among the female sample, while males are more representative of those who exercise excessively.

Three independent groups, each including members from both genders, were studied. Two of these groups regularly practised a physical activity that exposed them to one or a combination of the two pressures discussed above, while the third group constituted a control.

In terms of the questionnaire results, this discussion will initially focus on differences between the three groups. In light of the fact that similar trends were recorded for males and females in each group, the discussion of each group will be done irrespective of gender. Thereafter, a gender comparisons will be made in those areas of significance to the study, before conclusions are drawn.

5.1 COMPARISON OF RESULTS WITH PREVIOUS STUDIES

Where available, results of the present study are compared with previous findings

obtained in similar studies.

HIGH-IMPACT AEROBICS GROUP (HAs)

Individuals who regularly practice high-impact aerobics were considered as representative of a group that are in pursuit of thinness, although a desire for fitness cannot be overlooked. Therefore, these individuals might be considered to be vulnerable to the development of eating disorders. Unfortunately, their has been limited, if any, research done among this group of athletes in the field of eating disorders and, thus, results cannot be compared with those of any previous studies. Despite this group being expected to pursue fitness to some extent, results reflected this group to be considerably more concerned than the other two groups about eating, weight and body image, as measured on the DHQ, EAT and EDI subscales of relevance to the study. The HAs scores significantly lower than the RRs, yet significantly more than the COs on the ORQ, thus, reflecting fewer exercise dependency concerns than the RRs.

ROAD RUNNERS GROUP

The group of RRs in the present study was considered to be representative of individuals who would be primarily interested in the pursuit of fitness, thus making them less vulnerable to the development of eating disorders, but more susceptible to exercising excessively. However, because a lean body with low percentage body fat is desirable for many runners, as has been noted by Davis (1992), weight and dietary concerns cannot altogether be excluded. Limited, if any, studies utilizing eating disorder inventories have been performed on male runners of varying ability who are not necessarily classified as obligatory runners. For this reason, results of RRs in the present study can only be made with female runners in other studies.

The mean EAT scores for RRs was comparable with that of runners in previous studies

(Weight & Noakes, 1987; Nudelman et al., 1988) The EAT scores of RRs who scored above the cut-off point on the ORQ, were also comparable with EAT scores for obligatory runners in the study by Yates et al. (1992).

The EDI total score for females was almost identical to that of female cross-country runners in Weight and Noakes' (1987) study. The relevant EDI subscales scores for FRRs were comparable with female cross-country runners in the same study (Weight & Noakes, 1987).

CONTROL GROUP

The mean EAT scores for this group was similar to findings in other studies of non-clinical groups (Garner & Garfinkel, 1979; Garner et al., 1982; Nudelman et al., 1988). Of the three groups, they scored the lowest.

In addition, the COs results on the EDI subscales most relevant to the present study were comparable to the respective EDI subscale means obtained for controls in the study by Garner et al. (1983). An inspection of the eight EDI subscale mean scores reveals that the COs scored below all the cut-off points, except Body Dissatisfaction, Perfectionism, and Interoceptive Awareness. The Body Dissatisfaction subscale, which was designed to detect dissatisfaction with "pubertal fatness" (Garner et al., 1983), is, according to Norring and Sohlberg (1988), a measure of frustration with weight and body shape at a general level not necessarily related to an eating disorder. The COs mean score on this subscale was somewhat higher than the score obtained by Garner et al.s' (1983) male and female comparison groups combined mean scores. More than half the COs had scores above the cut-off point on the Perfectionism subscale, which is indicative of excessive personal expectations for superior achievement.

The COs mean score on the Obligatory Running Questionnaire (Blumenthal et al., 1984) was comparative to the mean score for controls in the study by Krejci et al.(1992).

5.2 COMPARISON OF THE THREE GROUPS

In terms of weight and eating concerns, it was found that the HAs displayed significantly higher eating, weight and body shape concerns than both the RRs and COs. The HAs obtained the highest mean scores on the EAT, with almost twelve percent of subjects scoring above the cut-off point. While being higher than that of the RRs, this did not reach statistical significance. Although the study by Krejci et al. (1992) reflected significantly higher EAT scores for their exercise group over the controls, the present study did not reflect significantly higher EAT scores for the RRs when compared to the COs.

As with the EAT results, a similar trend was observed on the EDI total score, with the HAs scoring significantly higher than both the RRs and COs. As was reflected in other studies (Garner, Olmstead, & Polivy, 1983; Garner & Olmstead, 1984), differences in the mean total scores of the EDI between RRs and COs was negligible. These results suggest that RRs are not preoccupied with eating, weight and body shape concerns.

Results of the first three subscales of the EDI in the present study are comparable to those in the study by Garner et al. (1983). In terms of bulimic behaviour, the HAs scored significantly higher than the RRs and the COs. Such a significance is confirmed in the observation that HAs tend to vomit and abuse laxatives more than the other groups. The HAs also revealed themselves to be significantly more preoccupied with a drive for thinness than the RRs and COs. Similarly, the HAs were significantly more dissatisfied with their bodies than were the COs and the RRs. Although the Chi-squared test did not reflect a statistically significant association between groups, it is of interest

to note that just over half of RRs and COs were satisfied with their present weight, while only a third of HAs were satisfied with their present weight. Reflecting this, and further illustrating this trend was the statistically significant association between groups with regard to present engagement in a weight-reducing diet. Almost a quarter of the HAs were currently on a weight-reducing diet, while fewer COs dieted and only negligible number of runners were presently dieting. All these results suggest that HAs are preoccupied by eating, weight and body shape concerns, while runners are not.

As far as exercise dependency is concerned, the RRs displayed significantly higher concerns with exercise behaviour and attitudes than the HAs, who, in turn, showed greater exercise concerns than the COs. This is in keeping with results in the literature (Hauck & Blumenthal, 1992; Blumenthal et al., 1984), where the control groups scored significantly lower on the ORQ than experimental groups, suggesting minimal levels of obligatory exercising among the normal population. Almost half the RRs scored above the cut-off point on the ORQ, while a substantially lower proportion of HAs and COs reached the cut-off point. This suggests a high risk towards EXE among RRs. Although the RRs scored significantly higher than the HAs on this questionnaire, the two questions that applied exclusively to runners may have confounded the results. Many exercise questionnaires are available (Pasman & Thompson, 1988; Ogden, Veale.and Summers, 1993), however, few are standardised and each present with some difficulties (Hauck & Blumenthal, 1992).

5.3 GENDER COMPARISON

The main finding here was, as expected, that females presented with significantly higher eating, weight and body shape concerns than males. In terms of exercise dependency, however, there were negligible differences between genders.

The female subjects obtained significantly higher mean scores on the eating disorder inventories than did the males, suggesting a greater prevalence of eating and weight concerns among females. Similar to the trend in the study by Yates et al. (1992), females in the present study scored significantly higher than the males on the EAT. Fifteen females, mostly from the two experimental groups, as opposed to three males, scored above the cut-off on this test, suggesting a substantially greater prevalence of possible cases of eating disordered subjects among females. This was confirmed by the finding that all of the subjects (FHAs = 4; FRRs = 3) who presently or in the past suffered from an eating disorder were female.

Among previous studies that have offered gender comparisons for the EDI (Pasman & Thompson, 1988; Garner et al., 1983), females have consistently scores higher than the males, with the exception of the Perfectionism subscale. The same trend was observed in the present study. The EDI total score, as well as the three EDI subscale mean scores most relevant to the present study were all significantly higher for females than for the males. In every instance, the FHAs had the highest mean scores, followed by the FCOs, with the FRRs scoring lowest. Such differences were not significant, with one exception, where FHAs scores significantly higher than the FRRs on the Body Dissatisfaction subscale of the EDI. The females' higher scores on Drive for Thinness, Bulimia and Body Dissatisfaction support the contention that females are more preoccupied with weight and body shape than are males. Furthermore, results on the Chi-squared tests revealed that almost 60 percent of females as opposed to slightly more than 40 percent of males are dissatisfied with their present weight. This possibly accounts for the significantly higher proportion of females presently engaging in weight-reducing diets.

There was a negligible difference in the mean scores between males and females on the

ORQ. Almost a quarter of the females scored above the cut-off point on the ORQ, while slightly fewer males scored above the cut-off point. In addition, almost half of the FRRs scored above the cut-off point, with far fewer MRRs doing so. These results contrast with the slightly higher mean scores for males above females in Blumenthal et al's (1984) study of obligatory runners, and do not conform with the commonly believed notion that males are positively more sanctioned than females to engage in exercise.

5.4 CONCLUSION

This study examined the impact of physical activities towards the susceptibility of disordered eating and excessive exercise. Since the earliest descriptions of AN by Gull (1873) and Lasegue (1873), EXE was a noted characteristic of AN. Over a century later, Yates and her colleagues (1983) controversially claimed that 'obligatory running' among males was analogous to AN among females. Despite acknowledging some similarities between the two groups, numerous researchers have since focused on the prevalence of eating disorders among athletes as a function of the nature of the physical activity (Borgen & Corbin, 1987; Loosli & Benson, 1990; Pasman & Thompson, 1988; Weight & Noakes, 1987). It was hypothesised that when the pressure to be fit overrides the pressure to be thin, this will lead to disturbed attitudes and behaviours towards exercise. When the pressure to be thin overrides the pressure to be fit, subjects will be more susceptible to the development of eating problems.

There was evidence that the HAs displayed greater eating, weight and body shape concerns. While it was illustrated that the RRs were not primarily preoccupied with weight and body image concerns, scores on the ORQ reflected greater levels of exercise dependency among RRs. A gender comparison confirmed the greater vulnerability females, as opposed to males, have towards the development of eating and weight concerns. All seven of the subjects that disclosed having a present or past history of

an eating disorder were female. Results of the EAT and the EDI indicated greater concern among females towards weight control and body image. Despite it being anticipated that males would score higher on the ORQ, results revealed that females were no less susceptible to exercising excessively than males were. The vast majority of these subjects were RRs.

A tentative conclusion can be drawn from the present study. The findings that reflected that HAs emphasised eating, weight and body concerns, while RRs were more concerned with their exercise behaviour, seem to fit one of the models postulated by Eisler and le Grange (1990), i.e., EXE is a variant of AN (see chapter 2). This model invokes a specific aetiological process underlying both AN and EXE, where a physical activity that emphasises fitness (road running), leads to a greater susceptibility towards EXE. In contrast, a physical activity that emphasises fitness in combination with an even greater emphasis towards thinness (high-impact aerobics) makes such individuals vulnerable to the development of eating disorders. The finding that females have greater eating, weight and body shape concerns than males also runs parallel with Eisler and le Grange's (1990) model, in that social pressure to be thin, which is clearly stronger in females, does have a powerful impact on their attitudes to eating, weight and body shape. The negligible variation across genders towards the practise of excessive exercise, however, contradicts Yates et al's (1983) claim that obligatory running among males is analogous to AN among females. Instead, as Yates and her colleagues (1994) have subsequently recognised, the analogy fits better into a risk-factor model, in that their are common situational, sociocultural, psychological, and biological factors that could predispose individuals, irrespective of gender, to develop either conditions, depending on life circumstances. This would explain the finding in the present study that the susceptibility to exercise excessively, at least among RRs, is not a function of gender.

An interesting future study would be to test another model, as suggested by Eisler and le Grange (1990), that AN and EXE are overlapping groups, where EXE can lead to the development of AN. Subjects from the present study who reached the cut-off point on the ORQ could be followed up to determine whether their eating attitudes and behaviour has drawn them any closer to the development of an eating disorder. Likewise, following up those individuals with high EAT scores could be done to confirm any subjects with eating disorders.

One limitation to this study is the uncertainty whether individuals who participate in high-impact aerobics develop eating difficulties as a result of their participation in aerobics, or whether such activity attracts individuals who already have eating difficulties. Another limitation to the present study involves the defining of groups. The HAs were asked to participate in the study only if they did high-impact aerobics on a 'regular' basis, and although all the RRs were registered runners, they were not asked to record how often they ran. Lastly, as mentioned by Eisler and Szmukler (1985), a cautionary note needs to be sounded about the over-reliance on the use of questionnaires as the sole source of information, as was the case in this study. More specifically, many exercise questionnaires are available (Pasman & Thompson, 1988; Ogden et al, 1993), of which the ORQ is one, but few are standardised and each present with some difficulties (Hauck & Blumenthal, 1992).

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APPENDIX

INSTRUMENTS

DIETARY HISTORY QUESTIONNAIRE

Please complete this form as honestly and as accurately as possible.
All information provided will remain strictly confidential.

Date.....

Name.....

Age.....

Present Address.....

..... Tel No.....

Have you always lived in Cape Town? .....
If not, where did you live? .....
Are you living in a residence?.....

1. Are either of your parents overweight?.....
   Who?.....
   Have they always been overweight?.....

2. Are you a vegetarian?.....
   Do you eat eggs and cheese?.....
   How may eggs per week?.....
   How much cheese per week?.....

3. Do you have an history of an eating disorder?.....
   If yes, was it diagnosed or not?.....
   Nature of disorder.....
   Duration of disorder.....
   At what age did disorder begin?.....

4. Do you menstruate?.....
   When was your last period?.....
   How often do you menstruate?.....
   When did you first start menstruating?.....

5. Height:.....

6. Weight:.....

7. Do you ever feel faint, dizzy, lack energy?.....
   State which and how often.....

8. Do you ever take diuretics ('water pills')?.....
   How often?..... How many?.....
   Do you ever vomit?..... How often?.....
   Do you ever take laxatives?.....
   How often?..... How many?.....

9. Do you take supplements or vitamins?.....
   If so, name them and quantity/amount taken per day.....
   .....

10. Do you consume alcohol?.....
    If so, what type.....
    How much on weekdays:.....
    weekends:.....

11. Highest Previous Adult Weight.....
    Age at that time.....

12. Lowest Previous Adult Weight.....
    Age at that time.....

13. Are you satisfied with your present weight (yes/no)?.....

14. If no, what weight would you like to be?.....

15. Were you ever overweight as a child or adolescent?.....

16. If yes, did you diet at that time?.....
    Please give brief details.....
    .....
    .....

17. Are you currently on a weight-reducing diet?.....
    If yes, please describe the diet briefly.....
    .....
    .....
    .....

IE: ..... Date: .....

Eating Attitudes Test.

Please place an (X) under the column which applies best to each of the numbered statements. All of the results will be strictly confidential. Most of the questions directly relate to food or eating, although other types of questions have been included. Please answer each question carefully. Thank you.

ALWAYS	VERY OFTEN	OFTEN	SOMETIMES	RARELY	NEVER	
( )	( )	( )	( )	( )	( )	1. Like eating with other people.
( )	( )	( )	( )	( )	( )	2. Prepare foods for others but do not eat what I cook.
( )	( )	( )	( )	( )	( )	3. Become anxious prior to eating.
( )	( )	( )	( )	( )	( )	4. Am terrified about being overweight.
( )	( )	( )	( )	( )	( )	5. Avoid eating when I am hungry.
( )	( )	( )	( )	( )	( )	6. Find myself preoccupied with food.
( )	( )	( )	( )	( )	( )	7. Have gone on eating binges where I feel that I may not be able to stop.
( )	( )	( )	( )	( )	( )	8. Cut my food into small pieces.
( )	( )	( )	( )	( )	( )	9. Aware of the calorie content of foods that I eat.
( )	( )	( )	( )	( )	( )	10. Particularly avoid foods with a high carbohydrate content (e.g. bread, potatoes, rice, etc.)
( )	( )	( )	( )	( )	( )	11. Feel bloated after meals.
( )	( )	( )	( )	( )	( )	12. Feel that others would prefer if I ate more.
( )	( )	( )	( )	( )	( )	13. Vomit after I have eaten.
( )	( )	( )	( )	( )	( )	14. Feel extremely guilty after eating.
( )	( )	( )	( )	( )	( )	15. Am preoccupied with a desire to be thinner.
( )	( )	( )	( )	( )	( )	16. Exercise strenuously to burn off calories.
( )	( )	( )	( )	( )	( )	17. Weigh myself several times a day.
( )	( )	( )	( )	( )	( )	18. Like my clothes to fit tightly.
( )	( )	( )	( )	( )	( )	19. Enjoy eating meat.
( )	( )	( )	( )	( )	( )	20. Wake up early in the morning.
( )	( )	( )	( )	( )	( )	21. Eat the same foods day after day.
( )	( )	( )	( )	( )	( )	22. Think about burning up calories when I exercise.
( )	( )	( )	( )	( )	( )	23. Have regular menstrual periods.
( )	( )	( )	( )	( )	( )	24. Other people think that I am too thin.
( )	( )	( )	( )	( )	( )	25. Am preoccupied with the thought of having fat on my body.
( )	( )	( )	( )	( )	( )	26. Take longer than others to eat my meals.
( )	( )	( )	( )	( )	( )	27. Enjoy eating at restaurants.
( )	( )	( )	( )	( )	( )	28. Take laxatives.
( )	( )	( )	( )	( )	( )	29. Avoid foods with sugar in them.
( )	( )	( )	( )	( )	( )	30. Eat diet foods.
( )	( )	( )	( )	( )	( )	31. Feel that food controls my life.
( )	( )	( )	( )	( )	( )	32. Display self control around food.
( )	( )	( )	( )	( )	( )	33. Feel that others pressure me to eat.
( )	( )	( )	( )	( )	( )	34. Give too much time and thought to food.
( )	( )	( )	( )	( )	( )	35. Suffer from constipation.
( )	( )	( )	( )	( )	( )	36. Feel uncomfortable after eating sweets.
( )	( )	( )	( )	( )	( )	37. Engage in dieting behaviour.
( )	( )	( )	( )	( )	( )	38. Like my stomach to be empty.
( )	( )	( )	( )	( )	( )	39. Enjoy trying new rich foods.
( )	( )	( )	( )	( )	( )	40. Have the impulse to vomit after meals.

Directions: Listed below are a series of statements concerning personal habits. Please indicate whether each statement is true or generally true (T) or false or generally false (F) for you.

1. I engage in physical exercise on a regular basis. T F
2. My main form of exercise is walking, jogging, or running T F
3. I seldom exercise more than three days per week. T F
4. When I don't exercise I feel guilty. T F
5. I sometimes feel like I don't want to exercise but I go ahead and push myself anyway. T F
6. My best friend likes to exercise. T F
7. When I miss an exercise session, I feel concerned about my body possibly getting out of shape. T F
8. I have not engaged in any regular exercise until the past year (or not at all) T F
9. If I have planned to exercise at a particular time and something unexpected comes up (like an old friend comes to visit or I have some work that needs immediate attention) I will usually skip my exercise for that day. T F
10. If I miss a planned workout, I attempt to make up for it the next day. T F
11. In the past week I have missed one day of planned exercise for no good reason. T F
12. Sometimes I feel a need to exercise twice in one day, even though I may feel a little tired. T F
13. If I feel I have overeaten, I will try to make up for it by increasing the amount I exercise. T F
14. When I miss a scheduled exercise session I may feel tense, irritable, or depressed. T F
15. I will not exercise outdoors if the weather is cold and rainy. T F
16. Sometimes I find that my mind wanders to thoughts about exercising. T F
17. I have had daydreams about exercising. T F
18. I have competed in at least one road race in the past 6 months. T F
19. I keep a record of my exercise performance such as how long, how far, or how fast I run. T F
20. I have experienced a feeling of euphoria or a "runner's high" during or after an exercise session. T F
21. I will not exercise if I feel sick or injured. T F

PRIVATE AND CONFIDENTIAL

Name.....Date.....

Age.....Sex.....

Present Weight.....Height.....

Instructions

This is a scale which measures a variety of attitudes, feelings and behaviours. Some of the items relate to food and eating. Others ask you about your feelings about yourself. THERE ARE NO RIGHT OR WRONG ANSWERS SO TRY VERY HARD TO BE COMPLETELY HONEST IN YOUR ANSWERS. RESULTS ARE COMPLETELY CONFIDENTIAL. Read each question and place an (X) under the column which applies best for you. Please answer each question very carefully. Thank you.

		ALWAYS	USUALLY	OFTEN	SOMETIMES	RARELY	NEVER
1.	I eat sweets and carbohydrates without feeling nervous.	( )	( )	( )	( )	( )	( )
2.	I think that my stomach is too big.	( )	( )	( )	( )	( )	( )
3.	I wish I could return to the security of childhood.	( )	( )	( )	( )	( )	( )
4.	I eat when I am upset	( )	( )	( )	( )	( )	( )
5.	I stuff myself with food	( )	( )	( )	( )	( )	( )
6.	I wish I could be younger	( )	( )	( )	( )	( )	( )
7.	I think about dieting	( )	( )	( )	( )	( )	( )
8.	I get frightened when my feelings are strong.	( )	( )	( )	( )	( )	( )
9.	I think my thighs are too large	( )	( )	( )	( )	( )	( )
10.	I feel ineffective as a person	( )	( )	( )	( )	( )	( )
11.	I feel extremely guilty after over-eating.	( )	( )	( )	( )	( )	( )
12.	I think my stomach is just the right size.	( )	( )	( )	( )	( )	( )
13.	Only outstanding performance is good enough in my family.	( )	( )	( )	( )	( )	( )
14.	The happiest time in life is when you are a child.	( )	( )	( )	( )	( )	( )
15.	I am open about my feelings	( )	( )	( )	( )	( )	( )
16.	I am terrified about gaining weight	( )	( )	( )	( )	( )	( )
17.	I trust others	( )	( )	( )	( )	( )	( )
18.	I feel alone in the world	( )	( )	( )	( )	( )	( )

		ALWAYS	USUALLY	OFTEN	SOMETIMES	RARELY	NEVER
19.	I feel satisfied with the shape of my body	( )	( )	( )	( )	( )	( )
20.	I feel generally in control of things in my life.	( )	( )	( )	( )	( )	( )
21.	I get confused about what emotion I am feeling	( )	( )	( )	( )	( )	( )
22.	I would rather be an adult than a child	( )	( )	( )	( )	( )	( )
23.	I can communicate with others easily	( )	( )	( )	( )	( )	( )
24.	I wish I were someone else	( )	( )	( )	( )	( )	( )
25.	I exaggerate or magnify the importance of weight	( )	( )	( )	( )	( )	( )
26.	I can clearly identify what emotion I am feeling	( )	( )	( )	( )	( )	( )
27.	I feel inadequate	( )	( )	( )	( )	( )	( )
28.	I have gone on eating binges where I have felt that I could not stop	( )	( )	( )	( )	( )	( )
29.	As a child, I tried very hard to avoid disappointing my parents and teachers	( )	( )	( )	( )	( )	( )
30.	I have close relationships	( )	( )	( )	( )	( )	( )
31.	I like the shape of my buttocks	( )	( )	( )	( )	( )	( )
32.	I am preoccupied with the desire to be thinner	( )	( )	( )	( )	( )	( )
33.	I don't know what's going on inside me	( )	( )	( )	( )	( )	( )
34.	I have trouble expressing my emotions to others	( )	( )	( )	( )	( )	( )
35.	The demands of adulthood are too great	( )	( )	( )	( )	( )	( )
36.	I hate being less than best at things	( )	( )	( )	( )	( )	( )
37.	I feel secure about myself	( )	( )	( )	( )	( )	( )
38.	I think about bingeing (overeating)	( )	( )	( )	( )	( )	( )
39.	I feel happy that I am not a child anymore	( )	( )	( )	( )	( )	( )
40.	I get confused as to whether or not I am hungry	( )	( )	( )	( )	( )	( )
41.	I have a low opinion of myself	( )	( )	( )	( )	( )	( )
42.	I feel that I can achieve my standards	( )	( )	( )	( )	( )	( )
43.	My parents have expected excellence of me.	( )	( )	( )	( )	( )	( )
44.	I worry that my feelings will get out of control	( )	( )	( )	( )	( )	( )
45.	I think my hips are too big	( )	( )	( )	( )	( )	( )
46.	I eat moderately in front of others and stuff myself when they're gone	( )	( )	( )	( )	( )	( )

		ALWAYS	USUALLY	OFTEN	SOMETIMES	RARELY	NEVER
47.	I feel bloated after eating a small meal	( )	( )	( )	( )	( )	( )
48.	I feel that people are happiest when they are children.	( )	( )	( )	( )	( )	( )
49.	If I gain a pound, I worry that I will keep gaining.	( )	( )	( )	( )	( )	( )
50.	I feel I am a worthwhile person	( )	( )	( )	( )	( )	( )
51.	When I'm upset, I don't know if I am sad, frightened or angry.	( )	( )	( )	( )	( )	( )
52.	I feel that I must do things perfectly or not at all.	( )	( )	( )	( )	( )	( )
53.	I have the thought of trying to vomit in order to lose weight.	( )	( )	( )	( )	( )	( )
54.	I need to keep people at a certain distance (I feel uncomfortable if someone tries to get too close)	( )	( )	( )	( )	( )	( )
55.	I think my thighs are just the right size.	( )	( )	( )	( )	( )	( )
56.	I feel empty inside (emotionally)	( )	( )	( )	( )	( )	( )
57.	I can talk about personal thoughts or feelings	( )	( )	( )	( )	( )	( )
58.	The best years of your life are when you become an adult	( )	( )	( )	( )	( )	( )
59.	I think my buttocks are too large	( )	( )	( )	( )	( )	( )
60.	I have feelings I can't quite identify	( )	( )	( )	( )	( )	( )
61.	I eat or drink in secrecy	( )	( )	( )	( )	( )	( )
62.	I think my hips are just the right size	( )	( )	( )	( )	( )	( )
63.	I have extremely high goals	( )	( )	( )	( )	( )	( )
64.	When I am upset, I worry that I will start eating.	( )	( )	( )	( )	( )	( )