

***Narcissism, Physical Self-Efficacy and Exercise Addiction:  
A Comparative Study of Runners and Aerobics Exercisers.***

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**The author hereby declares, that unless specifically indicated to the contrary,  
this study is the result of her own work.**

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## ***ABSTRACT***

Narcissism and physical self-efficacy and exercise commitment were investigated in ‘addicted’ and ‘non-addicted’ runners ( $n = 112$ ) and aerobics exercisers ( $n = 57$ ) and compared to a control group of non-exercisers ( $n = 42$ ). Runners and aerobics exercisers were assigned to an ‘addicted’ or ‘non-addicted’ group using Hailey and Bailey’s (1982) Negative Addiction Scale. All subjects completed biographical questionnaires, the Narcissistic Personality Inventory (NPI) and the Physical Self-Efficacy Scale (PSE). Although both narcissism and physical self-efficacy were found to play a significant role in exercise adoption, narcissism was the only significant variable when comparing ‘addicted’ and ‘non-addicted’ exercisers. Differences between the runners and aerobics exercisers were found with the aerobics exercisers exhibiting higher narcissistic tendencies than the runners. The runners were assigned to one of four quadrants based on their level of commitment and addiction to running and the Perceived Physical Ability subscale of the PSE and the Self-Sufficiency subscale of the NPI produced significant differences between the four quadrants. Taken together, the results suggest that addicted exercisers have the tendency to exhibit narcissistic traits, however the interaction with physical self-efficacy is equivocal. The findings are discussed with reference to relevant personality theory and implications for future research in this area.

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## CHAPTER ONE

### INTRODUCTION

*"I have run since infancy ... It's the passion of my life. Running as long as possible - I've made that into a sport. I have no other secrets. Without running I wouldn't be able to live."*

(Waldemar Cierpinski, 1980, cited in Weinberg & Gould, 1995, p.369).

#### 1.1. EXERCISE AND ITS BENEFITS:

Although the Greek philosophy - *mens sana in corpore sano* - (a healthy mind in a healthy body) has been around for thousands of years (Sachs, 1991), it is only over the past two decades that much attention has been placed on aerobic exercise<sup>1</sup> as a therapeutic means of promoting improved physical and psychological health and well-being.

It has become a widely reported phenomenon that regular participation in physical, aerobic exercise results in physiological benefits (Kirkcaldy & Shephard, 1990). Exercise is universally accepted as a prophylactic agent and therapeutic aid in many different physical illnesses (e.g. heart conditions, diabetes and arthritis) (De la Torre, 1995) and has been shown to increase protection against coronary heart disease, provide protective benefits against colon cancer in men and certain reproductive cancers in women (Marcus, Bock, Pinto & Clark, 1996). Physical activity is further recommended in prevention and treatment of obesity and facilitates weight maintenance in men and women. It is also believed to help prevent other diseases such as osteoporosis in post-menopausal women (Marcus *et al.*, 1996). The American College of Sports Medicine have suggested that in order to receive these benefits from exercise, exercise must be performed for at least 20 to 30 minutes, 3 to 5 times a week at 60% to 85% of maximal heart rate (Weinberg & Gould, 1995).

Exercise is also thought to alleviate psychological distress and engender positive psychological health (Kirkcaldy & Shephard, 1990). A long list of psychological benefits has been postulated, some of which include positive mood and perceived health shifts, increased sense of self-sufficiency and personal adjustment, enhanced body-image and improved self-concept. Cognitive and perceptual processing is facilitated, type A behaviour is reduced, stress management skills are

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<sup>1</sup> "Aerobic Exercise is physical activity that increases the activity of pulmonary and cardiovascular systems. During aerobic exercise the body uses and transports oxygen to the working muscles to maintain the activity" (Weinberg & Gould, 1995, p.363). It includes activities such as brisk walking, running, swimming, aerobics (step and dance), cross-country skiing and rowing.

improved and overall psychological performance is bolstered. Regular exercise is also associated with reduced anxiety and depression (Weinberg & Gould, 1995) and furthermore has been recommended as a therapeutic tool in the treatment thereof (Kirkcaldy & Shephard, 1990).

Although a cause and effect explanation and the mechanism through which the psychological benefits may occur has not yet been defined, various explications have been attempted. According to Kirkcaldy & Shephard (1990), the psychological benefits from exercise may be caused directly or indirectly. In terms of a direct cause, the benefits may be a result of the secretion of mood-altering chemicals which increases the individual's level of arousal and decreases autonomic reactions to stress. They also posit that exercise may have a less direct benefit in that it increases a sense of self-efficacy, enhances body image and reduces fatigue. Their final explanation for the benefits of exercise on mental well-being is an indirect one where exercise may increase social contacts, develop positive expectations and offer opportunities for distraction (Kirkcaldy & Shephard, 1990).

## **1.2. RATIONALE FOR THE STUDY:**

Despite the reported benefits of exercise, there can be negative aspects associated with long-term participation in exercise, specifically running, which have received less attention (Thornton & Scott, 1995). According to Rodin (1992, cited in *ibid.*), many exercisers may exercise too much and consequently reverse the positive effects of the activity resulting in fatigue, muscle soreness and negative psychological sequelae such as depression. These consequences may lead to a high rate of 'drop out' from exercise or in extreme forms, 'burnout', which are analogous to the effects of prolonged stress. As a result, this type of over-exercising has been conceptualised as a behavioural dependence or addiction, and various studies have been conducted on what constitutes and causes exercise addiction.

Owing to a growth towards a more technology-based culture, with consequent time for leisure, exercise for pleasure or perceived health benefits appears to be on the rise in our society. With an increasing preoccupation with health, exercise is fast becoming an integral part of our Western Euro/American culture. According to De la Torre (1995) latest issues of popular magazines confirm the continued growth in interest and preoccupation with exercise. As a result, he believes that clinicians may find more cases amongst their patients for whom exercise may represent a measure of psychopathology. If not aware of the potential complications exercise might portray, the psychotherapist may naively conclude that exercise in the patient's lifestyle is a good trait and therefore, may not explore the frequency, discipline, devotion and need for exercise. Furthermore,

for the sports psychologist in particular, a fuller understanding of exercise addiction can have therapeutic benefits, in that s/he will be alerted to certain important variables involved and can counsel the exerciser accordingly.

Exercise in itself is not inherently addictive, and the research into why only some exercisers become addicted to the activity is equivocal. It appears that the relationship between the individual and the activity determines the nature of addiction and hence, research which looks at those personality factors that expedite a tendency towards exercise addiction can be beneficial in terms of enhancing our understanding of the concept and in terms of treatment.

A number of studies have focused on different personality characteristics in order to attempt to delineate a specific personality type for the addicted exerciser. Of relevance to this study are those that have indicated that the construct of narcissism may be involved in exercise addiction (De la Torre, 1995; Dervin, 1991; Deutsch, 1926 cited in De La Torre, *ibid.*; Miller, 1992; Sachs, 1981). For the purposes of this study, narcissism is viewed in developmental terms, forming a continuum from healthy, adaptive narcissism on one end to unhealthy, maladaptive narcissism on the other. Rather than pathologising subjects in terms of the narcissistic personality disorder as documented in *DSM* (APA, 1980; 1987; 1994), this study, through the employment of a measure normed on a non-clinical population, explores to what extent the addicted exerciser exhibits more narcissistic tendencies in relation to non-addicted exercisers. Although the identification of personality characteristics is important when examining exercise addiction, in order to obtain a fuller understanding of the concept, the development of cognitive biases and distortions and subsequent behaviour cannot be ignored (Loumidis & Roxborough, 1995).

As discussed above, the enhancement of self-esteem is postulated to be one of the many psychological benefits with regard to exercise. The study examines one aspect of self-esteem; that of self-efficacy beliefs and their relationship to exercise addiction. If exercise addiction leads to the reversal of the positive effects, a poor self-esteem and negative or distorted self-efficacy beliefs may be considered to play a role when studying addicted exercisers. As a result of a poor sense of self, it is postulated that the addicted exerciser is never satisfied with goals that s/he has attained and will therefore continually set higher standards with regard to his/her exercise behaviour. Furthermore, the literature suggests that a poor sense of self may manifest itself in narcissistic traits which involve a sense of grandiosity, a need to be admired and recognised as successful, a lack of, and exploitativeness, in interpersonal relationships, the inability to exhibit empathy and the preoccupation with physical beauty.

It is acknowledged that there is an ongoing debate between the *sceptical* and *credulous* views (Morgan, 1980, cited in Morris, 1995a) regarding research which involves exercise and personality traits. Furthermore the attempt to explain sports behaviour or exercise addiction on the basis of personality traits alone, is not advocated. This study's focus on narcissism and its interaction with the concept of physical self-efficacy does not negate the fact that exercise addiction is complex and should be considered to be a true biopsychosocial phenomenon. It does not assert that narcissism and physical self-efficacy beliefs are reified traits which predict and explain all exercise behaviour and addiction. Rather, the study attempts to understand the significance and importance of these variables within the multifaceted construct of exercise addiction.

## **CHAPTER TWO**

### **EXERCISE ADDICTION**

#### **2.1. INTRODUCTION:**

According to Steinberg and Sykes (1985), any activity which results in positive rewards has the propensity to develop into an addictive behaviour. Terms such as 'dependence' and 'addiction' have traditionally been associated with intoxicating substances, however in recent years a phenomenon called 'behavioural dependence' has developed including activities such as gambling, television watching, overeating, shopping, computers and so forth (Steinberg, Sykes & LeBoutillier, 1995). Dependence on aerobic exercise was first noted by Baekeland (1970) who, despite an offer to pay subjects to abstain from exercise for a month, was unable to persuade heavy exercisers to stop exercising and alter their regimen for that time period (cited in Thaxton, 1982). 'Addiction' to or dependence on running and exercise in general appears to have been conceptualised in different ways (Hauck & Blumenthal, 1992) which will be briefly presented in this chapter. What follows is a focus on exercise as a negative addiction, the measurements developed to assess such a notion and a brief discussion of a few of the causes that have been implicated in the development of exercise addiction.

#### **2.2. EXERCISE AS A POSITIVE ADDICTION:**

Although exercise addiction is thought to share a number of similarities to drug addictions, the most important being the unpleasant effects of withdrawal, recognition of both the physical and psychological advantages of regular aerobic exercise led Glasser (1976) to classify physical activity as a 'positive addiction' (cited in Summers, Sargent, Levey & Murray, 1982). Kostrubala (1976) suggested a similar notion (cited in Sachs, 1991) and Peele (1981) used the term 'healthy habit' (cited in Sachs and Pargman, 1997). Glasser's (*ibid.*) concept of exercise addiction being 'positive' was because of the psychological strength and increased life satisfaction that can be gained from such dependence. Exercise adds to the quality of life, complementing and supplementing other aspects of people's existence and becomes an effective tool for managing stress, anxiety and depression (Sachs & Pargman, 1997). According to Weinberg & Gould (1995) exercisers who are positively addicted are those who are involved in regular physical activity and regard exercise as important. Nevertheless, these people are able to successfully integrate exercise with other aspects of their life such as work, family and friends.

### 2.3. EXERCISE AS A NEGATIVE ADDICTION:

Recent research and clinical reports have challenged the notion of the addictive tendencies of regular exercisers as being 'positive'. Morgan (1979) cited a number of examples of runners who ran, despite adverse circumstances (e.g. severe injuries and/or debilitating pain) or professional or family responsibilities, that may indicate periodic abstinence from their running schedule (cited in Sachs & Pargman, 1997). Furthermore, research exists which suggests that the runner develops a tolerance and must continually increase his/her activity in terms of frequency and/or duration in order to maintain satisfaction (Butterworth, 1997). Whiting (1994) offers a comprehensive definition of exercise addiction:

*"Exercise addiction is characterised by dependency on physical activity in one or more of its forms, and by withdrawal symptoms if participation is denied. Dependency manifests itself in an excessive dominance of exercise in everyday life, often to the detriment of other facets such as the family, social contacts or work. Withdrawal symptoms include, on the psychological front, feelings of nervousness, guilt, anxiety and lowered self-esteem and, on the physiological front, headaches and physical discomfort"* (cited in Cripps, 1995, p.22).

Various terms are used in the literature to describe this phenomenon as being negative: 'running addiction' (Sachs & Pargman, 1981); 'negative addiction' (Morgan in De Coverley Veale, 1987); 'committed runner' (Thornton & Scott, 1995); 'commitment to running' (Carmack & Martens, 1979 in Sachs & Pargman, 1997); 'compulsive runner' (Abell, 1975 in Weinberg & Gould, 1995); 'an obsession' (Waters, 1981, in *ibid.*); 'obligatory runners' (Yates *et al.*, 1983 in de Coverley Veale, 1987); 'exercise abusers' (Hauck and Blumenthal, 1992); 'hard-core addicts' (Estok & Rudy, 1986); 'exercise dependence' (De Coverley Veale, 1987, Pierce, 1993, Sachs & Pargman, 1997) and 'excessive exercise' (Loumidis & Roxborough, 1995).

### 2.4. EXERCISE ADDICTION AS A PROCESS:

Authors appear to agree that exercise addiction should be conceptualised in terms of a process or continuum rather than a condition (Peele, 1981 (cited in Sachs & Pargman, 1997); Sachs, 1991, Cripps, 1995; Sachs & Pargman, 1997). In other words, it is not an all-or-nothing state which is unambiguously present or absent. Rather it is an extension of ordinary, beneficial behaviour which

develops into a pathological habit, dependence or compulsion.<sup>2</sup> According to Sachs & Pargman (1997) participation in running becomes a regular part of daily activity and for most, this level of involvement represents a 'healthy habit'. Some exercisers however may shape various aspects of their life (professional, social, diet and leisure activities) around their running. It is at this point that running becomes a compulsion, habit or addiction. Similarly, Cripps (1995) notes that the continuum ranges from no participation right through to obsessive, addictive, participative behaviour called exercise addiction. While some regular runners may drop out of their regular running routines as a result of injury, boredom and non-attainment of goals, some will continue to run for months and years with stubborn regularity regardless of injuries, weather, interpersonal relations etc. (Sachs, 1981 and Sachs & Pargman, 1979).

De la Torre, (1995) posits that exercise, like alcohol, has a wide range of manifestations from the healthier, more social to the primitive and addictive. He believes that exercise abuse has its own clinical manifestation, psychological profile and internal dynamic and within these terms he distinguishes between three categories of exercisers:

**2.4.1. Healthy-neurotic Exercisers:** are individuals who do not lose control over their exercise routines. Once s/he has accomplished his/her goal s/he does not feel compelled to extend it and genuine satisfaction from his/her exercise program is obtained. He goes on to explain that s/he has an integrated superego resulting in a rewarding sense of accomplishment, raised self-esteem and the desired positive results. When the healthy-neurotic exerciser is unable to exercise, s/he experiences feelings of disappointment rather than undue guilt. Furthermore this individual is able to modify his/her exercise routine in order to engage in social occasions.

**2.4.2. Compulsive Exercisers:** For these individuals, exercise provides a sense of control over the body and the routine affords predictable order and discipline central to his/her character. S/he may experience a subtle feeling of moral superiority because s/he views himself as healthier and in better shape than others who he may envy in other spheres (e.g. academic, social, wealth).

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<sup>2</sup> It is within this framework of exercise addiction that the present study explores positive and negative addiction. Although this study utilises the terminology 'addicted' or 'non-addicted', the exercisers are viewed in terms of those who have the tendency to be **more** or **less** addicted respectively.

**2.4.3. Addicted Exercisers:** According to De la Torre (*ibid.*) this individual substitutes shame and helplessness with mastery and activity. S/he is unable to experience satiation and experiences primitive and painful affect resulting in excessive measures for control via exercise. Interruption of their exercise routine is intolerable.

As with drugs, it is not necessarily the activity itself but the involvement the person forms with the activity or events (Morgan, 1979 in Sachs & Pargman, 1997). Exercise adherence can be viewed as a positive addiction when the individual is able to control the activity. It appears that once the activity becomes increasingly encompassing and begins to control the individual, eliminating other choices in life, the addiction becomes negative. The over-zealous training manifests itself in psychological and physical distress such as decreased ability to concentrate, listlessness, fatigue, lapses in judgement, impaired social activity and work productivity and constant thoughts about running. The individual appears to be consumed by the need to run and the addiction destroys the ability to cope with or gain gratification from anything else (Peele, 1981, cited in Sachs & Pargman, 1997).

## **2.5. PRIMARY AND SECONDARY EXERCISE ADDICTION:**

Yates, Leehay and Shisslak (1983) assert that many 'obligatory runners' have similar characteristics to those with Anorexia Nervosa in terms of inhibition of anger, high self-expectations and tolerance of physical discomfort (cited in De Coverley Veale, 1987). Similarly, Sacks (1987, cited in Loumidis and Roxborough, 1995) argued that although excessive exercise and anorexia may exist independently, they both share a central narcissistic dynamic which is driven by either the pursuit of physical effectiveness (in excessive exercisers) or the pursuit of physical attractiveness (in anorexics). However, Blumenthal, O'Toole and Chang (1984) demonstrated that obligatory runners score significantly lower psychopathological MMPI scores when compared with individuals with anorexia nervosa, suggesting that although certain personality variables may be associated with excessive exercising, they may not be severe enough to warrant a label of psychopathology (cited in Loumidis & Roxborough, 1995). In order to further enhance our theoretical understanding of this phenomenon De Coverley Veale (1987) distinguishes between primary and secondary exercise dependence, where primary dependence is not related to any other mental disorder and exercise is an end in itself. Secondary exercise dependence refers to the presence of an eating disorder where exercise is utilised in order to lose weight and allay the intense fear of fatness (*ibid.*).



In a later article, Veale (1995, p.2) proposes 4 operational diagnostic criteria for exercise dependence which are in the DSM-IV or ICD-10 format:

**Table 2.1.: Diagnostic Criteria for Exercise Dependence:**

1.	Preoccupation with exercise which has become stereotyped and routine.
2.	Significant withdrawal symptoms in the absence of exercise (for example, mood swings, irritability, insomnia).
3.	The preoccupation causes significant distress or impairment in their physical, social, occupational or other important areas of functioning.
4.	The preoccupation with exercise is not better accounted for by another mental disorder (e.g. as a means of losing weight or controlling calorie intake as in an eating disorder).

## **2.6. EMPIRICAL MEASUREMENTS OF EXERCISE ADDICTION:**

In order to investigate the concept of exercise addiction it is necessary to operationally define and measure addictive exercise behaviour. However, although a general definition of exercise addiction can be provided, there is a paucity of standardised psychometric measures (Hauck & Blumenthal, 1992) which measure the stages and time frame involved in the addictive process (Sachs, 1981). Methods of measuring exercise addiction appear to be unsystematic and range from those using behavioural criteria to those using more objective measurement scales, with very few of these scales reporting psychometric properties. A review of the some of the scales that have been developed to measure exercise addiction follows:

**2.6.1.** Sachs and Pargman (1979) and Yates *et al.* (1983, cited in Hauck & Blumenthal, 1992) utilised an interview approach to evaluate exercise addiction. Although an interview method is flexible in that it may elicit more information than a questionnaire or inventory, it can be subjective, time consuming, potentially expensive and yields qualitative rather than quantitative data (*ibid.*).

A number of questionnaires have been developed in an attempt to objectively measure addictive exercise behaviour:

**2.6.2.** Carmack and Martens (1979) developed a 12-item, Likert-scored "Feelings about Running" scale which assesses commitment to running (defined here as positive addiction to running) (cited in Sachs & Pargman, 1997; Hauck & Blumenthal, 1992). Albeit that the scale yields a high reliability coefficient ( $KR-20 = 0.97$ ) and is an extremely popular instrument for measuring addiction to running (Sachs & Pargman, 1997), runners have been found to consistently score high on this measure (Hauck & Blumenthal, 1992). Sachs and Pargman (1997) note that there appears to be a desirability or demand factor inherent in the scale. Furthermore, although designed to measure positive addiction, a number of items can be construed as negative components of addiction. Finally, although runners' self-perceptions of addiction were predictive of commitment to running scores, the term addiction was not operationalised for the subjects and hence leaves the true meaning of this term open to interpretation (Hauck & Blumenthal, 1992).

**2.6.3.** Joseph and Robbins (1981) incorporated a measure of addiction in their "Running Survey" which, according to Sachs and Pargman (1997), may prove to be a valuable instrument. However, no validity or reliability statistics have been published.

**2.6.4.** A 14-item Negative Addiction Scale was created by Hailey and Bailey (1982) designed specifically to assess the psychological aspects of negative addiction and to determine if the extent of addiction was related to the length of running history. Significant differences were found between the groups of runners demonstrating the progression of stages of the development of addiction, however no information regarding the running frequency, duration or intensity of the respective groups of runners was elicited (Hauck & Blumenthal, 1992). Despite little information on the reliability and validity of the NAS being available, previous studies have employed the scale with some success (Anderson, Basson, Geils & Farman, 1997; Thornton and Scott, 1995 & Furst and Germone, 1993). The NAS will thus be utilised for the purpose of this study.

**2.6.5.** Blumenthal, O'Toole and Chang (1984, cited in Hauck & Blumenthal, 1992) developed a 21-item, true/false questionnaire which was designed to measure compulsive exercise based on descriptions of obligatory exercisers as described by Yates *et al.* (1983 in *ibid.*). Although scores on the 'Obligatory Running Questionnaire' were able to distinguish runners from controls, more specific psychometric properties of the instrument have not been published.

**2.6.6.** Estok and Rudy (1986) initially created a dichotomously scored, 10-item Running Addiction Scale (RAS). This was subsequently modified including 7 additional items and a Likert scoring format with an internal reliability of 0.66 (Estok & Rudy, 1989, cited in Hauck & Blumenthal, 1992). The authors attempted to correlate addiction scores with psychological factors and found a positive relationship between RAS scores and anxiety. A negative relationship between self-esteem and RAS scores was found. According to Hauck and Blumenthal (1992), the authors have acknowledged the need for the RAS to be further refined.

**2.6.7.** Chapman and DeCastro (1990, cited in Hauck & Blumenthal, 1992) developed a second 11-item, Likert scored Running Addiction Scale in order to measure the psychological aspects of running addiction. Although inter-item reliability was good with a Cronbach coefficient of 0.82, inherent difficulties were found in establishing the scale's validity. As with the "Feelings about Running" scale, the scores were correlated with self-rated addiction scores without the term 'addiction' being operationalised (cited in Hauck & Blumenthal, 1992).

In general, existing exercise addiction scales appear to lack psychometric validation and some of the scales have utilised non-operationalised ratings of self-perceived addiction in order to report concurrent or discriminant validity. According to Hauck and Blumenthal (1992), there needs to be a clearer distinction between addictive exercise (conceptualised as either positive or negative) and exercise commitment. Furthermore they assert that additional research investigating the link between addiction scores and measures of social, work and interpersonal functioning should be undertaken. They suggest that the effectiveness of the addiction scale scores in predicting psychological and physiological withdrawal symptoms would be useful. Sachs (1981) states that it is important for measurements of exercise addiction to be able to identify the process by which addiction develops: in other words the stages the individual passes through, should be identified.

## **2.7. THE CAUSE OF EXERCISE ADDICTION:**

Both physiological and psychological etiological explanations for exercise addiction appear to remain unclear. It is accepted that in order to develop an addiction to exercise, one has to participate on a regular basis. The negative aspects emerge only once the individual has progressed into and through the stage of positive addiction. According to Sachs (1981), opinions regarding the time frame for an addiction to develop differ, however 1 month to 2 years has been suggested as being sufficient for an addiction to develop. It follows then that an understanding of the development of exercise addiction requires an exploration into the motivating factors for exercise adherence.

Numerous factors which are related to exercise adherence have been cited: the role of significant others, concern with general health; weight reduction; attainment or non-attainment of goals; and injuries (Sachs, 1981 and Sachs & Pargman, 1997). Nevertheless attempts to identify the actual process by which exercise addiction develops (Sachs, 1981; Sachs and Pargman, 1979 & Jacobs, 1980) have failed (cited in Sachs, 1997).

Dishman, Ickes and Morgan (1980) assert that self-motivation is a critical factor in the development of exercise addiction (cited in *ibid.*). In other words, the person needs to be motivated to continue running for an extended period of time. The runner who adheres to the activity is "buoyed by positively and negatively reinforcing contingencies" (Sachs, 1981, p.121). The positive comments the individual receives regarding his/her weight loss, how good s/he looks together with the social atmosphere of running with friends, all constitute positive reinforcement. Various definitions of exercise addiction indicate that addicted runners suffer from both psychological and physiological withdrawal symptoms when they are not able to run on days when they expect to run. The fear of experiencing these withdrawal symptoms if a run is missed is an example of a negative reinforcing consequence. Both physiological and psychological explanations for withdrawal symptoms have been described.

### **2.7.1. Physiological Perspective - The Endorphin Hypothesis:**

Speculation about the concept of physiological addiction to exercise is prevalent in the academic literature and press (Robbins & Joseph, 1985). Amongst other researchers, Harber & Sutton (1984) have suggested that sustained, intensive exercise leads to an increase in the release of mood-altering neuro-transmitters namely, enkephalin and beta-endorphins into the bloodstream or peripheral circulation. These 'endogenous morphines' or natural opiate peptides are thought to be responsible for altered states of consciousness during running commonly known as the 'runner's high' (cited in Kirkcaldy & Shephard, 1990). They are thought to alter pain thresholds (Hays et al, 1984, cited in *ibid.*) and produce a state of euphoria (Weinberg & Gould, 1995) which in turn is hypothesised as providing the physiological basis of exercise addiction (Yates *et al.*, 1983 cited in De Coverley Veale, 1987).

Steinberg, Sykes and LeBoutillier (1995), note that if endorphins are released into the bloodstream and administered externally by means of intravenous injection, they are, like opiate drugs, addictive and can produce withdrawal symptoms, tolerance and craving. Glasser (1978) thought that the endorphin might be the "missing link" with regard to positive addiction and conducted research (1979) in order to ascertain how naltrexone (which blocks the action of endorphins) affected

subjective evaluations of running (cited in Sachs & Pargman, 1997). However, no positive relationship was found. According to Sachs and Pargman (1997), related work with an opiate blocker called naloxone has both supported (Haier, Quaid and Mills, 1981, cited in *ibid.*) and failed to support (Markoff, Ryan and Young, 1982, cited in *ibid.*) previous findings.

Although all studies seem to acknowledge that endogenous opioid peptides (as well as other hormones and neurotransmitters) are involved in physical exercise, various flaws and caveats are inherent in the evidence and the findings regarding the relationship between endorphins and exercise addiction appear to be equivocal (de Coverley Veale, 1987).

### **2.7.2. Psychological Perspective: The Distraction Hypothesis**

The distraction hypothesis conceptualises exercise as 'time out' from stressful life events (Weinberg & Gould, 1995). Sacks (1981) views running as an adaptive response to losses affecting self-esteem and producing intrapsychic pain. Whilst Robbins and Joseph (1985) accept that physiological changes may occur in the bodies of runners which result in dysphoria when deprived of the run, they delineate behavioural mechanisms related to the distraction hypothesis which are believed to contribute to the experience of withdrawal symptoms.

Robbins & Joseph (1985) attempt to explain exercise withdrawal symptoms in two ways. Firstly they discuss individuals who run for the therapeutic benefits of running. They posit that for some, withdrawal symptoms are an indication of insufficient stress reduction or incomplete stress avoidance when a run is missed (cited in Sachs & Pargman, 1997). In other words, the negative sensations that are experienced may represent a return of dysphoria or anxiety once the mood-altering effects of the run begin to dissipate. Running masks, and temporarily reduces, the anxiety and depression, however it does not alter the endogenous or exogenous sources of these affects (Joseph & Robbins, 1981). For others, running may be employed as an exclusive coping mechanism during periods of stress or times of anxiety and depression. This exclusive reliance on running, may cause other means of coping to atrophy leaving the individual with no effectual ways of handling stress when running is not possible (*ibid.*).

Secondly Robbins & Joseph's (1985) describe individuals who run because it is a "novel source or self-fulfilment, accomplishment, and mastery" (p.25). These runners may begin to feel more confident and gratified, as if they have more control over their lives and they may gain more self-acceptance since beginning to run. Withdrawal symptoms for these people may represent a "loss of the day-to-day reinforcement of positive self-feeling" (*ibid.*, p.25) or the "withdrawal of a self-

esteem enhancing activity" (*ibid.*, p.25) rather than insufficient stress reduction or incomplete stress avoidance. According to Altheide & Pfuhl (1980, cited in *ibid.*) and Zarski, West & Bubenzer (1982, cited in *ibid.*), running may become the centre of an individual's self-image and deprivation of a run may undermine or eliminate a treasured aspect of personal identity. According to Robbins & Joseph (1985) those who run for predominantly mastery rewards should experience withdrawal symptoms more often than those who run for the therapeutic benefits.

### **2.7.3. Personality Determinants of Sport Participation and Motivation:**

An area which has received an enormous amount of interest is that of personality and sport - the subject of which gives rise to two questions: Firstly, will a person's personality change as a result of sport participation? Secondly, do particular personality characteristics predispose certain individuals to a particular sport at a particular level? (Bakker, Whiting & van der Brug, 1990). A variety of personality inventories have been utilised and although lacking in a theoretical base, many of these characteristics are documented in the sport personology literature (Sachs, 1981).

In the search for the difference between addicts and non-addicts there has been a quest to identify an 'addictive personality' (McMurrin, 1994) with specific characteristics, that precedes and therefore predicts addiction. Despite the 'addictive personality type' receiving little support from research into dependence on drugs, exercise investigators have continued to look with interest at personality characteristics of individuals who partake in exercise, especially runners (Steinberg & Sykes, 1985). Although there is evidence to suggest that runners are introverted, stable, low on anxiety, self-sufficient, high on self-esteem and imaginative (Sachs, 1981), there is no defined or distinguishable 'athletic personality' type (Vealey, 1992 cited in Morris, 1995a). According to Sachs (1981) the results of such research are equivocal and too problematic to justify generalisations.

Nevertheless Bakker *et al.* (1990) are optimistic about research in this area, asserting that the relationship between personality traits and sport is worthwhile pursuing, provided the research has a theoretical basis about particular personality traits. Similarly, Cox (1987, cited in Morris, 1995) posits that despite the non-significant, contradictory and atheoretical results related to personality traits and sport, personality is related to sports behaviour but accounts for a proportion of the variance only. He later (1994) maintains that such research can be enhanced if a relevant theory is used together with multivariate statistical methodology such as regression analyses (cited in Anderson *et al.*, 1997).

Anderson *et al.* (*ibid.*), utilised the underpinnings of Millon's personality theory as operationalised in the MCMI to examine personality characteristics of the 'addicted runner'. The results suggest that running addiction is correlated with certain personality dispositions, particularly the Schizotypal personality characterised by social detachment, a preference for privacy and isolation and unobtrusive aloofness associated with a tendency for behavioural eccentricities and low self-esteem (*ibid.*). Evidence of a weaker correlation between running addiction and Avoidant and Dependent personality patterns was found.

A question which remains to be answered is why only some exercisers become negatively addicted to an activity while others remain positively addicted. An initial approach is the determination of personality traits or characteristics associated with differing levels of addiction (Sachs, 1981). According to Sachs & Pargman (1997), the behaviour of hard-core exercise addicts resembles that of other major addictions and an association of certain traits with addiction suggests areas of research to be investigated in the search for causal and/or correlational factors (Sachs, 1981). A number of authors have suggested a relationship between narcissistic personality traits and the development of an addiction (Johnson, 1993; Doweiko, 1993 and Kohut, 1995). More specifically, a link between narcissism and motivation for exercise participation and adherence has been suggested (Sachs, 1981; Deutsch, 1926 cited in De la Torre, 1995 and Dervin, 1991). The concept of narcissism will be discussed further in Chapter Four.

#### **2.7.4 Theoretical Models in Exercise Research:**

As mentioned above, the majority of research which seeks to identify an '*exercise personality*' lacks a theoretical rationale and few conclusive results have been drawn from these atheoretical approaches (Feltz, 1992, cited in Marcus, Bock, Pinto & Clark, 1996). More recently, various psychological theories, in particular cognitive models, have been adapted to create theoretical models of the psychological determinants of exercise adherence (*ibid.*). Amongst others, models and theories such as the Health Belief Model, the Theory of Reasoned Action, Social Cognitive Theory, the Theory of Planned Behaviour, the Decision Theory, the Relapse Prevention Model and the Transtheoretical Model have been used as a means of describing exercise behaviour (Marcus *et al.*, 1996; Dishman, 1993). Social Cognitive Theory is an integration of operant conditioning, social learning theory and cognitive psychology and examines the interaction of personal, behavioural and environmental factors in the determination of exercise participation. It includes the notion of self-efficacy which is frequently cited as a factor in sport performance and exercise adoption and adherence. Self-efficacy receives special attention in Chapter Three.

### 2.7.5. Commitment to Running:

Sachs and Pargman (1997) propose that because regular participation does not necessarily indicate an individual is addicted, motivation for running should be conceptualised through a dynamic, two-factor, as opposed to a unidimensional model. Their 'Model of Participation in Running' consists of two axes: a horizontal axis labelled *Addiction to Running* i.e. Psychobiologic dependence which is addiction to running as defined earlier, with the presence of withdrawal symptoms and a vertical axis labelled *Commitment to Running*.

Although Carmack and Martens (1979) used the term 'commitment to running' in a way that was synonymous with addiction, this study employs the term commitment as used by social psychologists which describes why people continually involve themselves in activities or stay in relationships (cited in Scanlan & Simons, 1992).

Scanlan & Simons (1992) propose a sport commitment model which is based on concepts from Kelley & Thibaut's (1978) interdependence theory and Rusbult's (1980) investment model (cited in *ibid.*). They define sport commitment as a "psychological construct representing the desire and resolve to continue sport participation" (Scanlan, Simons, Schmidt, Carpenter & Keeler, 1991, cited in *ibid.*, p.201) and can be conceptualised both to sport in general or to a specific activity. Their model suggests that commitment to sport is a function of sport enjoyment, attractiveness of involvement alternatives, personal investments in participation and social constraints. They maintain that the greater enjoyment (*sport enjoyment*) an individual derives from a particular activity and the greater the expenditure in terms of time, effort and money (*personal investments*), the greater the commitment. The more attractive the alternative to the current activity (*involvement alternatives*) and the higher the *social constraints*, the lower commitment to sport. *Involvement opportunities* include things such as the possibility for sport mastery, to increase social contacts or to obtain extrinsic rewards (*ibid.*).

⊗ In contrast to Sachs & Pargman (1997), the above model focuses strictly on the psychological attachment to an activity and does not address the actual probability of the individual's participation or social or physiological factors. Rather, it conceptualises sport commitment solely in terms of cognitive and affective factors in an individual's commitment to continue with a particular sport.

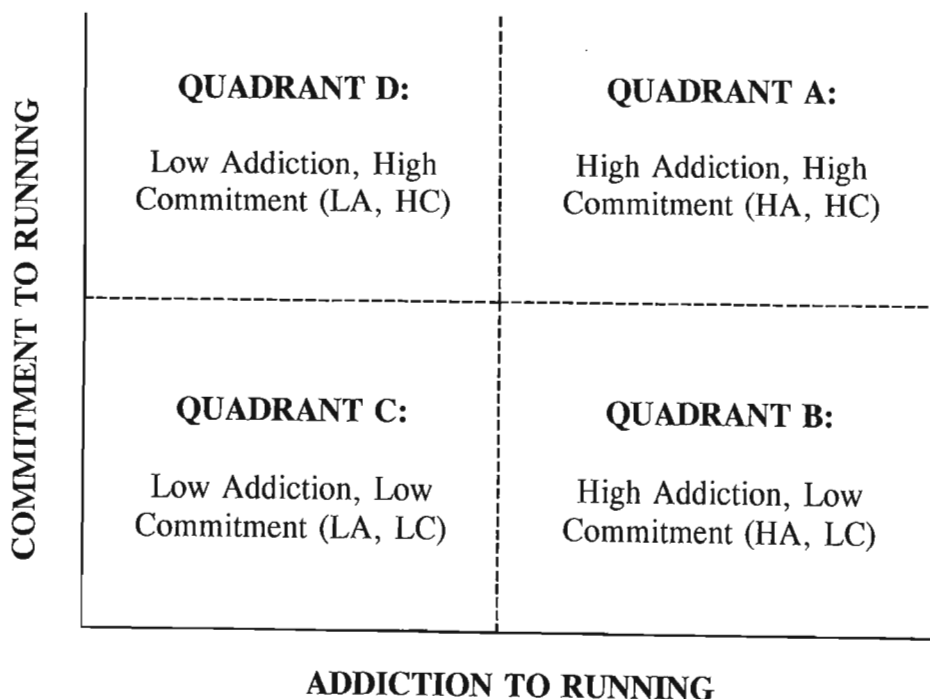
→ The model does, however illustrate that individuals who are equally committed to a sport may be so as a result of widely differing psychological states. For example, one may be committed as a result of low social constraints, while another as a result of high personal investments.



Sachs (1981) distinguishes between addiction and commitment to running asserting that addiction refers to the psychological relationship of the individual to running while commitment represents the cognitive-intellectual aspects of this relationship. He asserts that commitment to running is a multifaceted phenomenon consisting of cognitive-intellectual motivation associated with numerous social, psychological and physiological factors. For example, time spent reading and thinking about running; frequency of competition, money spent on running books and magazines, changes in eating, sleeping and other lifestyle patterns to accommodate the daily run and the intensity and duration of running itself. S/he does not run for altered states of consciousness or escape from depression but for health and social reasons, money, prestige, power and possibly narcissism. The committed runner does not necessarily enjoy running and unlike the addicted runner who runs for psychological and physiological reasons, does not seem to suffer from withdrawal symptoms if a run is missed (Carmack & Martens, 1979; Jacobs, 1980, cited in Sachs, 1981 and Sachs & Pargman, 1979). According to Sachs (1981) commitment first develops before an individual can become addicted to exercise. Of importance is to determine the factors involved in the transition from the committed but not addicted to the committed **and** addicted runner.

Sachs and Pargman's (1997) model of running participation delineates four quadrants as shown below which defines the relationship between commitment and addiction to running where each quadrant is hypothesised to categorise a different "type" of runner.

**Figure 2.1. Sachs and Pargman's (1997) Model of Participation in Running. Four Quadrants according to Levels of Running Addiction and Commitment**



**2.7.5.1. Quadrant A:** is defined as *The Truly Addicted Runner* with high levels of commitment and addiction to running. "This person's lifestyle centres on regular (usually daily) running, and motivation factors have progressed beyond interest in keeping in shape or reducing stored body fat" (Sachs & Pargman, 1997, p.245). They seek psychological well-being through their running and try to avoid the withdrawal symptoms which manifest if they stop.

**2.7.5.2. Quadrant B:** Those who are addicted to running but not totally committed to a regular schedule would be placed in this quadrant. In other words, although addiction is a characteristic of these runners, social environmental agents (for example family, work or school) possibly take priority and interfere with a regular running schedule.

**2.7.5.3. Quadrant C:** contains the individual who runs occasionally and is characterised by low levels of both addiction and commitment. Although this individual may experience some guilt feelings if a run is missed, s/he does not experience acute withdrawal symptoms associated with high addiction. Their running schedule is often dictated by the absence of other physical activity and is occasional rather than regular.

**2.7.5.4. Quadrant D:** These individuals are highly committed individuals who are not addicted to participation. Quadrant D runners run for the health and social reasons and seldom progress to the stage of negative addiction as defined in 2.3. Their motives for running are not for the euphoria, runner's high or an escape from depression but rather health and social reasons such as money, prestige, power and narcissism (Sachs & Pargman, 1997). Perhaps these runners are positively addicted to running as described by Glasser (1976, cited in Summers *et al.*, 1982), however very little in the literature has acknowledged such runners (*ibid.*).

Movement through the quadrants is not perceived to be random and Sachs & Pargman (*ibid.*) propose that there are patterns of directions for change of location within the model as follows:

All runners begin in quadrant C. Before a movement towards higher addiction can be undertaken, the level of commitment must increase through the number of days a week the person runs. Therefore they postulate that the only possible movement from quadrant C is to quadrant D. Quadrant D runners may move towards either A or back to C. Providing commitment remains high, these runner's may develop an addiction to running which moves them into A. If for some reason such as non-attainment of goals, work or social priorities commitment decreases, the individual will move to quadrant C with a low level of addiction remaining constant and a decrease

in commitment from high to low. Quadrant A runners can only move to quadrant B. Sachs and Pargman assert that addiction will not decrease unless commitment is first lowered which will precipitate withdrawal symptoms. Within a matter of days or weeks, the individuals in quadrant B will move either back to A or to C. If the commitment remains low, addiction will continue to decrease which results in movement to quadrant C. If commitment increases the runner will return to quadrant A.

Sachs & Pargman (1997) claim quadrant B to be the least stable, and in accordance with research conducted by Conboy (1981, cited in *ibid.*), type B runners have the greatest mood changes when unable to run. A further reason for runners in this quadrant's instability is that low levels of commitment are not usually associated with high levels of addiction for longer than a few days or weeks. Quadrants A,C and D are considered as fairly stable unless changes in motivation result in shifts in the level of commitment or adherence to criteria for addiction. If movement does occur within the model it will be as described above.

**2.7.5.5. Measurements used for the Model of Running Participation:** The above model used the Carmack and Martens "Feelings about Running" scale to measure addiction. Sachs & Pargman (1997) posit that additional scales such as Joseph and Robbins' (1981) "Running Survey" and Sachs's (1981) measure of withdrawal symptoms should be used in conjunction with or instead of Carmack and Martens' scale. A basic measure for commitment, i.e. the number of days a week the person regularly runs, was used and Sachs and Pargman (1997) suggest that future researchers use a composite of cognitive-intellectual factors as cited earlier.

Joseph and Robbins (1981) have taken initial steps in this regard using eight measures of commitment including the number of miles run per week; the frequency of running; how often one raced; length of time since taking up running; number of marathons run; devotion to reading books and magazines about running; the number of friends who were runners and how many new friends since taking up running were runners. They divide runners into four types ranging from "The occasional runner" through to the individual where "running is the most important commitment".

**2.8. SUMMARY:**

Chapter two has offered a review on the literature regarding exercise as a positive and a negative addiction. Albeit that the distinction between healthy and pathological addiction to exercise is clearly understandable, the actual shift from positive to negative addiction and the mechanisms by which it occurs currently seems to be an unclear and idiosyncratic area (Sachs & Pargman, 1997). A number of empirical measurements which have been developed in order to assess exercise addiction are described and it appears that no particular addiction scale has been reported as being the most effective. A discussion concerning some of the postulated causes for addiction is offered, however the current literature claims that at present, it is difficult to identify predisposing factors for an individual to develop an exercise addiction. Furthermore, it appears that the environmental and situational factors which are critical in determining whether and when a person will become addicted, are not known (Sachs, 1981).

## **CHAPTER THREE**

### **SELF-EFFICACY**

#### **3.1. INTRODUCTION:**

Hall (1995) posits that Bandura's global social cognitive-theory may be useful in determining participation motivation of people addicted to exercise. Self-efficacy is a major component of this theory, and according to Feltz (1992), is one of the most frequently cited psychological factors thought to modify sport performance and exercise adoption and adherence. Hence, self-efficacy has been noted as holding considerable promise for research in the exercise and physical activity domain (McAuley, 1992). The following chapter begins by introducing the basic tenets of Bandura's *self-efficacy theory*. This is followed by a focus on self-efficacy with regard to exercise addiction and substance abuse in general, and a discussion regarding the empirical measurement of self-efficacy.

#### **3.2. SELF-EFFICACY THEORY:**

Bandura's (1977, 1986) theory of self-efficacy is a 'mini-theory' embedded in the social cognitive approach which, as mentioned previously, integrates operant conditioning, social learning theory and cognitive psychology, and it attempts to delineate a dynamic process including cognitive, affective and value-related variables which are assumed to mediate choice and attainment of achievement goals (cited in Roberts, 1992). "Social cognitive theory proposes that personal, behavioural and environmental factors operate as reciprocal interacting determinants of each other" (Bandura, 1977, cited in Marcus *et al.*, 1996). Two cognitive processes have been identified as important in social cognitive theory - *self-efficacy* and *outcome expectations*.

**3.2.1. Outcome expectations** are based on a belief about the effects of a behaviour. In other words, an individual may expect an improvement in health, social approval or self-satisfaction as an outcome of exercising (Dzewaltowski, 1994). The outcomes can be classified as immediate (e.g. lowered stress level) or long-term (improvement in physique) benefits and differ from person to person depending on whether s/he perceives certain outcomes to be desirable or not (Dzewaltowski, 1989, in Morris, 1995b). An example of an outcome expectation with specific regard to exercise addiction may be an individual's worry about being perceived as a failure if s/he does not exercise or cuts back on the amount s/he exercises (Hall, 1995).

**3.2.2. Self-efficacy** is a common cognitive mechanism for mediating people's motivation, thought patterns and behaviour (Feltz, 1992) and has been defined as follows (Bandura, 1986):

*"... the belief that a person has in their capability of performing a particular task. It is a cognitive process, whereby the person forms a subjective judgement of their ability to meet certain environmental demands"* (cited in Morris, 1995b, p.145).

Due to the point that self-efficacy is subjective, reflecting what the person **believes** rather than his/her true capability, it has often been used synonymously with (Feltz, 1992), or as a conceptualisation of (Morris, 1995b; Cox, 1994) self-confidence. An individual's belief or perception that s/he is able to successfully tackle a behaviour will increase the likelihood that s/he will engage in the behaviour. An 'addicted' exerciser's self-efficacy may involve a belief that s/he can still exercise despite being injured.

It should be noted that self-efficacy is task- or behaviour-specific in that self-efficacy for exercise may be different from self-efficacy for the cessation of smoking or weight reduction (Marcus *et al.*, 1996). Researchers appear to have demonstrated that each behaviour consists of a global level of self-efficacy with varying underlying situational factors. Marcus, Selby, Niara and Rossi, (1992, cited in *ibid.*), include negative affect, resisting relapse and making time for exercise as situational factors for exercise. The idea that self-efficacy is task-specific has been expanded on by Morris (1995b) who asserts that self-efficacy can vary between different types of sport (i.e. a person can have high self-efficacy for tennis and low self-efficacy for football) as well as within one specific sport (e.g. tennis, where an individual may have high self-efficacy for his/her groundstrokes and low self-efficacy for his/her serve and volley game).

The distinction between self-efficacy and outcome expectations is as follows: Self-efficacy is a judgement of one's ability to perform whilst outcome expectations pertain to one's judgement that certain behaviours will lead to desired outcomes (Feltz, 1992). Although self-efficacy and outcome expectancy can exist simultaneously in a person's mind (Hall, 1995), and behaviour is predicted by both, Bandura (1986, cited in Feltz, 1992) asserts that self-efficacy beliefs are better predictors of performance. Efficacy expectations have been found to add to the variance in performance (Desharnais & Godin, 1986 cited in Morris, 1995b), however, research on outcome expectations is noted to be equivocal and they are thought to play a less significant explanatory role than self-efficacy in the sports context (Morris, 1995b).

### 3.2.3. Antecedents of Self-Efficacy:

Self-efficacy beliefs are a result of a complex process of self-persuasion relying on the cognitive processing of diverse sources of efficacy information (Feltz, 1992). Four sources of information: performance accomplishments, vicarious experiences, persuasion and physiological states - have been cited as the major factors or antecedents which influence the level and strength of self-efficacy (Bandura, 1986 in Morris, 1995b). It is suggested that efficacy beliefs which are based on these sources of information will determine people's motivation which is reflected in the tasks they undertake, the effort expended on the activity and their adherence in the face of difficulties (Feltz, 1992).

**3.2.3.1. Performance Accomplishments** provide efficacy information through mastery experiences. One's own experience of success provides evidence of one's capability and hence increases efficacy expectations, while failure experiences raise doubt about one's ability and decrease efficacy expectations (Feltz, 1992; Morris, 1995b).

**3.2.3.2. Vicarious Experience** refers to the efficacy information which is obtained through a social comparison with others (Feltz, 1992). If an individual is required to perform a skill which s/he has never performed before, observing someone else performing that skill successfully will enhance the individual's self-efficacy for the task (Morris, 1995b).

**3.2.3.3. Persuasion:** According to Feltz (1992), persuasive information includes verbal persuasion, self-talk, imagery and other cognitive strategies.

**3.2.3.4. Physiological State:** Physiological arousal associated with the period immediately before a performance is thought to play a role in self-efficacy (Morris, 1995b). The association of physiological arousal with fear and self-doubt will reduce self-efficacy while the association of physiological arousal with being psyched up and ready for performance, enhances self-efficacy (Feltz, 1992).

Although various studies have suggested that performance accomplishments are the most superior, convincing and dependable source of information in the cognitive process of self-persuasion (Feltz, Landers & Raeder, 1979; McAuley, 1985 and Weinberg, Sinardi & Jackson, 1982; cited in Feltz, 1992), the four sources of efficacy information are not mutually exclusive. It should be noted however, that self-efficacy can only be a major determinant of behaviour when the necessary skills and proper incentives are present.

Bandura (1977) proposes a reciprocal relationship between performance accomplishments and self-efficacy. Previous experience of performance will influence a person's level of self-efficacy, which will, in turn, influence the level of the person's next performance. This phenomenon whereby self-efficacy is thought to affect and be affected by other variables is known as *reciprocal determinism* (Morris, 1995b). Results of a study on back-diving behaviour, conducted by Feltz (1992), suggest that although a reciprocal relationship between self-efficacy and diving performance is evident, they are not equally reciprocal. While self-efficacy is a strong predictor of a first performance, second and subsequent performances become stronger predictors for the following performances, indicating that performance-based treatments can affect behaviour through other mechanisms as well as through perceived self-efficacy.

Bandura (1989, 1990) later suggests a similar reciprocal relationship between self-efficacy and thought processes (cited in Morris, 1995b). The influence of the four antecedents are cognitively mediated and it is therefore likely that all the antecedents of self-efficacy become consequences of self-efficacy at a later stage. Self-efficacy beliefs are thought to affect thought patterns which in turn will also affect cognitive motivation. In other words, self-efficacy beliefs will influence people's success or failure imagery, worry, goal intentions and attributions (Feltz, 1992). Thus, an individual's physiological state at any time may be a result of a number of physical and psychological factors including existing self-efficacy and this current state may influence self-efficacy in the immediate future (Morris, 1995b).

### **3.3. SELF-EFFICACY AND EXERCISE ADOPTION AND ADHERENCE:**

Self-efficacy theory posits that highly self-efficacious individuals are more likely to engage in a greater number of behaviours than those who have a low sense of personal efficacy (McAuley, 1992). Hence this study's hypothesis that runners and aerobics exercisers will score higher on the physical self-efficacy measure than the non-exercisers. Furthermore, self-efficacy beliefs are thought to influence personal goal-setting and mediate the relationship between goal intentions and cognitive motivation. In other words, the higher the individual's self-efficacy beliefs, the higher the goals they set themselves and the stronger the commitment is to them (Locke, Frederick, Lee & Bobko, 1984, cited in Feltz, 1992). With regard to exercise, those who perceive themselves to be efficacious in terms of their physical capabilities are more likely to adopt and maintain a lifestyle which incorporates exercise as an important factor (McAuley, 1992).



McAuley (1992) reviews the research on self-efficacy and exercise behaviour and cites a number of studies which support self-efficacy theory as being a prominent component of exercise adoption and adherence. In a study which examines the behavioural epidemiology of physical activity, self-efficacy was found to be a significant predictor in the adoption of vigorous physical as well as moderate activity and also as predicting exercise change within both categories of activity (Sallis, Haskell, Fortmann, Vranizan, Taylor & Solomon, 1986, in *ibid.*). Another study is mentioned, the results of which suggest that self-efficacy is able to predict exercise frequency and intensity at 3 months, however past exercise behaviour was the best predictor of exercise behaviour at 5 months (*ibid.*). These findings suggest that the determinants of exercise participation will differ depending on the stage of exercise being adopted.

Although the studies supporting self-efficacy as a mediating factor in exercise adoption and adherence have methodological flaws, McAuley (1992) notes that the relationship between personal perceptions of capabilities and exercise behaviour remains remarkably consistent. He suggests that, even though the relationship is modest, if efficacy cognitions can influence and enhance adherence to exercise programmes, then self-efficacy should be considered as an integral ingredient in the constellation of constituents which influence sport and exercise behaviour (*ibid.*). Although it appears that self-efficacy and exercise adoption are positively related, a negative relationship is considered when examining the notion of exercise addiction.

#### **3.4. SELF-EFFICACY AND ADDICTION:**

McMurrin (1994) delineates the utilisation of social learning principles (of which self-efficacy is central) in relation to substance use and abuse, suggesting that those individuals with a low sense of self-efficacy are more likely to become addicted to a substance and, as a result of poor coping skills, experience difficulty undertaking more adaptive behaviours. Her ideas are adopted by this study as a possible explanation for exercise addiction.

Concerning substance use, social learning theory (which is part of social cognitive theory) suggests that individuals will experiment with substances in accordance with cultural norms and the modelling behaviour of parents and peers. The early pattern of consumption will be a result of the interaction of individual differences such as biological makeup, social skills and the ability to manage emotions. As experimentation continues, so the individual experiences positive reinforcement by facilitation of social interaction and negative reinforcement through tension reduction. In a similar way, a beginner exerciser experiences the benefits of their activity.

Continued use of a substance results in the development of tolerance to the reinforcing effects and therefore increasing amounts of the substance are used. Furthermore, dependence on a substance may develop in order to avoid withdrawal symptoms. As discussed in chapter two, some exercisers continually increase their exercise intensity in order to avoid the physiological and psychological withdrawal symptoms. McMurrin (*ibid.*) illustrates the interactive element of social learning theory. She asserts that people who rely on substances for short-term positive outcomes are likely to behave repeatedly in ways that will adversely affect their social relationships and environments. Similarly, Estok and Rudy (1986) mention that addicted runners may neglect family and work responsibilities in order to run which, in turn, negatively affects interpersonal relationships with family members and hence decreases a sense of social support creating stress which leads to an increased need to run.

As described in chapter two, current literature indicates that exercise, which may have been initiated for health promotion, could result in both physical and psychological harm. Estok and Rudy (1986) highlight that this is more probable if the person runs in order to lessen awareness and cope with daily problems, turns to running as the sole source of gratification in their lives, receives negative responses from friends and family and loses self-esteem if their running performance is not good enough.

It is proposed by McMurrin (1994) that those individuals who have deficits in their social coping skills or low self-efficacy beliefs learn that substance use helps them cope in the short-term and therefore continued use and possible abuse is likely. A study conducted by Estok and Rudy (1986) which measured a related concept to self-efficacy i.e. self-esteem<sup>3</sup>, showed that despite reports of running increasing self-esteem, the addicted runner is more likely to have a lowered self-esteem. It is within this framework that this study assesses self-efficacy and exercise addiction, hypothesising that addicted exercisers are more likely to have a lower sense of physical self-efficacy than non-addicted exercisers.

The view that an individual who has a deficit in their coping skills is more likely to continue substance use brings to mind Robbins and Joseph's (1985) explanation of exercise in terms of the distraction hypothesis where an individual exercises for stress reduction or as a means of coping (see 2.7.2.). It is suggested by McMurrin (1994) that people's coping skills are likely to be

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<sup>3</sup> It has been suggested by Holloway, Beuter and Duda (1988) that increases in self-efficacy generalised to higher confidence levels about their bodies and general self-esteem (cited in Feltz, 1992). It appears that self-efficacy beliefs are a component of, and have an influence on general self-esteem.

affected by their sense of self-efficacy. She asserts that an individual's choice of coping behaviours and the degree of persistence in their execution depends on the level of confidence a person has in his or her ability to cope without the substance or activity. She continues by stating that individuals vary in their problem-solving abilities and cites research by Cynn (1992, cited in *ibid.*) who found that alcohol-dependent subjects were less motivated to engage in problem-solving tasks than her controls, despite their problem-solving abilities being intact. It seems that people who have a low sense of self-efficacy have little confidence in their ability to change their behaviour into activities which are more adaptive. Despite being aware of what should be done, they do not feel motivated to do it.

McMurrin (*ibid.*) notes that circumstances vary from one person to the next and that as time goes by biological, psychological and social factors change and so do the reasons for substance use. In accordance with social learning theory, approaches to change include assisting the individual in recognising the risk factors that precipitate substance use, improving alternative coping skills and enhancing the person's self-efficacy beliefs so the alternative skills can be used effectively.

### **3.5. EMPIRICAL MEASUREMENT OF SELF-EFFICACY:**

Albeit the definition of self-efficacy is clear, uncertainty about its measurement is evident (Morris, 1995b). Bandura (1977), proposes that self-efficacy should be measured in a microanalytic manner by assessing efficacy along three dimensions: level, strength and generality.

**3.5.1. *Level of Self-Efficacy*** measures the number of tasks or subskills of the total behaviour that the individual believes s/he can perform. For example, a self-efficacy questionnaire may ask whether or not a person believes s/he is able to walk one kilometre per week, two kilometres twice a week, five kilometres twice a week and ten kilometres twice a week (Morris, 1995b). This portrays four successive levels of self-efficacy for walking. In accordance with Bandura (1986, cited in *ibid.*), the individual answers 'yes' or 'no' depending on whether or not they believe they are able to attain each level.

**3.5.2. *Strength of Self-Efficacy*** reflects the way in which an individual's confidence varies for different levels which s/he expresses the capability to perform. It examines the certainty with which the individual expects to successfully attain each component task or level (Morris, 1995b; McAuley, 1992). Usually, it is assessed on a scale from 10 to 100 with 10-point intervals.

McAuley (1992) indicates that "overall strength of self-efficacy is determined by summing the confidence of rating and dividing by the total number of items comprising the target behaviour (p.109).

**3.5.3. *Generality of Self-Efficacy*** is a measure of the number of domains in which individuals consider themselves to be able to successfully perform in. This is in contrast to level and strength which are task- or behaviour-specific. Although this is a more recent concept which has received less support than other elements of self-efficacy theory, some literature supports the notion of generalisation of self-efficacy across sport (Brody, Hatfield & Spalding, 1988; Holloway, Beuter & Duda, 1988; McAuley, Courneya & Lettunich, 1991, cited in Morris, 1995b and McAuley, 1992). According to McAuley and Jacobson (1991, cited in Dishman, 1993), general feelings of physical ability might be a more useful predictor of overall exercise patterns across time, settings and activities than specific self-efficacy beliefs.

Despite Bandura's recommendations to measure self-efficacy using the microanalytic approach, Ryckman, Robbins, Thornton and Cantrell (1982) developed a global measure of physical self-confidence called the Physical Self-Efficacy Scale.

**3.5.4. *The Physical Self-Efficacy Scale*** is a 22-item scale which assesses two subscales, perceived physical ability (PPA) and physical self-presentation confidence (PSPC). Ryckman *et al.* (1982) assert that the development of this scale was an initial attempt to measure the *physical* aspect of self-efficacy independently. They base their reasons for creating such a scale on various theoretical underpinnings made by White (1959, cited in *ibid.*) and Piaget (1952, cited in *ibid.*) who claim that healthy development is, to a certain extent, based on an increasing sense of physical competence as the individual actively explores and masters his/her environment. Infants actively attempt to make changes to their environment, and as a result begin to develop a sense of physical self-efficacy. Furthermore they cite Allport (1955) who comments on the development of a bodily sense during infancy and Erikson (1963) who highlights the significance of infants actively exploring objects within their environments and the feedback from those around them in the development of physical competence (cited in *ibid.*).

It appears that Ryckman *et al.* (1982) view the physical self-efficacy scale as a trait measure which can be generalised across different sport settings. McAuley and Gill (1983, cited in Morris, 1995b; McAuley, 1991) have criticised this scale asserting that it has been shown to be a global measure which is less predictive of behaviour than task-specific measures. Despite this, various researchers

have utilised this scale in their studies (Gayton, Matthews & Burchstead, 1986; Cusumano, Robinson & Morooka, 1989; Ryckman & Hamel, 1993; LaGuardia & Labbé, 1993). McAuley (in press, cited in McAuley, 1992) notes that the perceived physical ability subscale has been shown to be predictive of measures of exercise intensity in adult exercisers and hence the physical self-efficacy scale has been employed for the purposes of this study. A number of reliability and validity studies have been undertaken, the results of which will be discussed in detail in chapter five.

According to Morris (1995b) there are ambiguities in the measurement techniques of self-efficacy as "reflected in the unorthodox manner of its use in some research on self-efficacy to date" (p.150.). McAuley (1992), indicates that to operationalise and measure self-efficacy and exercise behaviour adequately, one must employ strategies which consist of elements that sufficiently approximate the behaviour in question. He suggests that if intensity of activity, the convenience, time management and social or work obligations influence an individual's involvement in exercise, then they should be addressed. Furthermore, he indicates that an attritional approach to the construction of the measures should be employed in order to ascertain what aspects of exercise represent adoption, adherence and maintenance of activity (McAuley, 1990; Meichenbaum & Turk, 1987, cited in McAuley, 1992).

### **3.6. SUMMARY:**

Bandura's self-efficacy theory has become increasingly prominent in sport psychology with research findings indicating that self-efficacy beliefs and expectations may be a powerful mediator in exercise behaviour (Biddle & Fox, 1989). Self-efficacy is the belief one has in one's ability to perform a task and it is therefore conceptualised as a cognitive variable which mediates behaviour. It appears that self-efficacy is closely related to motivation with regard to choice, effort and persistence. Self-efficacy beliefs and addiction were discussed utilising social learning theory to illustrate the process by which less efficacious individuals are more likely to become addicted to a substance or activity. Whilst higher levels of physical self-efficacy may be present in those who engage in exercise, it seems that those who have the propensity to become addicted to such an activity, may suffer from a poor sense of physical self-efficacy. Consideration was given to the empirical measurement of self-efficacy, with reference to Bandura's microanalytic approach being explained and the physical self-efficacy scale being presented. Although self-efficacy theory, to some extent, delineates a relationship between self-efficacy and exercise adoption and maintenance, the focus appears to be restricted to performance-related matters. It therefore seems, in accordance with Morris (1995), that a closer look at psychological factors such as personality and theories of the self may assist in the explication of exercise adoption and addiction.

## **CHAPTER FOUR**

### **NARCISSISM**

#### **4.1. INTRODUCTION:**

The concept of narcissism is vast and complex and has been cited by a number of authors (Sachs, 1981; Deutsch, 1926 cited in De la Torre, 1995; Dervin, 1991) as being a possible player in the exercise arena. So too, have the relationships between narcissism and addiction (Johnson, 1993; Doweiko, 1993 and Kohut, 1995) and narcissism and self-esteem been described. As exercise addiction, and its relationship to the concepts of physical self-efficacy and narcissism, is the primary focus of this study, what follows is a psychoanalytic understanding of the term 'narcissism' and how it is related to self-esteem and addiction. The empirical measurement of narcissism is also discussed. It should be noted that for the purposes of this study which involves a non-clinical population sample, the construct of narcissism is viewed in terms of normal development. It is observed as a personality characteristic or disposition, rather than a form of psychopathology.

#### **4.2. THE MYTH OF NARCISSUS:**

The term narcissism is derived from the Greek myth of Narcissus. Narcissus was a beautiful, young man who was loved a great deal by the nymphs, including Echo, whom he rejected. As punishment for his callousness in refusing Echo's love, Aphrodite condemned him to fall in love with his own image as reflected in a mountain pool. He was forced to gaze constantly at his reflection. Each time Narcissus reached out to embrace the mirror image, it fragmented, causing him to pine away in despair and ultimately to die. Out of pity for Narcissus, the gods changed him into a lovely flowering plant, which bent its head over the water where his body had once been (Morrison, 1986).

Although interpretations of the myth vary, the common understanding of the term 'narcissism' incorporates extreme self-adoration accompanied by an aloofness that denies the need for another person (Schwartz-Salant, 1982). Nurnberg (1979, cited in Cooper, 1986) asserts that many features of narcissism are present in the myth: arrogance, self-centredness, grandiosity, lack of sympathy or empathy, uncertain body image, poorly differentiated self and object boundaries, absence of enduring object ties and a lack of psychological substance.

### 4.3. A BRIEF HISTORY OF NARCISSISM:

According to Cooper (1986) few psychiatric concepts have undergone as many changes in meaning as that of narcissism. The common understanding as stated above merely touches the surface. Narcissism is a vast, complex phenomenon which is reflected by Pulver's (1986) opening statement in his paper *Narcissism: The Term and the Concept*: "In the voluminous literature on narcissism, there are probably only two facts upon which everyone agrees: first, that the concept of narcissism is one of the most important contributions of psychoanalysis; second, that it is one of the most confusing" (cited in Morrison, 1986, p.91).

The term 'narcissism' was introduced by Ellis in 1898 to refer to a sexual perversion where the individual treats his/her body as though it is a sexual object, but also to indicate a generalised expression of self-admiration (cited in Morrison, 1986). Early psychoanalytic thought used the term in a derogatory manner implying that the narcissist is not only self-involved but beyond reach (Schwartz-Salant, 1982), however between 1908 and 1914, Sadger, Rank and Freud began to conceptualise narcissism as a normal stage of development (Morrison, 1986). Freud's 1914 essay *On Narcissism: An Introduction* (Freud, 1986) is thought to have had a decisive influence on the further development of narcissism and psychoanalysis.

#### 4.3.1. Freud and Narcissism:

In his elaboration of the developmental aspects of narcissism Freud (1986) delineates two types of narcissism: primary and secondary narcissism. He postulated that *primary narcissism* was present at birth, viewing the neonate as completely narcissistic, with the entire libidinal investment being in the self with regard to their physiological needs and satisfaction. This self-investment is referred to as ego libido (Kaplan, Sadock & Grebb, 1994). Gradually, with the growing awareness of a separate person (the mothering figure) being responsible for the gratification of needs, the infantile's state of self-absorption changes. The libido withdraws from the self and is redirected toward the external object, known as object libido. Freud postulates that if the developing child experiences the relationship with the caretakers as rejecting or traumatic, the object libido will be withdrawn from the external object and be reinvested in the self. This regressive posture was called *secondary narcissism* (cited in *ibid.*). Freud utilised the term narcissism for a number of dimensions of human experience (*ibid.*). More specifically, he viewed the concept of narcissism synonymously with self-esteem which will be discussed later in this chapter.

During the 1950's and 1960's, primary and secondary narcissism, the role of object representation in maintaining self-esteem, narcissistic entitlement and the ego ideal were examined by contributors to metapsychology (Morrison, 1986). The birth of object relations theory then began to inform the investigation of narcissism with a number of theorists contributing, particularly Kernberg and Kohut, the latter of which will be discussed in more detail.

#### **4.3.2. Kohut and Narcissism:**

Kohut (1986) and Kohut and Wolf (1978) questioned the assumption that narcissism is fundamentally pathological. Kohut describes narcissism as an age-related, normal developmental need for self-cohesion through the availability of self-object functions which are optimally provided by empathically attuned parents (Grosch, 1994). Kohut's interest lay in the transformation of archaic/primary narcissism to mature, adaptive and culturally valuable forms. Most relevant for the purposes of this study is that Kohut suggests that narcissism forms a continuum with healthy narcissism on the one end which is naturally and continuously related to the immature grandiosity of pathological narcissism at the other end (cited in Watson, Little, Sawrie & Biderman, 1992).

According to Kohut, self-object functions refer to narcissism as maintaining, restoring and transforming the self experience (cited in Grosch, 1994). A self-object is an intrapsychic experience of images which serve to uphold one's sense of self. In other words, it is not really a self or an object but the subjective aspect which is supportive of the self. The presence or activity of an object which is often another person, an idea, nature or music (or possibly exercise) can sustain a person's sense of self (*ibid*). The infant relates to others in a narcissistic manner when s/he "...experiences other people from a position of normal healthy self-interest, based on the need to grow and expand, perhaps to maintain a basic security..." (*ibid.*, p.50). Kohut (cited in *ibid.*) asserts that for as long as a person lives, the self-evoking and self-maintaining selfobject function is needed. However, where the adult utilises more symbolic selfobject experiences, the child will use the more concrete selfobject.

According to Grosch (1994), Kohut believes that the self is pushed by ambitions (i.e. inborn talents) and pulled by its ideals (a set of values from an omnipotent parent). If the ambitions are adequately validated and recognised, the self is pushed to develop skill from which pride and enthusiasm develop. The ideals from the idealised parent are outside the self and usually pull the child up to the ideal. If the child receives adequate mirroring from the caretaker, s/he will develop healthy assertiveness, initiative and ambition. If there are sufficient successful idealisations, values, goals and ideals develop. The ideals act as guides rather than controls and may be transformed into



forms such as creativity, empathy, acceptance of mortality, humour and wisdom. It is possible that the ideals of an addicted exerciser serve to control rather than guide the individual.

Unlike Kernberg (1986a, 1986b) who views the grandiose self as a pathological construct, Kohut (1995, 1986) views it as a normal part of the child's narcissistic development. If parents or caretakers do not provide sufficient acceptance, affirmation and admiration of the self in its uniqueness, immature narcissism will be buried in an unmodified form. The occasional failure of adequate mirroring, however, forces the child to develop his or her own inner resources resulting in increasing self-reliance (Grosch, 1994). Along this line ambitions become more realistic and goal orientations are modified by limits of reality.

Kohut explains that when these empathic failures are excessive or traumatic and the child is cut off from narcissistic supplies, then the self is unable to transform from childish grandiosity to reliable self-esteem. Based on this failure of the archaic narcissism to be transformed into a more mature form, a narcissistic disturbance develops and a pathological grandiosity is perpetuated where any threat to self becomes a threat to one's very existence (*ibid.*). The relationship between narcissism and self-esteem is of particular interest for this study considering it explores one aspect of self-esteem, that of physical self-efficacy.

#### 4.4. NARCISSISM AND SELF-ESTEEM:

Freud (1914) began to use the term narcissism to mean self-esteem when he wrote "We must recognise that self-regard has a specially intimate dependence on narcissistic libido" (cited in Jacoby, 1990, p.81). He proposes three determinants of self-regard: (i) love for oneself, (ii) being loved by others and (iii) success at achieving the ambitions and goals the ego idea sets for oneself (*ibid.*). His equation of self-esteem and narcissism was a specific referral to secondary as opposed to primary narcissism. As described above, secondary narcissism means that the child has already attained the capacity to cathect the libido and object (mother), however s/he withdraws the libido as a defensive manoeuvre against the displeasure, anxiety and other painful affects provoked by the original cathexis (Pulver, 1986). The importance of the people around the child is devalued while the value of its own person is inflated. The inflated self-esteem therefore becomes a defence against the vulnerability and helplessness felt in the face of frustrating parental figures. Pulver (1986) criticises the utilisation of the term narcissism to mean self-esteem in that a theoretic drive concept is identified with a complex phenomenon of self-esteem which is made up of multiple factors. Albeit inadequate to use the terms interchangeably, Schwartz-Salant (1982) asserts that clinical experience with narcissistic character disorders reveals that the person's major complaint

is a lack of identity and self-esteem and hence the relationship between self-esteem and narcissism cannot be ignored.

Pulver (1986) distinguishes between good/healthy narcissism and bad/unhealthy narcissism in relation to self-esteem. The former is a "...high self-esteem based on predominantly pleasurable affect-self representation linkages" (p.105) while the latter is an apparent high regard for oneself or self-centredness which is used as a "...defence against underlying unpleasurable linkages" (*ibid.*).

For the self psychologists (Kohut being one of them) narcissistic object relations are central in the establishment and maintenance of a cohesive sense of self, characterised by an ongoing sense of positive self-regard and self-esteem (Sacksteder, 1990). As mentioned above, grandiosity matures into healthy self-esteem (Watson, Little, Sawrie & Biderman, 1992). Jung (1928, cited in Jacoby, 1990) talks about the grandiose self craving admiration - in terms of the theories of narcissism - 'narcissistic gratification'. Followers are needed in order to protect against self-doubts and prove value. Raskin, Novacek and Hogan (1991) suggest that narcissism and the need for approval are primary strategies for regulating self-esteem. According to the American Psychiatric Association narcissism is conceptualised "as a pattern of grandiosity used to bolster and enhance a fragile sense of self-esteem" (cited in *ibid.*, p.19). The narcissist is viewed as having constructed over-idealised or unrealistically high self-perceptions and is not able to easily tolerate a discrepancy between their desired selves and actual selves (Davis *et al.*, 1996). This may be a possible explanation for the addicted exercisers who despite their past achievements, continually set higher goals (possibly unrealistic goals) for themselves and increase the frequency and intensity of their exercise behaviour in order to achieve those goals.

#### 4.5. NARCISSISM AND EXERCISE:

##### *On First Avenue*

*"He uses superballs for squash and takes Linus Pauling's Vitamin C's. He carries a capsule of Humphrey Bogart in his pocket and brings it out at night when his lover comes to wash his dishes. ...he belongs to nobody. He spends his days running in Central Park" (Robert Hass, cited in Sours, 1982, p.80).*

According to De la Torre (1995), the past two decades has seen a rapid increase in concern with health, particularly the prevention of disease. He posits that gradually this attention to health has given way to a preoccupation with "outstanding body functioning and how it manifests in physical

appearance, until it has virtually attained the status of a contemporary secular religion" (p.15). Similarly, Lasch (1979) argues that because we have lost a sense of historical and religious continuity, the Western society has developed a profound self-absorption, a 'collective narcissism', a 'me' generation. Advances in technology have allowed for the media, with its 'cult of celebrity' to fuel our narcissistic dreams of glory and fame making it increasingly difficult for society to accept the banality of everyday existence (*ibid.*). With regard to running, Sours (1981) attributes the increase in the popularity of running in the United States to the self-centred mood of the nation and the overt narcissistic attitudes that permeate and provide a life-style for Western culture.

Albeit that there is a sociological explanation for the relationship between narcissism and exercise, an individual explanation is also considered. Miller (1992) emphasises the distinction between healthy and pathological narcissism. He views pathological narcissism as the combination of three dynamic factors; (i) a marked deficit in self-esteem, (ii) a strong effort to compensate for this by embarking on self-affirming behaviours and attitudes which have been successful in the past and (iii) excessive usage of sources of self-affirmation that minimise interpersonal risk. He goes on to explain that there are a number of self-affirming activities available which range from those that are self-contained, risking little interpersonal vulnerability and those that risk a great deal of interpersonal vulnerability. Examples of the former are activities which provide the individual with a sense of physical fitness and good health such as correct diet and regular exercise. Because these behaviours do not involve interpersonal interaction, he believes that the narcissist is likely to overuse such activities, sometimes to a maladaptive extent, in order to regulate self-esteem.

One study (Jackson, Ervin & Hodge, cited in Davis *et al.*, 1996) confirms this view with results that suggest that those high in narcissism also tend to engage in more fitness and appearance related activities. Although Davis *et al.* (1996) failed to prove a significant difference in narcissism between exercisers and non-exercisers, the exercisers obtained higher scores on the Narcissistic Personality Inventory. This is of significance to this study in that one would expect regular runners and aerobics exercisers, particularly the addicted exercisers, to have higher narcissistic tendencies than the non-exercisers.

#### 4.6. NARCISSISM AND ADDICTION:

*"It is the lack of self-esteem of the unmirrored self, the uncertainty of the self, the dreadful feeling of the fragmentation of the self that the addict tries to counteract by his addictive behaviour"* (Kohut, 1977, cited in Van Schoor, 1992, p.208).

Kohut (1971, 1977, cited in *ibid.*) conceptualised narcissistic disturbances to be central to the psychopathology of addiction. If the child consistently experiences disappointment or distress during his/her development, s/he lacks the internal psychological structure which enables self-regulation of tension, self-soothing and self-esteem. The child therefore responds by looking for something or someone else in order to activate self-object experiences that affirm self-cohesion and vitality, reduce tension and regulate self-esteem, regardless of how destructive or self-defeating (Van Schoor, 1992; Grosch, 1994). According to Grosch (1994), three conditions may be responsible for individuals to discover that they are able to experience and seek vitality and cohesions from maladaptive, perverse or pathologic sources.

Firstly, consistent experience of trauma or abuse may have an organising effect on self-cohesion. For example, where physical pain has been recurrent, it may create a more cohesive experience than comfort and where humiliation or guilt have been recurrent, these affects may convey more intensity in an intimate relationship than respect. The second source of pathological self-object experience may be a result of objects that serve as a means of comfort to a wide range of discomforts. The activities, objects or substances become substitutes for the normal prototypes i.e. the mother's hand to hold, or the transitional object. They provide relief for present or potential distress and discomforts. The third source of self-object experiences relates to the ideation which is associated with experiences that provide a powerful boost to vitality and cohesion of the self. Grandiosity is frequently observed in the addict and manifests itself in the form of arrogance and unrealistic goals, feelings of entitlement, the need for omnipotent control, lack of differentiation between self and other and deficits in self-regulating activities (Levin, 1987, cited in Van Schoor, 1992). The grandiosity or precocious 'false self' coexists with low self-esteem and creates an illusion of self-sufficiency (Modell, 1975).

Addiction can become all-consuming, affecting both body and mind. Without the addiction the addict is left with an empty self which is associated with painful affects (Van Schoor, 1992). "Without running life has no meaning, no purpose, no way to supremacy" (cited in Sours, 1981, p.88). Again, this brings to mind Robbins and Joseph's (1985) theory that exercisers adopt a strict exercise regime in order to cope with stress. Furthermore, serious runners have been described

as those who "search for perfection, try to project a physical self which fulfils an ego-ideal... If runners can maintain a sense of being special, they have a secret to support them in societal isolation" (Sours, 1981, p.88). It seems that this reflects the essence of narcissism - a yearning for absolute uniqueness, to be the sole object of importance to someone else (Morrison, 1986). Sours (1981) continues by asserting that narcissistic restoration efforts at correcting defects, which occurred early in the formation of the self, are maladaptive.

#### 4.7. EMPIRICAL MEASUREMENT OF NARCISSISM:

After Kohut and Kernberg's contributions to the concept of narcissism, clinical interest increased to the extent that the American Psychiatric Association (APA) included it in the *Diagnostic and Statistical Manual of Mental Disorders (DSM-III)* in 1980 (Raskin & Terry, 1988). The diagnostic criteria for the narcissistic personality disorder includes a grandiose sense of self-importance; preoccupation with fantasies of unlimited success, power, brilliance, beauty or ideal love; exhibitionism; cool indifference or rage, inferiority, shame and emptiness; entitlement, exploitativeness; overridealisation or devaluation; and a lack of empathy. Interestingly, Millon and Everly's (1985) theory regarding this personality configuration differs somewhat from Freud, Kernberg and Kohut. They propose that the infant is consistently showered with parental overvaluation which results in the child developing an unrealistic sense of self-worth. If this grandiose self-image is not confirmed by later life experiences, the narcissist will resort to fantasy in order to provide comfort and consolation. These observations appear to have been validated by contemporary research (Raskin & Novacek, 1991; Raskin, Novacek & Hogan, 1991). Albeit that the *DSM-III* has undergone two subsequent revisions (*DSM-III-R*, APA, 1987; *DSM-IV*, APA, 1994), the changes to the diagnostic criteria for the narcissistic personality disorder are negligible and, in accordance with Labuschagne (1996), the three versions are viewed as essentially interchangeable.

According to Raskin and Terry (1988), 70 years of clinical observation of the narcissistic phenomena has yielded a relatively distinct picture as depicted above. Despite this, there appears to be a paucity in literature concerning the empirical development of the narcissism construct. Raskin and Terry (*ibid.*) offer a comprehensive review of measures which have been developed in order to measure narcissism together with their shortcomings. They assert that narcissism includes a vast range of diverse, yet interdependent mental processes and behavioural phenomena and tests, which yield a single score for narcissism, lose sight of the complexities inherent in the construct. They suggest that in order for a measurement of narcissism to be adequate, it must reflect its multidimensionality. Another criticism of these efforts is that the instruments ignore the evaluation

of behaviours which can substitute for, and mask, pathological narcissism such as depression, sexual acting out, chemical abuse, eating disorders or criminality (Gottschalk, 1988, cited in Labuschagne, 1996; Miller, 1992).

Raskin and Hall developed the Narcissistic Personality Inventory (NPI) in 1979, and of all the measures of narcissism, it has received the most empirical attention to date (Raskin & Terry, 1988). Due to the fact that the NPI utilises a developmental, as opposed to a pathological approach to narcissism, it was employed for the purposes of this study and therefore receives more detailed attention below and in chapter five.

#### **4.7.1. The Narcissistic Personality Inventory (NPI):**

The Narcissistic Personality Inventory (Raskin & Hall, 1979; Raskin & Terry, 1988) was considered to be particularly useful for the present study as it was created as a measure of individual differences in narcissism in non-clinical populations. If, as the theories suggest, narcissism emerges within the context of normal development (Freud, 1986; Kohut, 1995, 1986), the study of non-clinical populations may be a valuable means of obtaining information about the behaviour. Furthermore, if healthy, adaptive narcissism and unhealthy, maladaptive narcissism is viewed on a continuum, then it appears that maladaptive narcissism will be apparent to a more or lesser degree within the non-clinical population (Raskin & Hall, 1981). Lastly, Lasch's (1979) claim that the Western culture is infiltrated by narcissistic interpersonal styles, indicates that this concept should be evident in members of the general population.

The NPI is based on the *DSM-III* (APA, 1980) diagnostic criteria, and relies heavily on the theoretical work of Kohut and his concept of healthy narcissism (1971, 1977) and Kernberg (1970, 1975), in order to inform their research in this area (cited in Goldstein, 1985). In acknowledgement of the complexity of the concept of narcissism, Raskin and Terry (1988) refined and revised the original questionnaire (Raskin & Hall, 1979) by reducing the number of test items and by incorporating seven interdependent subscales of narcissism into the inventory. The dimensions measured by the subscales are discussed below:

**4.7.1.1. Authority:** This measure is based on the grandiose self which compensates for feelings of vulnerability and shame (Kohut, 1995; 1986). Intimate, interpersonal relationships contain a risk of presenting as vulnerable, hence the need for power and control in interpersonal associations (Miller, 1992). The grandiose, dominant and assertive self is used to manage hostility around this threat and regulate a fragile self-esteem (Raskin & Novacek, 1989).

**4.7.1.2. Exhibitionism:** Kohut and Wolf (1978) posit that a highly labile self-esteem will result in the narcissistic character being extremely sensitive to slights, rejections and perceived failure. The uncomfortable feelings created by perceived failure may result in dangerous acting-out and sensation-seeking behaviour (Goldstein, 1985; Svrakic, 1985, cited in Labuschagne, 1996).

**4.7.1.3. Exploitativeness:** As a means of maintaining the grandiose self, the narcissist requires an enormous amount of praise and acknowledgement. Others are perceived to be sources of such gratification and not as people with feelings and needs of their own (Goldstein, 1985). The lack of understanding others' emotions (i.e. a failure in empathy) may result in overtly antisocial acts such as lying and stealing in order to get what is needed from others (cited in Labuschagne, 1996).

**4.7.1.4. Self-Sufficiency:** Modell (1975) conceptualises self-sufficiency as a narcissistic defense against dependency on external sources of affirmation. For the narcissist, dependency invokes feelings of invulnerability and therefore a precocious sense of self is developed which denies the need for interpersonal relationships. As described previously, Miller (1992) asserts that the narcissist gains self-affirmation from activities with little risk of interpersonal vulnerability. Examples of such activities are: chemical substance abuse; food; extreme exercise programmes; hypochondriasis; obsessions with possessions or status; excessive control or influence over others; resources or information; inordinate devotion to self-instruction; adherence to rigid idealised values incongruent with those of society and obsessions in the quest for a perfect mate.

**4.7.1.5. Entitlement:** Arlow and Brenner (1964), Murray (1964), Kernberg (1970) and Oremland and Windholz (1971) all note that unlimited entitlement is an attempt to repair injuries to and degradations of the self-representation (cited in Stolorow, 1986). It is conceptualised as maintaining the grandiose self (Raskin & Novacek, 1991) and behaviour may be tailored to ensure that this need is met.

**4.7.1.6. Superiority:** Pulver's (1986) description of bad narcissism involves the narcissist portraying a sense of self-centredness and high regard as a means of defending against unpleasant evaluation. There is a strong need to obtain positive interpersonal feedback in order for the narcissist to inflate the ego and regulate self-esteem (Horner, 1994, cited in Labuschagne, 1996). If negative feedback is directed toward the narcissist, s/he will consider the evaluator to be less competent and likeable and in effect will externalise blame (Kernis & Sun, 1994, cited in *ibid.*).

**4.7.1.7. Vanity:** In order to preserve grandiose self-representations and illusions of perfection, activities such as extreme forms of exercise or diet may be undertaken in order to maintain physical beauty (Miller, 1992). According to De la Torre (1995) exercise abusers will reconfirm their physical perfection daily through their athletic performances. As stated by Labuschagne (1996), situations will constantly be manipulated in order to ensure that the narcissist receives the constant affirmation s/he craves and if reality, in any way, contradicts the fantasy of perfection, the narcissist swiftly withdraws from and ignores reality (De la Torre, 1995). De la Torre (*ibid.*) posits that aerobics exercisers gain enormous self-confirmation from careful scrutiny in the gym mirror, which he asserts, is more important than another person's admiration. To encapsulate this he describes a patient who walks into an empty aerobic exercise studio with mirrors on all four walls and thinks "I love to see me in a sea of me's" (*ibid.*, p.27).

According to Raskin and Novacek (1989), the NPI Authority, Self-Sufficiency, Superiority and Vanity components reflect the least potential for serious psychological maladjustment. The Exploitativeness, Entitlement and Exhibitionism components are regarded as having considerable potential for psychological maladjustment.

#### **4.8. SUMMARY:**

Despite many different theorists contributing to the concept of narcissism, the work of Freud and Kohut has been discussed in this chapter. Of relevance to this study is that Kohut (1995), delineates a theory of normal narcissistic development and attributes narcissistic personality disorders to traumatic events occurring during the course of development of the grandiose-self. Narcissism is viewed as an essential factor in self-esteem regulation and the relationship between these two concepts is discussed. Furthermore, the role of narcissism in the development of an addiction as a means of regulating self-esteem is explored, and related to exercise addiction. A brief introduction regarding the empirical measurement of narcissism is offered with the Narcissistic Personality Inventory receiving detailed attention.



## **CHAPTER FIVE**

### **RESEARCH METHODOLOGY**

#### **5.1. INTRODUCTION:**

The following chapter contains information regarding the type of research and sampling procedures utilised in this study in order to explore the constructs of narcissism and physical self-efficacy in exercisers and their relationship to exercise addiction. General information and the psychometric properties regarding the instruments used to measure such constructs, together with the statistical procedures employed are also discussed.

Please note, despite the printout of all results utilising four or five decimal places, the results in this text will be confined to two or three decimal places only. Furthermore, as a result of missing values in some questionnaires, a number of protocols were not considered for statistical analyses. Hence, the varying sample numbers which are reflected in the reliability analyses for the present study.

#### **5.2. RESEARCH DESIGN:**

For reasons of practicality non-experimental, specifically survey, research was utilised. According to Kerlinger (1986), there are three important weaknesses inherent in non-experimental research as follows:

- (i) the inability to manipulate independent variables
- (ii) the lack of power to ensure random sampling
- (iii) the risk of improper interpretation

The sample for the research was obtained via convenience/non-probability sampling methods. It should be pointed out that response bias becomes a concern with a convenience sample (Babbie & Wagenaar, 1992). This type of sampling does not allow for a statistical evaluation of sampling error (Diamantopoulos & Schlegelmilch, 1997) and consequently, generalisations may be more or less valid depending on the homogeneity of the population. Hence interpretations of results need to be made with caution as the significant associations may be associated with unknown extraneous variables.

In order to overcome this difficulty, various demographic information is required to enhance the researcher's understanding of the extraneous variables involved. Furthermore, according to Babbie

& Wagenaar (1992), a higher response rate reduces the risk of a significant response bias. Although not based on statistical analyses but on an overview of the survey research literature, certain rules of thumb about return rates are documented (Babbie & Wagenaar, 1992), where a response rate of at least 50 percent is considered *adequate*, 60 percent is *good* and 70 percent is *very good* for analysis and reporting.

### **5.3. THE SAMPLE AND PROCEDURE:**

The non-random sample consisted of three groups (n=211) of white, English speaking people. All subjects were 18 years old or over (mean = 36.6 years). Each subject received a questionnaire package consisting of an explanatory letter (Appendix 1.), relevant questionnaires (see 5.4.) and a self-addressed, stamped envelope. A brief description of the subjects and the various sampling procedures which were undertaken follows:

#### **5.3.1. Group One - Runners:**

Group one consisted of 112 runners (71 male, 41 female) whose ages ranged from 19 - 60 years (mean = 39.5 years). The selection criteria used for this group stipulated that the subject must have completed at least one half or standard marathon. A response rate of 66% was obtained from this group.

The majority of the sample was obtained from two Gauteng-based running clubs: Rand Athletic Club and Randburg Harriers. The initial approach was made telephonically to the chairman and secretary of the two clubs, both which responded with keen and helpful interest. Appointments coinciding with the clubs' regular running evenings were set up to access the runners. Before the runners embarked on their run, a personal introduction of the researcher and the study were made as part of the allocated time for general announcements. Thereafter, the names and telephone numbers were noted of those willing to participate in the study and questionnaire packages distributed. Telephonic reminders were given to all subjects. Those who did not return their questionnaires by post, brought them to their next running meeting where the researcher collected them.

A number of questionnaire packages (n=50) were distributed to four physiotherapists and two acquaintances who circulated them to appropriate runners. This group of subjects returned their questionnaires by post.

### **5.3.2. Group Two - Aerobics Exercisers:**

Group two consisted of 57 aerobics exercisers (19 male, 38 female) whose ages ranged from 19 - 57 years (mean = 34.2 years). Any person who attended aerobics classes on a regular basis (i.e. 3-5 times per week) was appropriate for this group. A response rate of 50% was obtained from this group.

The majority of the sample was obtained from a Gauteng gym: the Sandton Health and Racquet Club, with a number of questionnaires (n=20) being distributed to physiotherapists and acquaintances. The researcher met with the club's aerobics manager in order to obtain permission to access subjects before they began an aerobics class. Once this was granted, by both the manager and the aerobics instructor's, the class participants were introduced to the researcher and the study and it was requested that those interested collect a questionnaire package from the researcher after the class had been completed. Again, the names and telephone numbers of interested subjects were noted and telephonic reminders were made. Those who did not return their questionnaires by post, dropped them off in a clearly marked box at the club's reception desk. The researcher periodically collected these from the club.

### **5.3.3. Group Three - Non-exercisers:**

Group three consisted of 42 non-exercisers (12 male, 30 female) whose ages ranged from 20-61 years (mean = 32.2 years). The subjects were selected on the basis that the individual had not consistently (i.e. 3 times per week) engaged in any vigorous, physical, aerobic activity for a period of at least 6 months.

Questionnaire packages were distributed to known non-exercisers who further handed questionnaires to various eligible subjects in their place of employment. A response rate of 70% was obtained for this group.

A total response rate of 61% was obtained for all three groups, which according to Babbie & Wagenaar (1992), would be considered good for survey research in terms of reducing the risk of a significant response bias (see 5.2.).

#### 5.4. PSYCHOMETRIC INSTRUMENTS:

A battery of psychometric instruments to quantitatively assess the different research variables was compiled. A biographical questionnaire for each group was compiled by the present author. Exercise addiction was measured using the Negative Addiction Scale (NAS) designed by Hailey and Bailey (1982). An objective measure of physical self-efficacy was obtained through the use of the Physical Self-Efficacy (PSE) Scale developed by Ryckman, Robbins, Thornton and Cantrell (1982). The Narcissistic Personality Inventory (NPI) (Raskin & Terry, 1988) was used to measure narcissistic traits. A composite scale comprising various items of the biographical questionnaires for the runners and aerobics exercisers was utilised as a measure for exercise commitment.

Each subject completed a biographical questionnaire relevant to their group assignment, the PSE Scale and the NPI. Groups one and two further completed the NAS which was titled the Running Scale and Aerobics Scale respectively. Both the latter contained the same items, however the wording for the Aerobics scale was slightly modified to pertain specifically to aerobics.

**Table 5.1: Measures Completed by the three groups.**

<b>GROUP ONE (Runners)</b>	<b>GROUP TWO (Aerobics Exercisers)</b>	<b>GROUP THREE (Non-Exercisers)</b>
1. Biographical Information	1. Biographical Information	1. Biographical Information
2. Physical Self-Efficacy Scale	2. Physical Self-Efficacy Scale	2. Physical Self-Efficacy Scale
3. Narcissistic Personality Inventory	3. Narcissistic Personality Inventory	3. Narcissistic Personality Inventory
4. Negative Addiction Scale (Running Scale)	4. Negative Addiction Scale (Aerobics Scale)	

##### 5.4.1. Biographical Information:

The test battery was introduced by a biographical questionnaire relevant to each group (Appendices 2., 3. & 4.). It was requested of each subject to fill out his/her name and a contact telephone number solely for follow-up purposes in the case of missing data. This, however, was not obligatory but rather optional. All three variations of the biographical questionnaire enquired about age, sex, occupation, marital status, history of eating disorders and exercise importance.

The Non-Exercising group were further asked to comment on reasons for not exercising, whilst groups one and two answered questions relating to the various exercises they engaged in and the intensity. Furthermore, the biographical questionnaires for these two groups made a more specific enquiry with regard to the subject's running or aerobic behaviour. This enquiry included questions

regarding the duration of the exercise, the intensity, the number of marathons or aerobics competitions entered, the best time or position obtained, performance prediction, motives for engaging in this particular exercise, team selections and estimates of fitness levels in specific areas.

#### **5.4.2. Physical Self-Efficacy (PSE) Scale:**

Physical self-efficacy, the aspect of self-efficacy which is considered important with regard to sport performance, was measured by the PSE Scale (Ryckman *et al.*, 1982) (see Appendix 5). The scale was developed in an attempt to construct a direct measure of individual's perceived physical self-confidence (McAuley, 1992). The scale consists of 22, 6-point Likert items, each with response alternatives ranging from strongly agree to strongly disagree (Ryckman *et al.*, 1982). Items measure perceived physical abilities such as speed, strength, reaction time, etc. (McAuley, 1992). Within a global measure of physical self-efficacy a factor analysis of 90 items identified the 22 items for two subscales as follows:

**5.4.2.1. Perceived Physical Ability (PPA) Subscale:** This subscale measures an individuals' expectancies with regard to his/her perceived physical competence in performing certain tasks involving physical skills. It consists of 10 of the 22 items with a possible range of 10 to 60. Higher scores on this scale indicate higher perceived physical ability. Items included in this subscale are as follows: 1, 2, 4, 6, 8, 12, 13, 19, 21 and 22.

and

**5.4.2.2. Physical Self-Presentation Confidence (PSPC):** The individuals' feelings of confidence to display these skills in the presence of and have them evaluated by others is measured by this subscale. It consists of the remaining 12 items with a range from 12 to 72. Higher scores on this scale reflect greater confidence in the presentation of physical skills. Items included are 3, 5, 7, 9, 10, 11, 14, 15, 16, 17, 18 and 20 (Ryckman *et al.*, 1982).

Although the two scales are fairly independent, they are somewhat related ( $r = 0.26, p < 0.05$ ) (Ryckman *et al.*, 1982) and therefore can be added to yield a total **Physical Self-Efficacy (PSE)** score with a possible range of 22 to 132. A higher PSE score indicates a stronger sense of physical self-efficacy.

#### 5.4.2.3. Reliability:

Based on two samples of university students, Ryckman *et al.* (1982) report Cronbach alpha for internal consistencies of both subscales and the composite PSE scale as follows:

**Table 5.2.: Cronbach alpha coefficients as obtained by Ryckman *et al.* (1982) and the present study.**

SCALE	RYCKMAN <i>et al.</i> (1982)		PRESENT STUDY
	<i>n</i> = 363	<i>n</i> = 83	<i>n</i> = 192
Perceived Physical Ability (PPA)	.84	.85	.79
Physical Self-Presentation Confidence (PSPC)	.74	.75	.63
Physical Self-Efficacy (PSE)	.81	.82	.76

Bearing in mind that a coefficient of 0.7 and above is considered adequate for inter-item reliability, the cronbach alpha obtained by the present study for the PSPC subscale (0.63) is slightly lower than would be ideal. However, the inter-item reliability results reveal no negative correlations or any specific item as being particularly problematic. Rather all alpha coefficients for each item if it was to be deleted, range from (0.59 to 0.63).

Test-retest reliabilities based on the sample of 83 students were as follows ( $p = < .001$ ): 0.85 (PPA), 0.69 (PSPC) and 0.80 (PSE) (Ryckman *et al.*, 1982).

#### 5.4.2.4. Validity:

Ryckman *et al.* (1982) mention three different validity studies which support the overall scale's convergent, concurrent and predictive validity. Furthermore, the two subscales are reported to have adequate discriminant and concurrent validity. The many correlations recounted range from  $r = -0.13$  ( $p < 0.05$ ) to  $r = -0.45$  ( $p < .001$ ) (Ryckman *et al.*, 1982). The results suggest that individuals who perceived themselves to have excellent physical skills had a higher self-esteem, an internal locus of control, a lack of social anxiety and self-consciousness and a tendency to engage in more adventurous physical activities and disinhibiting sexual experiences. Furthermore, it was found that subjects with a more positive perception of their physical competence were able to out-perform the subjects who had a poorer self-regard on three different tasks involving the use of physical skills.

According to McAuley (1992), the Physical Self-Efficacy Scale as a global measure is less predictive of skilled performance than task-specific measures. Although Bandura (1986, cited in

*ibid.*) asserts that task-specific or particularised measures of self-efficacy offer more explanatory power and are more predictive of behaviour than generalised measures, McCauley (1992) indicates that the perceived physical ability subscale is predictive of measures of exercise intensity in beginner adult exercisers. Means and standard deviations for each scale are reported in chapter six.

### **5.4.3. Narcissistic Personality Inventory (NPI):**

Raskin and Hall's (1979) 40-item Narcissistic Personality Inventory (NPI) was used to measure individual differences in narcissistic personality traits (see Appendix 6.). It is a forced, dyadic-choice questionnaire which was originally developed for non-clinical populations and normed on 1018 American undergraduate college students (Raskin & Terry, 1988). Although a number of scales have been developed to assess narcissism, the NPI appears to be the most commonly used, particularly in non-clinical research (Davis, Claridge & Brewer, 1996). The content of the items is based on the DSM-III (1980) diagnostic criteria for Narcissistic Personality Disorder (see Appendix 7.) and yields a total score as well as seven independent but correlated subscores as follows (Raskin & Terry, 1988):

**5.4.3.1. Authority:** This subscale is characterised by dominance, assertiveness, leadership, criticality and self-confidence and includes item numbers 1, 8, 10, 11, 12, 32, 33 and 36.

**5.4.3.2. Exhibitionism:** Sensation seeking, extraversion, exhibitionism and a lack of impulse control summarise the central characteristics of this component. Items included are 2, 3, 7, 20, 28, 30 and 38.

**5.4.3.3. Superiority:** Characteristics such as capacity for status, social presence, self-confidence and narcissistic ego-inflation are associated with this subscale. It includes item numbers 4, 9, 26, 37 and 40.

**5.4.3.4. Entitlement:** This NPI component is characterised by ambitiousness, need for power, dominance, hostility, toughness and a lack of self-control and tolerance for others and includes items 5, 14, 18, 24, 25 and 27.

**5.4.3.5. Exploitativeness:** Attributes such as rebelliousness, non-conformity, hostility and a lack of consideration and tolerance for others are associated with this subscale and the item numbers are 6, 13, 16, 23 and 35.

**5.4.3.6. Self-Sufficiency:** This subscale appears to be related to assertiveness, independence, self-confidence and a need for achievement. It includes items 17, 21, 22, 31, 34 and 39.

**5.4.3.7. Vanity:** Vanity seems to be defined by both regarding oneself as physically attractive and being actually judged to be physically attractive. The items included are 15, 19 and 29.

A score for each subscale is obtained by totalling the individual item numbers associated with that particular score, each being worth one point.

**5.4.3.8. Reliability:**

Various empirical studies of the NPI (Auerbach, 1984; Emmons, 1984; Watson, Grisham, Trotter & Biderman 1984) have demonstrated alpha reliability coefficients for the general construct of narcissism ranging from  $r = 0.80$  to  $r = 0.86$ . Raskin & Hall's (1979) alpha reliability coefficients, together with the present studies findings are as follows:

**Table 5.3.: Cronbach alpha coefficients as obtained by Raskin & Hall (1979) and the present study.**

SCALE	NO. OF ITEMS	RASKIN & HALL (1979) $n = 1018$	PRESENT STUDY $n = 191$
Authority	8	.73	.79
Exhibitionism	7	.63	.57
Superiority	5	.54	.59
Entitlement	6	.50	.53
Exploitativeness	5	.52	.53
Self-Sufficiency	6	.50	.53
Vanity	3	.64	.64
Total score	40	.83	.84

The scores yielded by Table 5.3. suggest that the Authority scale and the total score of the NPI are the two most reliable measures with the Vanity subscale nearing the 0.7 cut off point. Although the present study's alpha coefficients for the remaining subscales are not as reliable, they appear to be close to what Raskin & Hall (1979) report. These low coefficients may be a result of the small number of items included in these scales.



#### **5.4.3.9. Validity:**

Raskin and Terry (1988) conducted various validity studies in order to determine the NPI's capability of measuring the construct of narcissism with its multidimensionality inherent in the construct itself. A principal-components analysis yielded the seven independent yet correlated factors as described above, with the average intercomponent correlation being 0.27. Furthermore, each component scale showed a correlation of 0.25 and above with at least two other component scales. Component scale loadings on the first unrotated principal component ranged from 0.45 - 0.75 indicating that a general factor is reflected within the seven NPI subscale scores. According to Davis *et al.* (1996), certain authors have argued that certain NPI items measure the maladaptive aspects of narcissism and other the adaptive aspects (Raskin & Novacek, 1989), however there is good evidence that the subscales are correlated. They therefore conclude that both aspects of narcissism co-occur in most individuals.

Further studies in order to determine the scale's construct validity (Raskin and Terry, 1988) were undertaken. Correlations with various personality inventories yielded coefficients ranging from 0.17 to 0.67 indicating that the NPI appears to be consistent with the description of the narcissistic personality in DSM-III (1980).

Means and standard deviations for each scale are reported in chapter six.

#### **5.4.4. The Negative Addiction Scale (NAS):**

In order to measure a high or low tendency towards exercise addiction, Hailey and Bailey's (1982) Negative Addiction Scale was employed. Normed on 60 male runners, the scale was developed to measure the psychological aspects of negative addiction to running and to determine if the extent of addiction was related to length of running history (Hauck & Blumenthal, 1992). The 14-item scale explores not only mental states during days with or without running but also perceptions about running, the importance of running for the individual, motives for running and running strategies (Thornton & Scott, 1995). The first twelve five-choice items assess general psychological characteristics of running whilst the thirteenth question (an 11-point checklist) evaluates running behaviour more specifically. Although the items in the scale do not relate exclusively to either the positive affective states resulting from running or the negative consequences of withdrawal, they reflect an attitude of compulsive commitment to running (*ibid.*).

The NAS yields one addiction score ranging from 0 (low) to 14 (high). Hailey and Bailey (1982) found that although the maximum score is 14 the runners in their study had a mean addiction score

ranging from 3.84 ( $SD = 1.95$ ) to 6.38 ( $SD = 2.61$ ) while Furst and Germone (1993) found their runners had a mean addiction score ranging from 2.0 ( $SD = 1.6$ ) to 5.3 ( $SD = 2.4$ ). No research appears to have been undertaken in order to determine the point on the scale at which a person would be considered addicted to exercise. Furthermore it does not indicate relative amounts of addiction (Furst & Germone, 1993).

For the runners, the title used for the questionnaire in the present study was "Running Scale" (see Appendix 8.) and the content was identical to the original scale (Hailey & Bailey, 1982). The aerobics exercisers were required to fill in a questionnaire titled "Aerobics Scale" (see Appendix 9.) which as mentioned previously, consisted of minor changes to the wording of the original scale so that questions pertained specifically to aerobics. This was executed in a similar manner to Furst & Germone (1993) who modified the scale for general exercisers and titled it "Exercise Survey" and Sewell, Clough and Robertshaw (1995) who modified the scale for golfers.

Although information on the reliability and validity of this scale is scant, with no reliability studies being available, the scale appears to have subsequently been used with some success (Anderson, Basson, Geils & Farman, 1997; Thornton and Scott, 1995 & Furst and Germone, 1993).

#### 5.4.4.1 Reliability:

The Cronbach alpha reliability coefficients obtained for the present study are as follows:

**Table 5.4.: Cronbach alpha coefficients as obtained by the present study.**

<b>RUNNERS</b> <i>n</i> = 109	<b>AEROBICS</b> <i>n</i> = 51	<b>RUNNERS &amp; AEROBICS</b> <i>n</i> = 160
.65	.70	.67

Again, the figures obtained for the runners and both groups combined are not ideal. The analyses for all three groups indicate that items 13(b) (*I run in unfavourable conditions/I attend aerobics regardless of weather conditions*) and 13(h) (*I am usually disciplined and do runs/aerobics on days that I don't feel like doing it*) are problematic items in terms of lowering the scale's reliability. Furthermore, for the runners, item number 10 (*It is important for all runners to takes some time off from their regular running routine*) and for the aerobics exercisers, item number 1 (*During an average week I attend aerobics...*) lowered the alpha coefficients.

#### **5.4.4.2. Validity:**

Thornton and Scott (1995) indicate that the NAS has strong face-validity and that each item is equally weighted to provide a total score. Correlation analyses between the subscales of incentives from the Personal Incentives for Exercise (PIE) questionnaire and the NAS yielded positive coefficients ranging from  $r = 0.02$  to  $r = 0.54$  (significant at  $p = 0.01$ ). Regression analyses suggest that both mastery and social recognition were significant predictors of addiction scores with mastery being the most important.

Means and standard deviations are reported in chapter six. The use of 3 as the cut-off point to divide the groups into more addicted and less addicted exercisers will be discussed in detail in chapter six.

#### **5.4.5. Exercise Commitment:**

In order to explore the commitment axis of the "Model of Participation in Running" as proposed by Sachs and Pargman (1997) (see chapter two) without an additional questionnaire, the present study extracted various items from the biographical questionnaires in an attempt to construct a composite measure of exercise commitment. The choice of the items was guided by the literature on commitment to running (Sachs & Pargman, 1997; Joseph and Robbins, 1981 and Sachs, 1981) and the measure pertains to a number of cognitive-intellectual aspects of exercise, specifically running. An attempt was made to utilise similar aspects for aerobics exercise. The measure consisted of 7 items including question numbers 7, 9b, 11, and the four aspects of question 18 (question 16 for the aerobics exercisers) of the biographical questionnaires (see Appendices 2. and 3.). Continuous variables were transferred into dichotomous variables, and once the frequencies had been studied, the items were rank ordered with a rating ranging from 1 (low) to 5 (high). The measure for commitment was the total score which ranged from 0 (low) to 35 (high). The items relate to the importance of exercise in the individual's life, the frequency per week one ran or attended aerobics, the distance per week one ran or the number of classes one attended and how fit one perceived oneself to be with regard to stamina, strength, speed and flexibility.

The rationale behind the choice of the above questions is as follows: it is hypothesised that the more important exercise is in the individual's life, the more committed s/he is. The greater distance and number of times the individual ran per week or the greater number of classes attended per week, the greater the level of commitment (in accordance with Joseph & Robbins, 1981). Furthermore, it was postulated that the individual who is committed to exercise is more likely to

pride themselves on their levels of fitness and will therefore give themselves a higher rating in this regard.

#### **5.4.5.1. Reliability:**

In terms of the inter-item reliability for this scale, the cronbach alpha coefficient obtained for this measure for the group of runners ( $n = 105$ ) was found to be satisfactory at 0.74. The scale obtained a cronbach alpha coefficient of 0.65 for the aerobics group ( $n = 56$ ) and 0.58 for the two groups combined ( $n = 161$ ) which is lower than would be ideal. The latter coefficient appears to be affected by the item which pertains to the number of times per week the exercisers run or attend aerobics. If this item was removed for the combined groups it would become 0.66. It should be noted that an attempt was made to construct a more comprehensive measure, utilising various aspects of the Negative Addiction Scale, however the cronbach alpha was reduced to below 0.53. Consequently the initial version was utilised to measure commitment to running.

Again, the use of 25 as the cut-off point at which to divide the exercisers into more committed ('committed') and less committed ('non-committed') will be discussed in detail in chapter six. It should be noted that this is an initial effort to construct a scale which measures the concept of exercise commitment, and it requires further psychometric exploration which was beyond the scope of this study.

Means and standard deviations for all instruments are reported in chapter six.

### **5.5. STATISTICAL PROCEDURES:**

All statistics were computed using the Statistical Package for Social Sciences (SPSS/PC+) (Norusis/SPSS Inc., 1988). Tests used in the analysis were a two-way analysis of (co)variance by group and sex; a three way analysis of (co)variance by group, sex and addiction; stepwise multiple regression; a one way analysis of variance by quadrant (as distinguished by addiction and commitment) and discriminant function analysis by quadrant. The Pearson product-moment correlations can be found in Appendices 10. and 11.

## 5.6. FORMAL HYPOTHESES:

1. Significant differences on measures of narcissism will be found between the three groups, with runners and aerobics exercisers scoring higher on the NPI than non-exercisers.
2. Significant differences on measures of physical self-efficacy will be found between the three groups, with runners and aerobics exercisers scoring higher on the PSE than non-exercisers.
3. Exercise addiction and narcissism will be positively related. More specifically, addicted runners and aerobics exercisers will score higher on measures of narcissism than non-addicted exercisers.
4. Differences on measures of narcissism will be explored between the runners and aerobics exercisers.
5. Exercise addiction and physical self-efficacy will be negatively related. More specifically, addicted runners and aerobics exercisers will score lower on measures of physical self-efficacy than non-addicted exercisers.
6. Differences on measures of physical self-efficacy will be explored between the runners and aerobics exercisers.
7. Differences on measures of physical self-efficacy and narcissism will be explored between the four groups of runners as distinguished by levels of addiction and commitment to running.

It should be noted that hypotheses numbers 4, 6 and 7 are essentially non-directional, exploratory hypotheses as they do not predict the direction of the relationship between variables and groups (Diamantopoulos & Schlegelmilch, 1997). Instead they are comprised of exploratory questions with regard to the relationship between narcissism and physical self efficacy in runners and aerobics exercisers (numbers 4 and 6) and in four groups of runners as determined by levels of addiction and commitment to running (number 7).

**5.7. SUMMARY:**

The purpose of the present study was to investigate differences between exercisers and non-exercisers on measures of narcissism and physical self-efficacy. Furthermore, differences between runners and aerobics exercisers, addicted and non-addicted exercisers and levels of commitment on these measures were explored. Data, via the distribution of self-administered questionnaires, was collected from a non-random sample of 211 exercisers consisting of 112 runners, 57 aerobics exercisers and 42 non-exercisers. In order to explore the significance of the abovementioned hypotheses, various statistical tests were computed through the use of SPSS/PC+.

## CHAPTER SIX

### RESULTS

#### 6.1. INTRODUCTION:

A summary of the statistical analysis of the collected data is presented in this chapter. All statistics were calculated using the Statistical Package for the Social Sciences (SPSS/PC+) and a full record of all raw data and result print-outs are available from the author on request. The chapter consists of five sections. Section one presents the sample's demographic information, whilst sections two to five consist of descriptive statistics regarding each instrument and the significant relationships pertaining to the research hypotheses. Each section is explained in more detail throughout the chapter.

In some cases, certain non-significant findings are included as they relate to the hypotheses. It has been necessary to make use of abbreviations in a number of the tables below presented in this chapter. In such cases, a key will appear immediately below the tables. All results in this chapter will be discussed using two or three decimal places, with the maximum level of significance set at 5%.

#### 6.2. SECTION ONE:

As mentioned above, this section consists of a brief presentation of the demographic characteristics of the sample.

##### 6.2.1. Demographic Information:

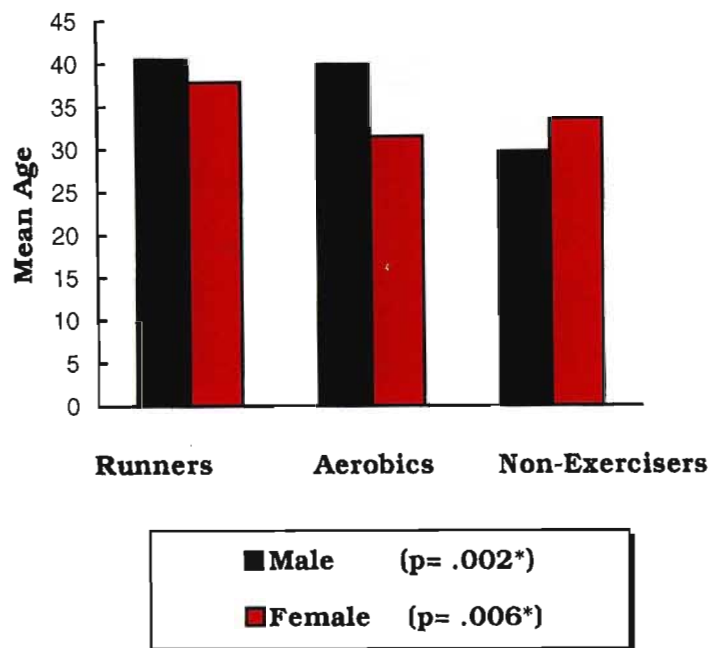
Table 6.1. reflects the breakdown of the three groups by sex and age.

**Table 6.1.: Research sample by sex and age**

GROUP	NUMBER	MEAN AGE	MINIMUM AGE	MAXIMUM AGE
<b>RUNNERS:</b>	<b>112</b>	<b>39.52</b>	<b>19</b>	<b>60</b>
Male	71	40.50	19	59
Female	41	37.80	20	60
<b>AEROBICS EXERCISERS:</b>	<b>57</b>	<b>34.23</b>	<b>26</b>	<b>57</b>
Male	19	39.84	26	57
Female	38	31.42	19	55
<b>NON-EXERCISERS:</b>	<b>42</b>	<b>32.19</b>	<b>20</b>	<b>61</b>
Male	13	29.54	20	48
Female	29	33.38	24	61
<b>TOTAL SAMPLE:</b>	<b>211</b>	<b>36.63</b>	<b>19</b>	<b>61</b>

Due to the fact that the mean age between groups appeared to be significantly different, particularly between the males in the runners and non-exercisers, a one-way analysis of variance (ANOVA) was undertaken to determine the level of significance of age between the three groups for each sex. The results of the analyses are shown below in graph 6.1.:

**Graph 6.1.: Differences between mean ages for males & females for groups 1, 2 & 3**

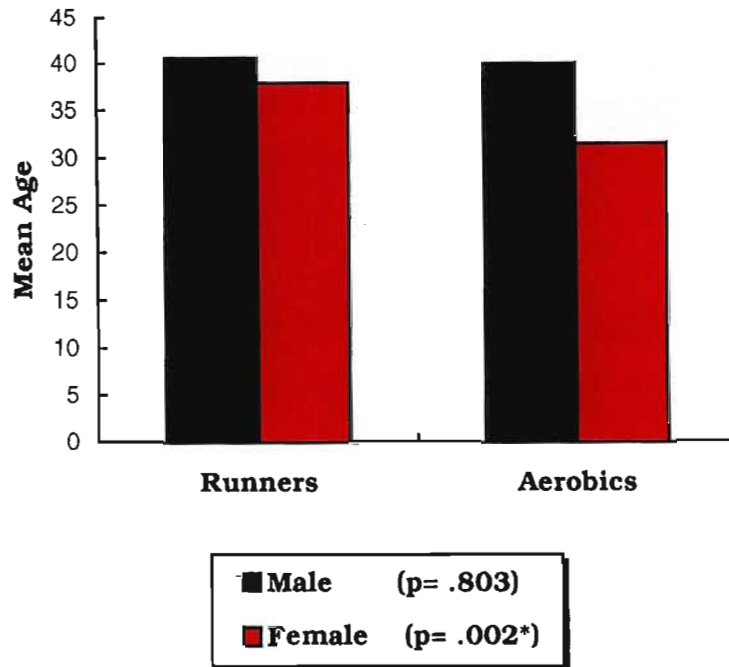


Graph 6.1. indicates a significant difference between all three groups for both males and females. With regard to the males, the runners are the oldest group, closely followed by the aerobics exercisers. The non-exercisers appear to be much younger than the other two groups. For the females, the runners are again the oldest. Both the aerobics and non-exercisers seem to be significantly younger with the aerobics group being the youngest.

Because comparisons are made between the runners and aerobics exercisers in sections three and four, a further analysis of differences between ages and the sexes for these groups was undertaken with the results being reflected in graph 6.2. overleaf.



**Graph 6.2.: Differences between mean ages for males & females for groups 1 & 2 only**



Graph 6.2. suggests no significant age difference between the males for the runners and aerobics exercisers. However, with regard to the females, the runners appear to be significantly older than the aerobics exercisers.

Although not ideal, the rigours of recruiting subjects for this study meant that there would be age-differences between groups. Albeit age plays a significant role in some of the analyses, it did not differ significantly in all analyses undertaken.

### **6.2.2. Length of Time subjects had exercised and the Exercise Frequency:**

The mean time that both the runners and the aerobics exercisers had consistently devoted to their respective activities was between 2 - 5 years. With regard to the runners, a mean of 60.99 kilometres was run per week (male = 61.76 and female = 59.66) while a mean of 4.18 classes per week was attended by the aerobics exercisers (male = 4.53 and female = 4).

### **6.2.3. Prevalence of Eating Disorders:**

Of all the subjects 6 of the 112 (5.36%) runners, 5 of the 52 (9.62%) aerobics exercisers and 2 of the 42 (4.76%) non-exercisers (13 of the 211 subjects, 6.16%) admitted to having been diagnosed and/or treated for anorexia or bulimia nervosa. This suggests that any tendency to be addicted to exercise can be viewed as a primary rather than a secondary tendency for addiction. It should be noted however, that due to the sensitive nature of the question, subjects may not have wished to be honest when answering.

### 6.3. SECTION TWO:

The following section explores all three groups (runners, aerobics and non-exercisers) and reflects the mean and standard deviations on the PSE scale and NPI. By means of a two-way analysis of covariance, differences between groups and sex pertaining to narcissism and physical self-efficacy are explored.

#### 6.3.1. Descriptive Statistics:

The following presentation of the descriptive statistics provides the total population's ( $n = 211$ ) mean scores and standard deviations for the different variables and through the use of  $t$ -tests compares them to other studies conducted in various countries. Tables reflecting the mean scores and standard deviations for each group on the PSE scale and the NPI can be found in appendices 12 and 13. Again, as a result of missing values for certain questionnaires, a number of protocols were not considered for statistical analyses. Hence, the variation in sample numbers for different variables.

##### 6.3.1.1. The Physical Self-Efficacy Scale (PSE):

Means and standard deviations of the Physical Self-Efficacy Scale (PSE) for the total sample population and for each group are reflected in Appendix 12.

Table 6.2. reflects  $t$ -Test comparisons of this sample's means on the Physical Self-Efficacy Scales with Ryckman *et al.*'s (1982) ranges for American undergraduate psychology students ( $n = 83$ ) and Cusumano, Robinson and Morooka's (1989) ranges for Japanese undergraduates ( $n = 126$ ).

**Table 6.2.:  $t$ -Test Comparisons between the Means of the PSE Subscales of the Ryckman *et al.* (1982), Cusumano *et al.* (1989) and present Studies.**

PSE SCALES	PRESENT STUDY $n = 211$		RYCKMAN <i>et al.</i> (1982) $n = 83$ (USA)		CUSUMANO <i>et al.</i> (1989) $n = 126$ (JAPAN)	
	MEAN	SD	MEAN	SD	MEAN	SD
PPA	42.96 ( $n = 198$ )	8.34	44.54	8.28	32.40***	8.20
PSPC	47.08 ( $n = 202$ )	7.73	54.00***	8.66	43.90***	6.20
Total PSE	90.35 ( $n = 192$ )	13.01	98.54***	13.85	76.30***	11.90

\*\*\*  $p < .001$

This sample's mean scores on the total PSE differed significantly with both the sample means provided by Ryckman *et al.* (1982) and Cusumano *et al.* (1989), with the present study's means being significantly lower ( $t = -4.70, p < .001$ ) and significantly higher ( $t = 9.74, p < .001$ ) than the two studies respectively. The PPA mean for the present study do not differ significantly with the Ryckman *et al.* (*ibid.*) study and is therefore comparable. However, there was a significant difference found when compared to the Cusumano *et al.* (*ibid.*) study where the present study scored higher on this measure ( $t = 11.18, p < .001$ ). This study's mean on the PSPC subscale differed from both the two studies, scoring significantly lower ( $t = -6.63, p < .001$ ) than the Ryckman *et al.* (*ibid.*) study and significantly higher ( $t = 3.90, p < .001$ ) than the Cusumano *et al.* (*ibid.*) study.

### 6.3.1.2. The Narcissistic Personality Inventory (NPI):

Means and standard deviations for the present study's total sample population and for each group on the Narcissistic Personality Inventory (Raskin & Terry, 1988) are presented in Appendix 13.

The means and standard deviations for this study were compared using the *t*-test with those obtained by Raskin & Terry (1988) and Labuschagne (1996). The comparisons are reflected in Table 6.3.

**Table 6.3.: *t*-Test Comparisons between the Means of the NPI Subscales of the Raskin & Terry (1988), Labuschagne (1996) and present studies.**

NPI	PRESENT STUDY <i>n</i> = 211		RASKIN & TERRY (1988) <i>n</i> = 1 018 (USA)		LABUSCHAGNE (1996) <i>n</i> = 85 (SA)	
	MEAN	SD	MEAN	SD	MEAN	SD
Authority	4.61	2.33	4.16**	2.17	4.51	2.30
Exhibitionism	1.43	1.47	2.21***	1.74	1.61	1.60
Superiority	1.91	1.37	2.54***	1.36	2.05	1.34
Entitlement	1.73	1.42	1.67	1.40	2.26**	1.71
Exploitativeness	1.53	1.31	1.47	1.69	1.44	1.33
Self-Sufficiency	2.67	1.59	2.09***	1.50	2.46	1.61
Vanity	1.09	1.08	1.37***	1.08	0.91	1.03
Total NPI	14.97	6.74	15.55	6.66	15.22	7.25

\*\*  $p < .01$

\*\*\*  $p < .001$

This sample's mean score on the total NPI score for narcissism as well as the NPI sub-scales of Entitlement and Exploitativeness did not differ significantly from sample means provided by Raskin and Terry (1988). Hence, on these measures, this sample was comparable with Raskin & Terry's (*ibid.*) sample. This study's means differed significantly on the Authority, Exhibitionism, Superiority, Self-Sufficiency and Vanity subscales. This sample scored significantly lower on the subscales: Exhibitionism ( $t = -6.08, p < .001$ ), Superiority ( $t = -6.12, p < .001$ ) and Vanity ( $t = -3.43, p < .001$ ). On the subscales of Authority ( $t = 2.71, p < .01$ ) and Self-Sufficiency ( $t = 5.06, p < .001$ ), this sample scored significantly higher than Raskin & Terry's (*ibid.*) sample.

With regard to the Labuschagne (1996) study, this sample's means were comparable on the total NPI score as well as all the subscales except Entitlement where the mean was significantly lower than that obtained by the Labuschagne (*ibid.*) study ( $t = -2.73, p < .01$ ).

### **6.3.2. Two-Way Analysis of Covariance, by Group and Sex, Between Runners, Aerobics and Non-Exercisers:**

In order to examine significant differences between the three groups and between sexes on the narcissism and physical self-efficacy variables, a series of two-way analyses of covariance (ANCOVA) was conducted with age as a covariate.

Due to the fact that age between groups was found to differ significantly (see graph 6.1.) and that age correlated negatively with the NPI total and NPI exhibitionism subscales (see correlation table in Appendix 10.), it was considered essential to include age when looking at the differences between groups on measures of narcissism and physical self-efficacy. Three ways of adjusting for age were considered:

- (i) Turning age into a Factor by dichotomising at the median.
- (ii) Including age as a covariate in the ANOVAS or as a predictor in the regressions.
- (iii) Purely regression methods

The first option (i.e. age as a Factor) was decided against as it would thereby make for some very small subgroups and possibly lose information. Instead, the key scores were examined for any correlation they have with age (as mentioned above) and it was decided that in order to neutralise the effect age had on the dependent variables, it would be included in the two-way analysis of variance as a covariate. Although Keppel & Zedeck's (1989) explain the fundamental interchangeability of ANOVA and Multiple Regression, it was decided to remain with the more familiar ANOVA approach and include age as a predictor in the multiple regressions (see 6.5.2.).

It is accepted that here, age as a covariate is not the situation for which the analysis of covariance (ANCOVA) method was designed (i.e. an experiment with full randomisation), however it was felt to be somewhat more appropriate than casting age as a Factor and losing information. Furthermore, the results provide a guide to thinking about the area and to follow-ups of a more detailed investigation.

Note that age does not consistently correlate significantly to all other variables and hence the significance of age as a covariate varies considerably. Furthermore, although the two-way ANCOVA between the three groups is reported with age as a covariate, it was also run as an ANOVA without age as a covariate and the different outcomes between the two methods will be reported. Rather than dealing with each two-way ANCOVA and ANOVA for each of the variables, the present study will abstract from the series of analyses and report the significant differences firstly between the three groups and then between the sexes.

#### **HYPOTHESIS 1:**

*Significant differences on measures of narcissism will be found between the three groups, with runners and aerobics exercisers scoring higher on the NPI than non-exercisers.*

##### **6.3.2.1. NPI : Effects for Narcissism by Group with Age as a Covariate**

Although no significant two-way interaction for narcissism by group and sex became apparent, the significant effects on the narcissism scale can be found in Table 6.4.

**Table 6.4.: Significant effects by group on measures of narcissism for Runners, Aerobics Exercisers and Non-Exercisers with age as a covariate.**

<b>NPI</b>	<b>RUNNERS (MEAN) n = 112</b>	<b>AEROBICS (MEAN) n = 57</b>	<b>NON- EXERCISERS (MEAN) n = 42</b>	<b>F. RATIO</b>	<b>F. PROB.</b>	<b>SIG. OF AGE COV.</b>
<b>NPI TOTAL</b>	14.51 (n = 101)	17.24 (n = 51)	15.20 (n = 40)	2.953	.055	.026*
Exploitative	1.33	1.72	1.79	3.102	.047*	n/s
Vanity	1.02	1.44	0.79	4.846	.009**	n/s

\* p < .05

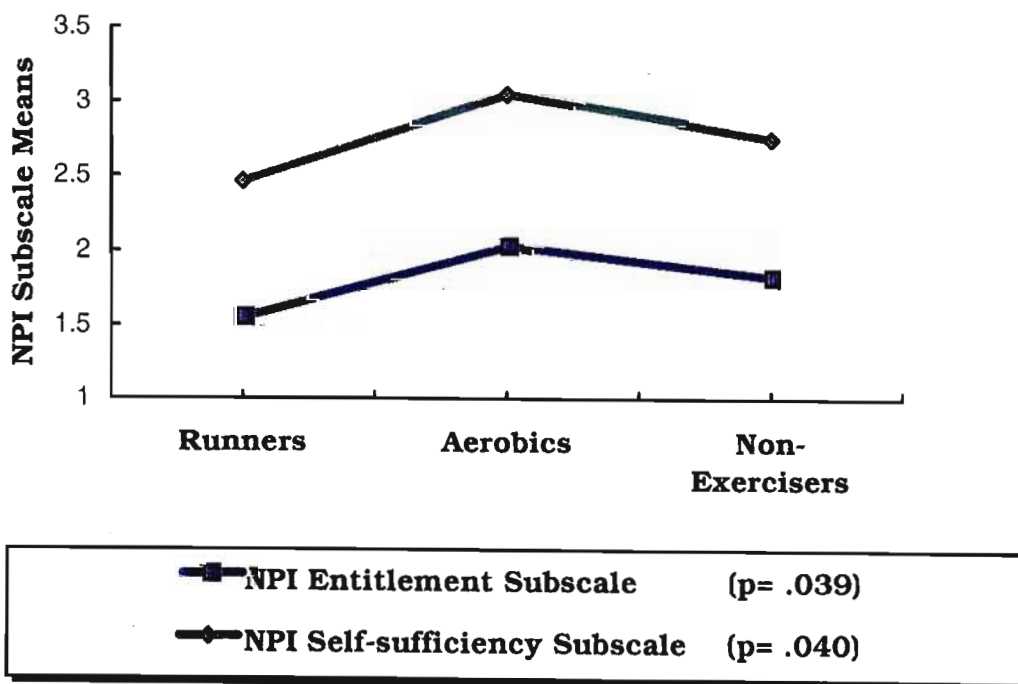
\*\* p < .01

**KEY:** Exploitative = Exploitativeness      n/s = not significant

The results on the NPI total score suggest that of all three groups, the aerobics exercisers tend to have the most narcissistic tendencies, followed by the non-exercisers, with the runners having the least tendency toward narcissism. This should be interpreted with caution as age plays a significant role for the total NPI measure. The non-exercisers however, tend to score higher on Exploitativeness than the aerobics exercisers who in turn score higher on this subscale than the runners. The Vanity subscale reveals that the aerobics group scores the highest while the non-exercisers score the lowest, with the runners in between. Age as a covariate is non-significant for both these subscales. No other subscales appeared to be significant between groups with age as a covariate.

When the two-way ANOVA was run without age as a covariate, both the Entitlement and Self-Sufficiency subscales revealed significant results with the aerobics scoring the highest, followed by the non-exercisers and the runners scoring the lowest on these subscales. These results can be found in graph 6.3.

**Graph 6.3.: Significant effects by group on the Entitlement and Self-Sufficiency subscales of the NPI for Runners, Aerobics Exercisers and Non-Exercisers without age as a covariate.**



A possible explanation for the differing results is, that when age is entered as a covariate, correlations between scores and groups will be affected. It does not however seem clear in what way age interacts with the different variables, and this needs to be further explored.

### 6.3.2.2. NPI: Effects for Narcissism by Sex with Age as a Covariate

Table 6.5. suggests that the males in all three groups have the tendency to be more narcissistic than the females, particularly on the Authority, Entitlement and Exploitativeness subscales. Age as a covariate plays a significant role for the NPI total score and the Entitlement subscales only. It is non-significant with regard to the Authority and Exploitativeness subscales. No significant sex differences were found on the remaining four subscales.

**Table 6.5.:** Significant effects by sex on measures of narcissism with age as a covariate.

NPI	MALES (MEAN) <i>n</i> = 103	FEMALES (MEAN) <i>n</i> = 108	F. RATIO	F. PROB.	SIG. OF AGE AS COVARIATE
<b>NPI TOTAL</b>	16.03 ( <i>n</i> = 95)	14.74 ( <i>n</i> = 97)	5.517	.020*	.026*
Authority	5.07 ( <i>n</i> = 95)	4.31 ( <i>n</i> = 97)	7.621	.006**	n/s
Entitlement	1.86	1.60	5.552	.019*	.023*
Exploitativeness	1.64	1.42	5.164	.024*	n/s

\*  $p < .05$

\*\*  $p < .01$

It should be noted that a significant age difference between the sexes was found ( $p = .001$ ) with the mean age for males being 39 years and for females 34.37 years. Although these ages differ statistically, it is posited that from a developmental viewpoint the age difference of approximately 5 years is minimal and will have no implications for the scales. In other words, a 34 year old female is developmentally similar to a male of 39 years.

### HYPOTHESIS 2:

*Significant differences on measures of physical self-efficacy will be found between the three groups, with runners and aerobics exercisers scoring higher on the PSE than non-exercisers.*

### 6.3.2.3. PSE : Effects for Physical Self-Efficacy by Group with Age as a Covariate

The following significant results between the three groups with regard to physical self-efficacy were found. The effects are indicated in Tables 6.6. and 6.7.

**Table 6.6.: Significant effects by group on measures of physical self-efficacy with age as a covariate (non-significant)**

PSE SCALE	RUNNERS (MEAN) <i>n</i> = 112	AEROBICS (MEAN) <i>n</i> = 57	NON- EXERCISERS (MEAN) <i>n</i> = 42	F. RATIO	F. PROB.	SIG. OF AGE COV.
TOTAL PSE	91.12 ( <i>n</i> = 101)	92.90 ( <i>n</i> = 51)	85.15 ( <i>n</i> = 40)	4.082	.018*	n/s
PPA	44.00 ( <i>n</i> = 101)	45.98 ( <i>n</i> = 51)	37.25 ( <i>n</i> = 40)	16.017	.000***	n/s

\*  $p < .05$

\*\*\*  $p < .001$

**Key:** PPA : Perceived Physical Ability  
n/s : non-significant

The above table indicates that the aerobics exercisers are more likely to have the highest sense of self-efficacy. They are followed by the runners, then the non-exercisers, specifically with regard to Perceived Physical Ability. No significant differences were found on the PSE scale. It should be noted that age played no significant role on the above scales.

### 6.3.2.4. PSE : Effects for Physical Self-Efficacy by Sex with Age as a Covariate

With regards to sex and physical self-efficacy, the significant results in Table 6.7. indicate that males are more likely to score higher both on the total PSE and the PPA subscale.

**Table 6.7.: Significant effects by sex on measures of physical self-efficacy with age as a covariate**

PSE SCALE	MALES (MEAN) <i>n</i> = 95	FEMALES (MEAN) <i>n</i> = 97	F. RATIO	F. PROB.	SIG. OF AGE AS COVARIATE
TOTAL PSE	92.79	87.96	5.957	.016*	n/s
PPA	44.51	41.76	4.938	.027*	n/s

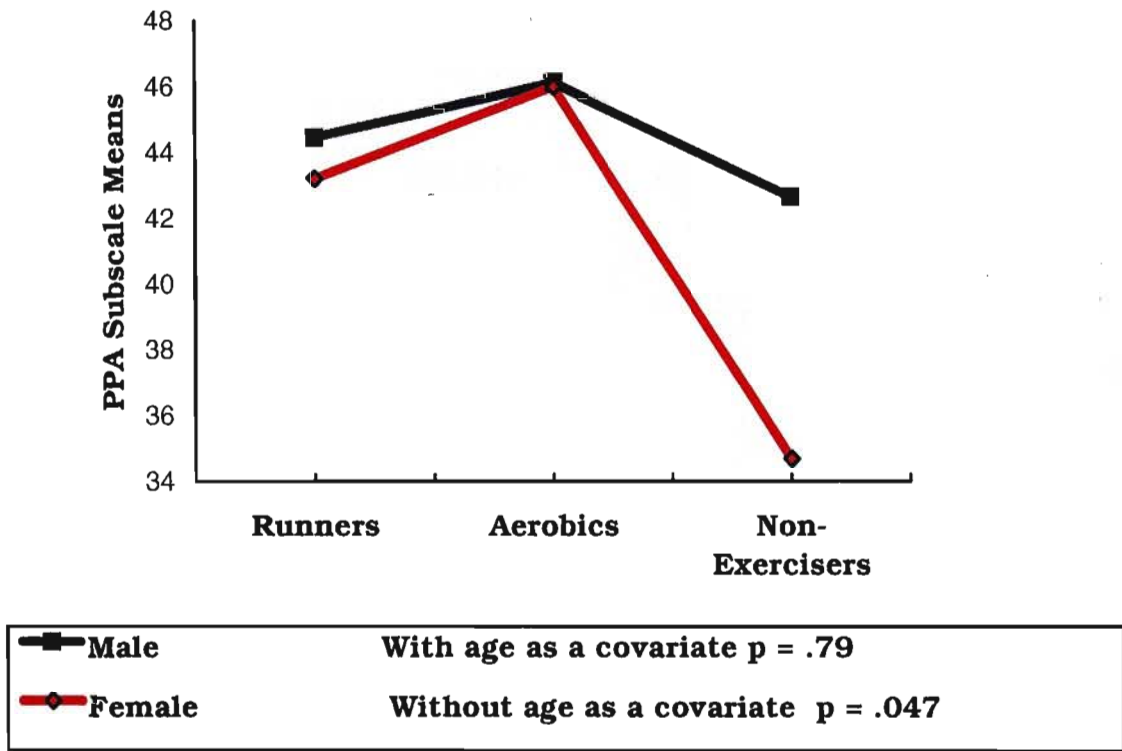
\*  $p < .05$

**Key:** PPA : Perceived Physical Ability  
n/s : non-significant



It is interesting to note, that although age does not appear to play a significant role on any of the PSE scales, when the ANOVA was run without age as a covariate, a marginally significant sex difference on the PSPC subscale was found with males scoring significantly higher on this measure than females ( $p = .047$ ). Again, this may be explained by the correlations between groups and scores being altered with age entered as a covariate.

**Graph 6.4.: Two-way interaction (Group, Sex) for Perceived Physical Ability Subscale:**



A marginally significant interaction ( $p = .047$ ) by group and sex was found for the PPA subscale of the PSE scale when age was excluded as a covariate. The graph without age as a covariate suggests that although males have a higher sense of perceived physical ability than females in all three groups, this is particularly so for the non-exercising group. However, when age is taken into consideration this interaction is no longer significant ( $p = .79$ )

#### 6.4. SECTION THREE:

In this section, the runners and aerobics exercisers **only** are examined. Both groups are divided into 'addicted' and 'non-addicted' runners and aerobics exercisers in accordance with the Negative Addiction Scale. Note that the terms 'addicted' and 'non-addicted' refer to those exercisers who have the tendency to be **more** or **less** addicted. In other words, addiction is conceptualised in terms of a process or continuum rather than an all-or-nothing condition which is unambiguously present or absent.

##### 6.4.1. The Negative Addiction Scale (NAS):

The range of negative addiction scores obtained by the runners and aerobics exercisers was widespread and can be found, together with the means and standard deviations in Table 6.8.

**Table 6.8: Ranges, Means and SDs of the NAS for the Runners and Aerobics Exercisers**

GROUP	N	RANGE	MEAN	SD
Runners	112	0 - 11	3.05	1.99
Aerobics Exercisers	57	1 - 7	3.12	1.63
<b>POPULATION</b>	<b>169</b>	<b>0 - 11</b>	<b>3.08</b>	<b>1.87</b>

Table 6.9. reflects the comparisons of the means of this sample with those obtained by Hailey & Bailey (1982), Furst & Germone (1993) and Anderson *et al.* (1997).

**Table 6.9.: t-Test Comparisons between the Means of the NAS of the Hailey & Bailey (1982), Furst & Germone (1993), Anderson *et al.* (1997) and present studies.**

PRESENT STUDY <i>n</i> = 169		STUDY 1 (USA) <i>n</i> = 60		STUDY 2 (USA) <i>n</i> = 188		STUDY 3 (SA) <i>n</i> = 49	
MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
3.08	1.87	5.39***	not listed 1.87 used	(a) 3.20 (b) 4.40***	(a) 2.20 (b) 2.20	3.82*	2.45

\*  $p < .05$

\*\*\*  $p < .001$

**Key: STUDY 1: Hailey & Bailey (1982)**

**STUDY 2: Furst & Germone (1993)**

(a) Exercisers who had exercised for up to 6 years

(b) Exercisers who had exercised for over 6 years

**STUDY 3. Anderson *et al.* (1997)**

This study's sample obtained a mean score on the NAS which was significantly lower than that obtained by Hailey & Bailey (1982) ( $t = -8.22, p < .001$ ), Furst & Germone (1993), sample (b) ( $t = -6.07, p < .001$ ) and Anderson et al. (1997) ( $t = -2.27, p < .05$ ). There was, however, no significant difference between this sample's mean on the NAS and sample (a) in Furst & Germone's (*ibid.*) study. Hence this sample was comparable with those who had exercised for up to 6 years in this study.

On the basis of the scores found in Table 6.10., the subjects were divided into two groups which consisted of those who had the tendency to be more addicted ('addicted') and those who had the tendency to be less addicted ('non-addicted'). The 122 'non-addicted' subgroup of runners and aerobics exercisers (71 male, 51 female) were identified on the basis of their NAS scores from 1 to 3. The 'addicted' subgroup ( $n = 47$ ) consisted of 19 male and 28 female with negative addiction scores of 4 and above. The median split (median = 3) supported the above grouping.

**Table 6.10.: Subgroups of runners and aerobics exercisers based on the Negative Addiction Scale ( $n = 169$ )**

NON-ADDICTED EXERCISERS					ADDICTED EXERCISERS				
GROUP	N	RANGE	$\bar{x}$	SD	GROUP	N	RANGE	$\bar{x}$	SD
Runners	81	0 - 3	2.11	0.89	Runners	31	4 - 11	5.52	1.98
Aerobics	41	1 - 3	2.27	0.74	Aerobics	16	4 - 7	5.31	1.14
Non-Addicted	122	0 - 3	2.16	0.85	Addicted	47	4 - 11	5.45	1.73

**Key:**  $\bar{x}$  = Mean

**SD** = Standard Deviation

#### 6.4.2. Sex, Age and Addiction:

In order to investigate sex and age differences in terms of addiction, two, one-way ANOVAs were run. With regard to sex, a significant difference was found between scores on the NAS ( $p = .001$ ), with females scoring higher (3.59,  $n = 79$ ) than males (2.62,  $n = 90$ ). However, when the groups were dichotomised in terms of 'non-addicted' and 'addicted' males and females and a Chi-Square test was undertaken, sex did not produce significant differences between the scores ( $p = .06$  with continuity correction). The nature of the NAS with the usage of 3 as a median split, results in sex losing its impact on the addiction scores. No significant age differences were found ( $p = .13$ ). Hence, in accordance with Anderson *et al.* (1997), Furst and Germone (1993) and Anshel (1991), age and the sexes have been collapsed when comparing the 'non-addicted' and 'addicted' groups.

### 6.4.3. Three-Way Analysis of Covariance by Sex, Group and Addiction

Relationships between addiction, narcissism and physical self-efficacy for the runners and aerobics exercisers are researched through the use of a three-way analysis of covariance by sex, group and addiction. Again, for reasons discussed in 6.3.2., the effect age had on the dependent variables was neutralised by including age in the three-way ANOVA as a covariate. Furthermore, rather than dealing with each three-way ANCOVA in sequence, the significant results will be abstracted from the series of analyses and reported firstly by addiction ('non-addicted' and 'addicted'), then by sex (male and female) and finally by group (runners and aerobics).

#### **HYPOTHESIS 3:**

*Exercise addiction and narcissism will be positively related - 'addicted' runners and aerobics exercisers will score higher on measures of narcissism than 'non-addicted' exercisers.*

#### **6.4.3.1. NPI: Effects for Narcissism by Addiction with Age as a Covariate:**

When age was included as a covariate in the three-way analysis of variance, the NPI total and the NPI subscales, Entitlement, Exploitativeness and Self-Sufficiency produced significant differences in support of the above hypothesis with the 'addicted' exercises scoring higher on the four scores than 'non-addicted' exercisers. When age had not been taken into account the means for the total measure of the NPI did not differ significantly between the 'addicted' and 'non-addicted' runners and aerobics exercisers ( $p = 0.55$ ). It did however approach significance, with the 'addicted' group scoring higher on the NPI total than the 'non-addicted' group (see Table, 6.11.).

**Table 6.11: Effects by addiction on measures of narcissism for runners and aerobics exercisers with age as a covariate**

<b>NPI</b>	<b>ADDICTED (MEAN) <i>n</i> = 47</b>	<b>NON-ADDICTED (MEAN) <i>n</i> = 122</b>	<b>F. RATIO</b>	<b>F. PROB.</b>	<b>SIG. OF AGE COV.</b>
<b>NPI TOTAL</b>	16.80 ( <i>n</i> = 40)	14.94 ( <i>n</i> = 112)	4.088	.045*	.015
Entitlement	2.04	1.58	5.540	.020*	.008
Exploitativeness	1.72	1.36	4.088	.045*	.037
Self-Sufficiency	3.06	2.50	5.564	.020*	n/s

**Key:** n/s : non-significant

\*  $p < .05$

#### 6.4.3.2. NPI: Effects for Narcissism by Sex with Age as a Covariate

With regard to sex differences on measures of narcissism, with age being taken into account, the NPI Total together with the Authority, Entitlement and Exploitativeness subscales produced significant results with the males scoring significantly higher than the females. These results are shown in table 6.12. Again, the females (34.73 years) were significantly younger ( $p = .000$ ) than the males (40.37 years) for groups 1 and 2. However, as previously discussed in 6.3.2.2., the numerical difference of approximately five years is minimal and has no developmental implications.

**Table 6.12.: Effects by sex on measures of narcissism for runners and aerobics exercisers with age as a covariate**

NPI	MALES (MEAN) $n = 90$	FEMALES (MEAN) $n = 79$	F. RATIO	F. PROB.	SIG. OF AGE AS COVARIATE
NPI TOTAL	15.76 ( $n = 82$ )	15.04 ( $n = 70$ )	5.054	.026*	.015*
Authority	5.01 ( $n = 82$ )	4.40 ( $n = 70$ )	6.351	.018*	n/s
Entitlement	1.84	1.56	8.747	.004*	.008**
Exploitativeness	1.53	1.38	4.695	.032*	.037*

\*  $p < .05$

\*\*  $p < .01$

When the three-way analysis of variance had not included age as a covariate, the NPI Total and the Exploitativeness subscale scores did not produce a significant difference between sexes ( $p = .083$  for both). Again, this may be a result of the correlations between groups and scores being altered by the inclusion of age as a covariate.

#### EXPLORATORY HYPOTHESIS 4:

*Differences on measures of narcissism will be explored between the runners and aerobics exercisers.*

#### 6.4.3.3. NPI: Effects for Narcissism by Group with Age as a Covariate

As part of the three way ANCOVA, the differences between runners and aerobics exercisers with regard to narcissism were explored. Table 6.13. reflects the results of this investigation.

**Table 6.13.: Effects by group on measures of narcissism for runners and aerobics exercisers with age as a covariate**

NPI	RUNNERS (MEAN) <i>n</i> = 112	AEROBICS EXERCISERS (MEAN) <i>n</i> = 57	F. RATIO	F. PROB.	SIG. OF AGE AS COV.
<b>NPI TOTAL</b>	14.51 ( <i>n</i> = 101)	17.24 ( <i>n</i> = 51)	6.045	.015*	.015*
Entitlement	1.55	2.02	4.572	.034*	.008**
Exploitativeness	1.33	1.72	3.906	.050*	.037*
Self-Sufficiency	2.46	3.04	5.632	.019*	n/s
Vanity	1.01 ( <i>n</i> = 105)	1.42 ( <i>n</i> = 55)	4.514	.035*	n/s

\*  $p < .05$ \*\*  $p < .01$ 

With age being taken into account the above suggests that the aerobics exercisers score significantly higher than the runners on the total NPI measure as well as the Entitlement, Exploitativeness, Self-Sufficiency and Vanity subscales, despite the fact that age is not significant on the latter two subscales.

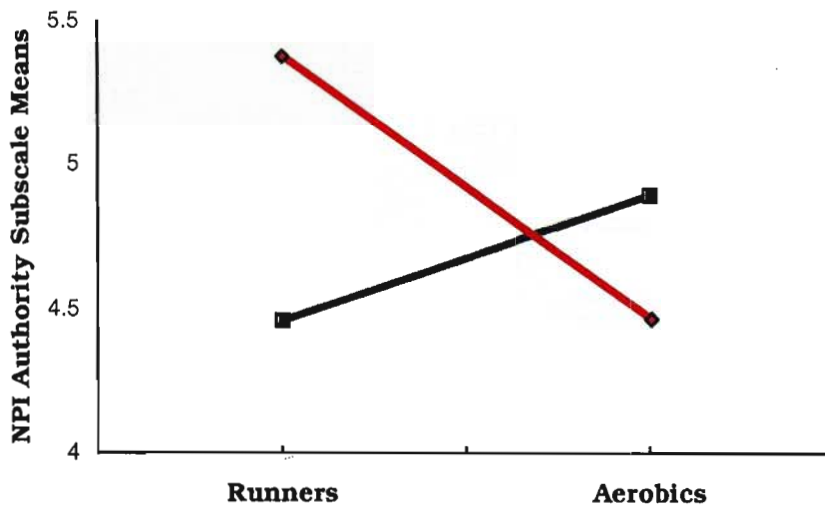
The main effects for narcissism subscales by addiction, sex and group have been reported in 6.3.4.1., 6.4.3.2. and 6.4.3.3. Each three-way analysis also includes all interaction tests and the significant interactions will be described below.

#### **6.4.3.4. Two-Way Interactions on Measures of Narcissism**

##### **6.4.3.4.1. Authority:**

A significant two-way interaction was found with regard to the NPI Authority subscale by addiction and group both with and without age being included as a covariate. This interaction is reflected in Graph 6.5.

Graph 6.5.: Two-Way Interaction (Addicts, Group) for Authority Subscale:



■ Non-addicted

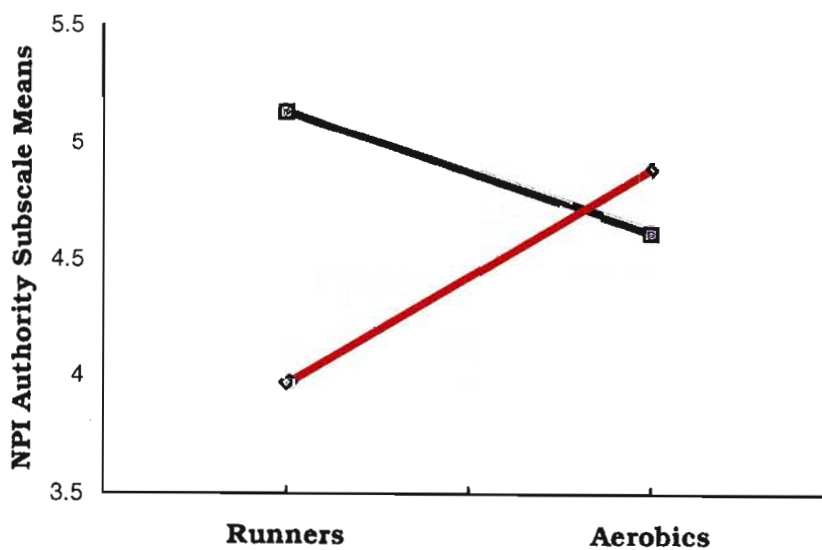
With age as a covariate  $p = .026$

◆ Addicted

Without age as a covariate  $p = .023$

Graph 6.5. suggests that regardless of age, the 'non-addicted' aerobics exercisers score significantly higher on NPI Authority than the 'non-addicted' runners and 'addicted' aerobics exercisers. However where the 'addicted' runners score higher on this measure than the 'non-addicted' runners, the 'addicted' aerobics exercisers score significantly lower than the 'addicted' runners.

Graph 6.6.: Two-Way Interaction (Sex, Group) for Authority Subscale:



■ Male

With age as a covariate  $p = .053$

◆ Female

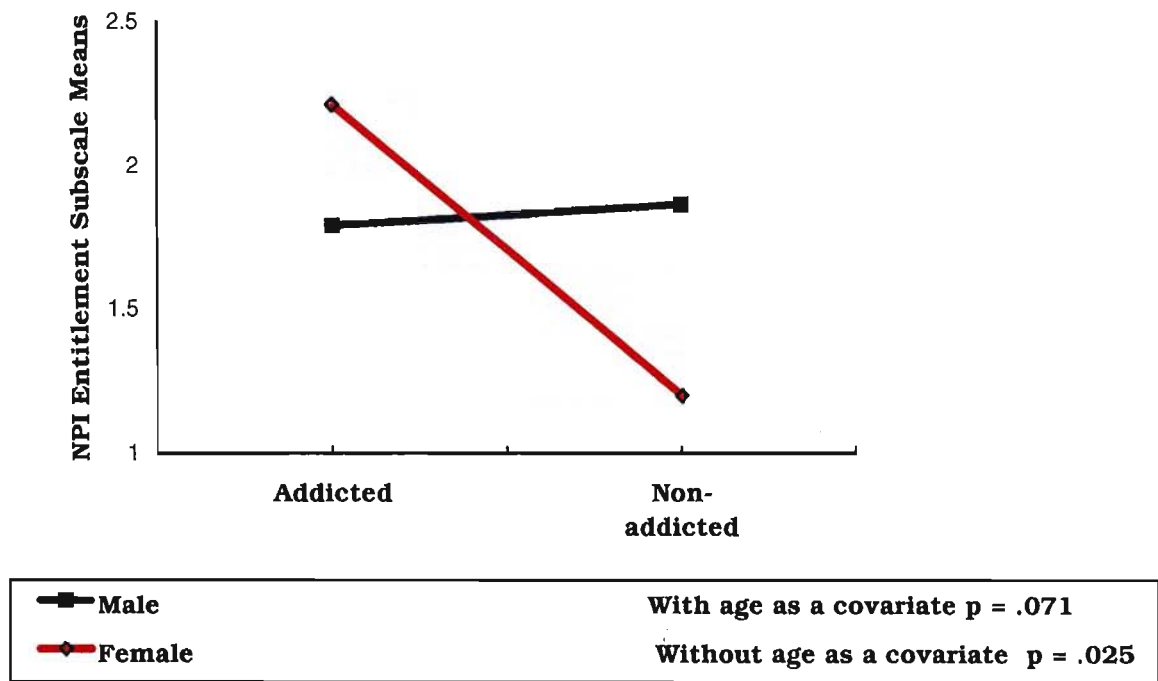
Without age as a covariate  $p = .023$

Graph 6.6. indicates that when age is not taken into account, the male runners score significantly higher on the NPI Authority subscale than the female runners, however with the aerobics exercisers, the females score significantly higher than the male aerobics exercisers. With age as a covariate, the above results, although approaching significance, are non-significant.

#### 6.4.3.4.2. *Entitlement:*

A similar result was obtained with regard to the two-way interaction between addiction and sex on the Entitlement NPI subscale. As shown by graph 6.7., when age was not taken into account, the 'addicted' female exercisers scored significantly higher on this measure than the 'addicted' male exerciser. The 'non-addicted' females, however, scored lower than the 'non-addicted' males. With age as a covariate this two-way interaction became non-significant ( $p = .071$ ).

**Graph 6.7.: Two-Way Interaction (Addicts, Sex) for Entitlement Subscale:**





#### 6.4.3.5. HYPOTHESIS 5:

*Exercise addiction and physical self-efficacy will be negatively related - 'addicted' runners and aerobics exercisers will score lower on measures of physical self-efficacy than 'non-addicted' exercisers.*

The above hypothesis was not supported by the results which are reflected in Table 6.14. below. Although the 'addicted' exercisers scored lower on the total PSE measure and the PSPC subscale and higher on the PPA subscale, these were not significant with and without age as a covariate.

**Table 6.14.: Effects by addiction on measures of Physical Self-Efficacy for runners and aerobics exercisers with age as a covariate**

PSE SCALE	ADDICTED (MEAN) <i>n</i> = 47	NON-ADDICTED (MEAN) <i>n</i> = 122	F. RATIO	F. PROB.	SIG. OF AGE COV.
TOTAL PSE	90.55 ( <i>n</i> = 40)	92.13 ( <i>n</i> = 112)	0.164	.686	n/s
PPA	45.75 ( <i>n</i> = 40)	44.28 ( <i>n</i> = 112)	1.698	.195	n/s
PSPC	44.80 ( <i>n</i> = 40)	47.86 ( <i>n</i> = 112)	3.362	.069	n/s

**Key:** PPA : Perceived Physical Ability  
 PSPC : Physical Self-Presentation Confidence  
 n/s : non-significant

Although significant sex differences with regards physical self-efficacy were found when comparing all three groups (see 6.3.2.4.) there were no significant results in terms of physical self-efficacy and sex when comparing groups one and two only.

#### EXPLORATORY HYPOTHESIS 6:

*Differences on measures of physical self-efficacy will be explored between the runners and aerobics exercisers.*

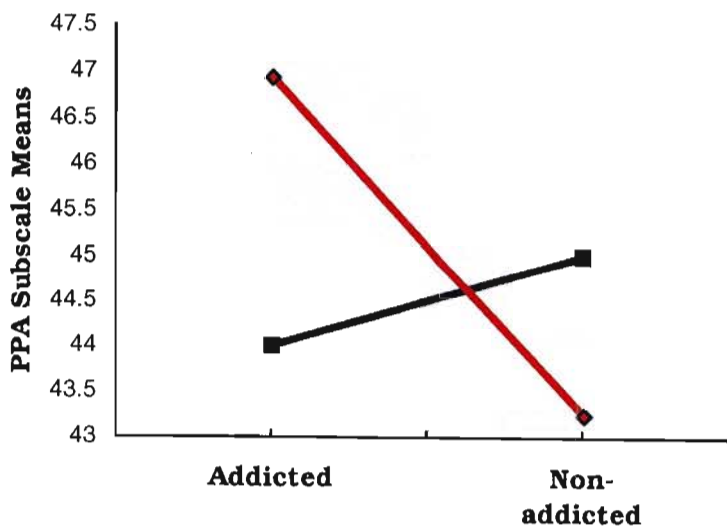
Although the runners scored lower than the aerobics exercisers on the total PSE measure and the PPA subscale and higher on the PSPC subscale, again these results were non-significant with or without age being taken into account as reflected in Table 6.15.

**Table 6.15.: Effects by group on measures of Physical Self-Efficacy for runners and aerobics exercisers with age as a covariate**

PSE SCALE	RUNNERS (MEAN) <i>n</i> = 112	AEROBICS EXERCISERS (MEAN) <i>n</i> = 57	F. RATIO	F. PROB.	SIG. OF AGE AS COV.
TOTAL PSE	91.12 ( <i>n</i> = 101)	92.90 ( <i>n</i> = 51)	1.404	.238	n/s
PPA	44.00 ( <i>n</i> = 101)	45.98 ( <i>n</i> = 51)	2.579	.110	n/s
PSPC	47.12 ( <i>n</i> = 101)	46.92 ( <i>n</i> = 51)	0.172	.679	n/s

When age was not taken into account a significant two-way interaction was found between the 'addicted' exercisers and the sex on the PPA subscale as indicated by Graph 6.8. The 'non-addicted' males scored higher than the 'addicted' males, however with regard to the females, the 'addicted' females scored significantly higher than the 'non-addicted' females as well as the 'addicted' males. However, with the addition of age as a covariate, a non-significant interaction (albeit approaching significance) was produced ( $p = .058$ ).

**Graph 6.8.: Two-Way Interaction (Addicts, Sex) for Perceived Physical Ability Subscale:**



■ Male  
◆ Female

With age as a covariate  $p = .058$

Without age as a covariate  $p = .045$

## 6.5. SECTION FOUR:

This section consists of a multiple regression analysis which was used to determine the impact of all previously-found significant research variables on exercise addiction for runners and aerobics exercisers.

### 6.5.1. Exercise Commitment

Due to the introduction of exercise commitment as an independent variable in the multiple regression analysis, Table 6.16. reflects, descriptive statistics for this measure.

**Table 6.16.: Ranges, Means and SDs of Commitment for the Runners and Aerobics Exercisers**

GROUP	N	RANGE	MEAN	SD
Runners	105	13 - 34	24.73	3.84
Aerobics Exercisers	56	18 - 35	23.66	2.98
<b>POPULATION</b>	<b>161</b>	<b>13 - 35</b>	<b>24.36</b>	<b>3.59</b>

### 6.5.2. Multiple Regression Analysis:

In view of the previous findings a further investigation was used to determine the influence of various independent variables on exercise addiction for the runners and aerobics exercisers. The method utilised was stepwise multiple regression with the independent variables as follows: Age, Commitment, Perceived Physical Ability (PPA) and Physical Self-Presentation Confidence (PSPC) subscales from the PSE scale, Authority, Entitlement, Exploitativeness, Self-Sufficiency and Vanity subscales from the NPI. These variables were selected on the basis that they produced significant results in sections one and three of the statistical analysis.

Table 6.17. reflects the results for the runners only (group one), with table 6.18. representing the aerobics exercisers (group two) and table 6.19. both groups combined.

**Table 6.17.: Stepwise Multiple Regression Analysis: Age, Commitment, PPA, PSPC, Authority, Entitlement, Exploitativeness, Self-Sufficiency and Vanity with Running Addiction as the dependent variable (Runners only).**

DEPENDENT VARIABLE	STEP NO. <i>n</i> = 97	INDEPENDENT VARIABLE	M R	R <sup>2</sup>	F	Sig. of F
Running Addiction	1	Commitment	.36	.13	14.08	.0003
	2	PSPC (PSE)	.47	.22	13.63	.0000
	3	Self-Sufficiency (NPI)	.54	.29	12.45	.0000

For the runners, the stepwise procedure first entered Commitment as the best predictor of running addiction. Commitment accounted for 13% of the variance of running addiction scores. Two further variables were entered, with the Physical Self-Presentation Confidence subscale of the PSE accounting for another 9% and the Self-Sufficiency Subscale of the NPI further accounting for 7%. Overall, the three variables together account for 29% ( $R^2 = .29$ ,  $p < .0001$ ) of the variance of the running addiction scores. The variables accounting for the other 71% of the variance of scores are unknown.

**Table 6.18.: Stepwise Multiple Regression Analysis: Age, Commitment, PPA, PSPC, Authority, Entitlement, Exploitativeness, Self-Sufficiency and Vanity with Aerobics Addiction as the dependent variable (Aerobics Exercisers only).**

DEPENDENT VARIABLE	STEP NO. <i>n = 50</i>	INDEPENDENT VARIABLE	M R	R <sup>2</sup>	F	Sig. of F.
Aerobics Addiction	1	PSPC (PSE)	.40	.16	9.00	.0043
	2	PPA (PSE)	.49	.24	7.53	.0015
	3	Vanity (NPI)	.57	.32	7.33	.0004

When undertaking the stepwise procedure for the aerobics exercisers, the Physical Self-Presentation Confidence subscale of the PSE was entered first as the best predictor of aerobic exercise addiction, accounting for 16% of the variance of scores. The Perceived Physical Ability of the PSE scale and the Vanity subscale from the NPI were also found to be significant predictors, each accounting for a further 8% of the variance. Together the three variables account for 32% ( $R^2 = .32$ ,  $p < .001$ ) of the variance of the aerobic exercise addiction scores, with the other 68% of the variance being accounted for by unknown variables.

**Table 6.19.: Stepwise Multiple Regression Analysis: Age, Commitment, PPA, PSPC, Authority, Entitlement, Exploitativeness, Self-Sufficiency and Vanity on Exercise Addiction as the dependent variable (Runners and Aerobics Exercisers).**

DEPENDENT VARIABLE	STEP NO. <i>n = 147</i>	INDEPENDENT VARIABLE	M R	R <sup>2</sup>	F	Sig. of F
Exercise Addiction	1	PSPC (PSE)	.28	.08	12.51	.0005
	2	Commitment	.43	.18	16.25	<.0005
	3	Self-Sufficiency (NPI)	.47	.22	13.35	.0005

As reflected in table 6.19., for both groups one and two combined, the stepwise procedure first put in the Physical Self-Presentation Confidence subscale of the PSE as a predictor of exercise addiction. This variable accounted for 8% of the variance of exercise addiction scores. Two further significant variables were added - Commitment (adding a further 10%) and the Self-Sufficiency subscale of the NPI which accounted for a further 4%. Together, all three predictors account for 22% ( $R^2 = .29$ ,  $p < .001$ ) of the variance of the exercise addiction scores, with the other 78% being accounted for by unknown variables.

## 6.6. SECTION FIVE:

The following section confines itself to the group of runners alone. In accordance with Sachs' (1997) model of commitment to running, the group of runners is divided into four groups with regard to commitment to running and addiction (refer to chapter two).

On the basis of the scores found in Table 6.20., the runners were divided into two groups which consisted of those who were more committed ('committed') and those who were less committed ('non-committed'). Again, commitment to running is conceptualised as a continuum rather than either absent or present. The 47 'non-committed' subgroup of runners (31 male, 16 female) were identified on the basis of their commitment scores from 13 to 24. The 'committed' subgroup ( $n = 58$ ) consisted of 36 male and 22 female with Commitment scores of 25 and above. The median split (median = 25) was used to create the above grouping.

**Table 6.20: Subgroups of runners based on the commitment score ( $n = 105$ )**

COMMITTED RUNNERS $n = 58$				NON-COMMITTED RUNNERS $n = 47$			
N	RANGE	MEAN	SD	N	RANGE	MEAN	SD
58	25 - 34	27.43	2.41	47	13 - 24	21.40	2.37

As per Sachs & Pargman (1997), the group of runners was further divided into four quadrants on the basis of 'addicted' and 'non-addicted' and 'committed' and 'non-committed' runners using the NAS and commitment scores. The four quadrants are as follows:

**Quadrant A: High Addiction, High Commitment (HA,HC)** ( $NAS > 3$ ;  $Commitment > 24$ )

**Quadrant B: High Addiction, Low Commitment (HA,LC)** ( $NAS > 3$ ;  $Commitment \leq 24$ )

**Quadrant C: Low Addiction, Low Commitment (LA,LC)** ( $NAS \leq 3$ ;  $Commitment \leq 24$ )

**Quadrant D: Low Addiction, High Commitment (LA,HC)** ( $NAS \leq 3$ ;  $Commitment > 24$ )

Figure 6.1. reflects the number of runners and a number of descriptives in each quadrant. Due to the extremely small number in Quadrant B (for which a possible explanation can be found in Chapter two with regards the instability of Quadrant B), descriptives regarding sex, age and the number of years consistently involved in running were explored. The groups, however, do not appear to be exceptionally different with regard to these variables.

**Figure 6.1.: Breakdown of Runners into Four Quadrants according to Levels of Running Addiction and Commitment with regard number, sex, age and length of time running.**

<b>COMMITMENT TO RUNNING</b>	<b>QUADRANT D:</b> (LA,HC)	<b>QUADRANT A:</b> (HA,HC)
	N = 36	N = 22
	<b>Number of Males:</b> 24	<b>Number of Males:</b> 12
	<b>Number of Females:</b> 12	<b>Number of Females:</b> 10
	<b>Mean Age:</b> 40.19 years (SD=8.35)	<b>Mean Age:</b> 36.73 years (SD=9.61)
	<b>Mean no. of yrs run:</b> 4.64 (SD=.68)	<b>Mean no. of yrs run:</b> 4.67 (SD=.73)
	<b>QUADRANT C:</b> (LA,LC)	<b>QUADRANT B:</b> (HA,LC)
	N = 42	N = 5
	<b>Number of Males:</b> 28	<b>Number of Males:</b> 3
	<b>Number of Females:</b> 14	<b>Number of Females:</b> 2
	<b>Mean Age:</b> 38.05 years (SD=9.60)	<b>Mean Age:</b> 48.80 years (SD=11.95)
	<b>Mean no. of yrs run:</b> 4.50 (SD=.82)	<b>Mean no. of yrs run:</b> 4.60 (SD=.89)
	<b>ADDICTION TO RUNNING</b>	

**Key:**

- HA,HC: High Addiction, High Commitment  
 HA,LC: High Addiction, Low Commitment  
 LA,LC: Low Addiction, Low Commitment  
 LA,HC: Low Addiction, High Commitment

### 6.6.1. EXPLORATORY HYPOTHESIS 7:

*Differences on measures of physical self-efficacy and narcissism will be explored between the four groups of runners as distinguished by levels of addiction and commitment to running.*

In order to determine the differences between the mean ages for the four quadrants a one-way ANOVA was undertaken and produced a non-significant result of .053, hence the ANOVA as opposed to the ANCOVA will be discussed.

#### 6.6.1.1. One-Way Analysis of Variance Between Quadrants of Runners:

A one way analysis of variance investigated the differences between the four quadrants on measures of narcissism and physical self-efficacy. Although no significant differences were found between the four quadrants on the total measures of either narcissism (NPI) or physical self-efficacy (PSE), the subscales Perceived Physical Ability (from the PSE) and Self-Sufficiency (from the NPI) produced significant results as reflected in Table 6.21.

**Table 6.21.: Significant Differences between four quadrants of Runners as distinguished by levels of addiction and commitment to running on the Perceived Physical Ability (of the PSE scale) and Self-Sufficiency (of the NPI) Subscales.**

SUBSCALES	QUADRANTS (MEANS) (N = 105)				F.RATIO	F.PROB
	A (n=22)	B (n=4)	C (n=41)	D (n=31)		
Perceived Physical Ability (PSE)	45.00	47.25	41.56	46.10	2.939	.037*
Self-Sufficiency (NPI)	3.57	2.50	2.12	2.58	4.768	.004**

\* p < .05

\*\* p < .01

**Key:**

**A: High Addiction, High Commitment (HA,HC)**

**B: High Addiction, Low Commitment (HA,LC)**

**C: Low Addiction, Low Commitment (LA,LC)**

**D: Low Addiction, High Commitment (LA,HC)**

With regard to the PSE subscale - Perceived Physical Ability, quadrant B (high addiction, low commitment) scores significantly higher than quadrant D (low addiction, high commitment) followed by quadrant A (high addiction, high commitment). Quadrant C (low addiction, low commitment) obtained the lowest PPA score.

The means obtained by the quadrants on the Self-Sufficiency subscale of the NPI indicate that quadrant A (HA,HC) scores significantly higher than quadrants B, C and D. Quadrant D (LA,HC) follows A and is followed by quadrant B (HA,LC). The lowest score obtained on this measure was by quadrant C (LA,LC).

#### 6.6.1.2. Discriminant Function Analysis for the Four Quadrants of Runners:

Despite the small number of subjects in Quadrant B, a discriminant function analysis was utilised in order to identify those variables most effective in discriminating between the four quadrants of runners as distinguished by levels of addiction and commitment to running. Although the data is of the form that indicates a logistical regression analysis may have been utilised, due to the unequal no of cases, it was decided that the discriminant function analysis would be just as useful. Again, due to the significance in previous statistical analyses the variables used were the PSPC and PPA subscales for the PSE scale and the Authority, Entitlement, Exploitativeness, Self-Sufficiency and Vanity subscales of the NPI.

Of the 112 runners processed by this statistical procedure, 15 were excluded from the analysis. Four of the subjects had missing or out-of-range group codes, 8 had at least one missing discriminating variable and 3 had both. Hence, 97 cases were used with the following numbers:

<b>Quadrant A:</b> High Addiction, High Commitment	n = 21
<b>Quadrant B:</b> High Addiction, Low Commitment	n = 4
<b>Quadrant C:</b> Low Addiction, Low Commitment	n = 41
<b>Quadrant D:</b> Low Addiction, High Commitment	n = 31

As with the one-way ANOVA, the only variables which were able to discriminate between subject groups were the Perceived Physical Ability (PSE) and the Self-Sufficiency (NPI) subscales as reflected by Table 6.22.

**Table 6.22.: Discriminant Function Analysis between four quadrants of runners on the PPA and PSPC subscale of the PSE, and Authority, Entitlement, Exploitativeness, Self-Sufficiency and Vanity subscales of the NPI.**

SCALE	WILKS' LAMBDA	F	SIG. OF F
Perceived Physical Ability (PSE)	0.91	2.93	.0373*
Self-Sufficiency (NPI)	0.87	4.77	.0039**

\* p < .05

\*\* p < .01



#### 6.6.1.2.1. Predicted Group Membership:

The percentage of grouped cases which were correctly classified according to the above variables chosen was 46.39%. The following percentage estimates were correctly identified as belonging to each of the four quadrants on the chosen variables:

Quadrant A (High Addiction, High Commitment) :	42.9% (n = 9)
Quadrant B (High Addiction, Low Commitment) :	75.0% (n = 3)
Quadrant C (Low Addiction, Low Commitment) :	46.3% (n = 19)
Quadrant D (Low Addiction, High Commitment) :	45.2% (n = 14)

It should be noted that the above results must be viewed with caution due to the excessively unequal number of cases in the four quadrants. It does however invite an interesting area for follow-up.

#### 6.7. SUMMARY OF RESULTS:

A number of significant findings were produced from the various statistical analyses undertaken, the details of which can be found in the relevant sections. Significant age differences were found between the sexes and all three groups (see graph 6.1.). Consequently age was accounted for in the analyses and was made a covariate. *t*-Test comparisons showed significant differences between the means and standard deviations on the PSE scale (Table 6.2.), NPI (Table 6.3.) and the NAS (Table 6.9.) for the present study's sample and those of others utilising the same psychometric instruments.

A comparison of all three groups on measures of narcissism and physical self-efficacy revealed significant differences between the groups and the sexes on both measures. With regard to narcissism, the NPI total scores and the Exploitativeness and Vanity subscale scores differed significantly between the three groups (6.3.2.1), while the NPI total score and the Authority, Entitlement and Exploitativeness subscale scores differed significantly between sexes (6.3.2.2). In terms of physical self-efficacy, the total physical self-efficacy and the Perceived Physical Ability subscale revealed significant differences between the groups and the sexes (6.3.2.3. and 6.2.3.4.).

When comparing the runners and aerobics exercisers only, significant age differences were found between the females (Graph 6.2.). Hence, age was included as a covariate for these analyses as well. Significant findings between groups were obtained on the NPI total score and the Entitlement, Exploitativeness, Self-Sufficiency and Vanity subscales (6.4.3.3.). Furthermore, the NPI total score and the Authority, Entitlement and Exploitativeness subscales produced significant results between sexes (6.4.3.2.).

A comparison of 'addicted' and 'non-addicted' exercisers revealed differences on the NPI total score and the Entitlement, Exploitativeness and Self-Sufficiency subscales (6.4.3.1.). No significant differences were found on the physical self-efficacy measures. The multiple regression analyses revealed the following variables to be predictors of exercise addiction: (i) for the runners: commitment, PSPC and Self-Sufficiency (Table 6.17); (ii) for the aerobics exercisers: PSPC, PPA and Vanity (Table 6.18) and (iii) for both groups: PSPC, commitment and Self-Sufficiency (Table 6.19).

When comparing the four groups of runners with regard to levels of commitment and addiction, the PPA subscale of the PSE and the Self-Sufficiency subscale of the NPI were significant (6.6.1.1). By means of a discriminant function analysis, these two variables were also pinpointed as being the most effective in discriminating between the four quadrants (6.6.1.2.).

## **CHAPTER SEVEN**

### **DISCUSSION**

#### **7.1. INTRODUCTION:**

The following considers the results, with particular reference to the literature regarding physical self-efficacy and narcissism, and their relationship to exercise adherence and adoption and exercise addiction. Each section will be considered in light of the hypotheses as presented in chapters five and six. A discussion regarding narcissism and physical self-efficacy, and their relationship to exercise in general, and to aerobics and running in particular, follows. Addiction to exercise and to aerobics and running is then considered. This is followed by a discussion which focuses on the runners in terms of narcissism and physical self-efficacy and level of commitment and addiction to running. The results are further discussed in light of demographic information. To conclude the chapter, limitations of the study are presented as well as suggestions for future research.

#### **7.2. DIFFERENCES BETWEEN THE GROUPS ON MEASURES OF PHYSICAL SELF-EFFICACY AND NARCISSISM:**

The following section considers comparisons of the three groups together and the runners and aerobics exercisers only, in terms of narcissism and physical self-efficacy. In terms of the literature reviewed in chapters three and four, one would expect exercisers to have a greater sense of physical self-efficacy (see 3.3.) and be more narcissistic than non-exercisers (see 4.5.). These predictions are reflected in hypotheses numbers 1 and 2 (see 5.6) Furthermore, the significant differences in narcissism and physical self-efficacy between different types of exercisers (i.e. runners and aerobics exercisers) will be considered (see exploratory hypotheses numbers 4 and 6). Sex differences on these measures are also discussed.

##### **7.2.1. Physical Self-Efficacy and Exercise:**

###### **Hypothesis:**

*Significant differences on measures of physical self-efficacy will be found between the three groups, with runners and aerobics exercisers scoring higher on the PSE than non-exercisers.*

The results of the analyses support the above hypothesis with the non-exercisers scoring significantly lower on the Total PSE score and the PPA subscale than the runners and aerobics exercisers. The PSPC scale showed no significant differences. These findings are congruent with

self-efficacy theory's assertion that highly self-efficacious individuals are more likely to engage in a greater number of behaviours than those who have a low sense of personal efficacy (McCauley, 1992). It can be postulated that the exercisers' higher sense of physical self-efficacy, particularly perceived physical ability, is a precursor to the adoption of, and adherence to, their respective activities. However, exercise may also be considered to have an effect on physical self-efficacy, indicating that as a result of exercise, individual's will have a higher sense of physical self-efficacy. It is therefore, difficult to delineate a cause and effect relationship from the above results and this may be an interesting area in future studies on exercise addiction.

### **Exploratory Hypothesis:**

*Differences on measures of physical self-efficacy will be explored between the runners and aerobics exercisers.*

When comparing the runners and aerobics exercisers only, in order to explore if these groups differed with regard to physical self-efficacy, no significant results were revealed. This suggests that, regardless of the type of exercise the subjects engaged in, their physical self-efficacy would be enhanced to a similar degree.

**7.2.1.1. Sex differences** on the physical self-efficacy scale (total PSE and PPA with age covariate and all three measures without age as a covariate) were found for the total population with males scoring significantly higher than the females. This is consistent with the significant negative correlation found for these two variables (see Appendix 10.). Although a number of studies involving self-efficacy and exercise have not indicated a difference between males and females with regard to self-efficacy scores (Terry & O'Leary, 1995; Martin & Gill, 1995; Tate, Petruzzello & Lox, 1995), it should be noted that these studies employed more task-specific measures of self-efficacy. Interestingly, Kavussanu and McAuley (1995) utilised the Physical Self-Efficacy scale in a study on exercise and optimism, and they, as with the present study, found significant differences between the sexes on this measure with males scoring higher than females.

As mentioned above, despite the growing feminist consciousness, these differences may be ascribed to traditional gender stereotypes where women are defined by characteristics such as warm, gentle, more tender and submissive (Bledsoe, 1973; Carlson, 1965; Maccoby & Jacklin, 1974; Moffett, 1975; Stoner and Kaiser, 1978, cited in Berger, 1997), and the male is perceived to be more assertive, competent and self-reliant (*ibid.*). With specific reference to physical self-efficacy, it seems that the socio-cultural stereotype of the female physique, together with a desire for

slenderness (Plaisted, 1995), may render the female feeling less physically competent than their male counterparts. The literature on self-efficacy theory (see chapter three) maintains that self-efficacy can be enhanced through exercise. This is supported by the present study in that, when physical self-efficacy between the sexes for the runners and aerobics exercisers only was examined (i.e. without the non-exercisers), the results indicate that there is no difference between the male's and female's perceived physical self-confidence. In other words, the lack of sex differences amongst the exercisers supports the assertion that physical self-efficacy plays a part in the adoption and adherence of exercise and will increase as a result of exercise, particularly for females who may have a lower sense of physical self-efficacy to start with.

### **7.2.2. Narcissism and Exercise:**

#### **Hypothesis:**

*Significant differences on measures of narcissism will be found between the three groups, with runners and aerobics exercisers scoring higher on the NPI than non-exercisers.*

The above hypothesis regarding exercisers and non-exercisers on measures of narcissism was not supported. A significant difference was found between the three groups on the NPI total score, with the aerobics exercisers obtaining the highest mean score. However, despite there being only a marginal difference between scores, the non-exercisers were found to have higher NPI scores than the runners. This finding supports findings by Davis, Claridge & Brewer (1996) which indicate that in comparison to non-exercisers, exercisers are not particularly narcissistic. They highlight the fact that the NPI mostly taps into the adjustive aspects of narcissism among normal subjects and in accordance with Pulver (1986), assert that healthy narcissism promotes good self-regard and the seeking of appropriate ways of developing and sustaining that. They conclude that the presence of narcissistic tendencies in the personality serves to enhance psychological well-being and to promote good feelings about the self.

### Exploratory Hypothesis:

*Differences on measures of narcissism will be explored between the runners and aerobics exercisers.*

When a comparison was made between the runners and aerobics exercisers only, the aerobics exercisers scored significantly higher than the runners on the NPI total and the Entitlement, Exploitativeness, Self-Sufficiency and Vanity subscales.

Taken together, these results suggest that narcissism plays a role in the *type* of exercise, rather than 'exercise' *per se*. It is postulated that the runners and aerobics exercisers may have different reasons for engaging in their specific activity and that runners are less narcissistically invested in their sport than the aerobics exercisers. The nature of the running clubs from which the majority of the running sample was drawn, was observed to be fairly sociable. Most of the runners were observed to engage in friendly conversation before and after their run. Furthermore, it was observed that many of the runners would undertake their time trial for that evening in pairs or in a group. In contrast, the majority of the aerobics exercisers were observed to attend the aerobics class and leave immediately afterwards, with very few seeming to engage in any form of conversation with other class members. It is possible that the runners run for more social, fun and health-related issues while the aerobics exercisers attend aerobics for more weight, control and narcissistic issues. Although Question 16 (runners) and Question 14 (aerobics exercisers) of the biographical questionnaire enquired into the primary motives for engaging in running and aerobics, a statistical analysis of the answers was beyond the scope of this study and invites follow-up for future research.

In addition, the differences in the scores between the runners and aerobics could be understood in terms of Miller's (1992) premise that more narcissistic individuals engage in a source of self-affirmation that minimises interpersonal risk in order to regulate tenuous self-esteem. In other words, the aerobics exercisers tend to choose their activity as a result of their higher levels of narcissism. Aerobics appears to maintain their grandiose self which results in high levels of self-sufficiency and entitlement. When they do engage in interpersonal relationships, it becomes conceivable that the aerobics exercisers would have the tendency to be more exploitative in these relationships as a means of getting their needs met, than the runners. With regard to the Exploitativeness subscale and all three groups, the non-exercisers were found to score the highest. Although this may be somewhat surprising, it should be noted that this subscale taps into (amongst others) attributes such as rebelliousness and non-conformity. It is possible that these attributes are

highlighted within the non-exercising group which consists of individuals who, despite being part of a culture that advocates physical well-being, choose not to engage in any exercise whatsoever.

Significant differences were found between the three groups on the Vanity subscale of the NPI. The aerobics exercisers scored the highest on this measure, followed by the runners and then by the non-exercisers. It seems plausible that both the runners and aerobics exercisers have more investment in their physical appearance compared with the non-exercisers. However an explanation of the differences on the Vanity subscale may be found in the nature of aerobics where the exercisers stand in a room surrounded by mirrors for one hour in contrast to the runners who have little recourse to admiring or evaluating themselves in this regard whilst actually running. As De la Torre (1995) posits when considering aerobics exercisers, "the self-confirmation they glean from careful self-scrutiny in the gym mirror is more important than any admiring reaction from another person, which often becomes an unimportant by-product" (p.27).

**7.2.2.1. Sex differences** on the measures of narcissism were found between all three groups and between groups one and two only, with males scoring significantly higher than females on the NPI total score and the Authority, Entitlement and Exploitativeness subscales. A sociological explanation, together with the formulation of Millon and Everly (1985) of the narcissistic personality (see chapter four), seems plausible here. As a result of the traditional societal bias favouring the birth of male infants, it is possible that parental and extended family attitudes, hopes and aspirations have been linked to boys and girls in a different way. Through the transmission of societal values through familial socialisation, it is postulated that boys emerge from their first year of life with an elevated sense of self, entitlement and grandiosity in comparison to girls who may feel less deserving or important. If these attitudes are conveyed and incorporated into the child's developing self, the effect is strengthened (Richman & Flaherty, 1990).

The significant two-way interaction between sex and group (runners and aerobics exercisers) on the Authority subscale further supports that the assumption that the type of exercise is a major factor when looking at the concept of narcissism. In terms of running which is perceived to be a male-dominated sport, the males scored higher on this subscale, however with regard to aerobics which is more female dominated, the females scored higher on this subscale.

Richman & Flaherty (1990) conducted preliminary research in order to address gender differences and narcissism. Although their general measure for narcissism showed no significant differences, their results indicate that males and females express their narcissistic issues in different ways. They

found that males manifested higher scores in content areas such as grandiosity, entitlement, fantasies of unlimited success, interpersonal exploitativeness and lack of empathy, in contrast to females who expressed higher distress in response to the indifference or criticism of others. They interpret their results as being consistent with the theory on early object-relational patterns, which give rise to men's exaggerated need for differentiation from others and females' need for merger with objects. This idea corresponds with Kohut's (1995) assertion that deficits arising from early selfobject relations are the need to display and be admired for one's evolving capabilities (posited by Richman & Flaherty, (1990) as being more prevalent in men) and the need to experience a sense of merger with an idealised parent (considered more prevalent in women (*ibid.*)).

### **7.3. DIFFERENCES BETWEEN THE 'ADDICTED' AND 'NON-ADDICTED' GROUPS ON MEASURES OF PHYSICAL SELF-EFFICACY AND NARCISSISM:**

This section considers the runners and aerobics exercisers only with regard to exercise addiction. The literature in chapters three and four indicates that 'addicted' exercisers will have a lower sense of physical self-efficacy than 'non-addicted' exercisers (hypothesis number 5.), and as a result will defend against their poor sense of self by exhibiting more narcissistic traits (hypothesis number 3.).

As mentioned in 6.4.1., a median split of 3 on the Negative Addiction Scale was used to identify the 'addicted' and 'non-addicted' exercisers. Although this cut-off point has limitations in that there is no empirical data suggesting that the median split is valid in terms of exercise addiction, it is compatible with the cut-off point used by Hailey and Bailey (1982) and Anderson *et al.* (1997), providing a useful clinical guideline. Interestingly, this cut-off point produced similar percentages of 'addicted' exercisers for runners (27.6%) and aerobics exercisers (28%). This fairly low percentage of 'addicted' exercisers supports Sachs and Pargman's (1997) assertion that the majority of exercisers will become involved with their activity to the extent that it becomes a positive rather than negative addiction.

Despite this, the range of negative addiction scores differed between the two groups. The runners had a larger range of NAS scores (4-11) than the aerobics exercisers (4-7), suggesting that running has a higher propensity to elicit more negative symptoms associated with addiction. It should also be noted that the scale utilised for measuring the extent of addiction was originally constructed for use with runners. Perhaps this implies that addiction to running and addiction to aerobics need to be conceptualised in two different ways.



In terms of addiction and sex differences, this study found that females had a tendency to score significantly higher on the NAS than males. This is in contrast to previous research findings using the same scale (Anderson *et al.*, 1997; Furst & Germone, 1993). Although this invites an area for follow-up, this study collapsed the sex groups when examining exercise addiction. The reason for this, is that sex did not produce significant differences when the groups had been dichotomised in terms of ‘addicted’ and ‘non-addicted’ males and females as discussed in 6.4.2.

### 7.3.1. Physical Self-Efficacy and Exercise Addiction:

#### Hypothesis:

*Exercise addiction and physical self-efficacy will be negatively related. More specifically, addicted runners and aerobics exercisers will score lower on measures of physical self-efficacy than non-addicted exercisers.*

Contrary to what was expected by the above hypothesis, physical self-efficacy did not play a significant role in exercise addiction. Interestingly, although not significant, the ‘addicted’ exercisers obtained a higher mean score for the PPA subscale than the ‘non-addicted’ exercisers. This is consistent with the belief that individuals who are engaged in consistent physical exercise will have a heightened sense of perceived physical ability. However, the extent of the addiction to the exercise does not appear to negatively affect the person’s belief in his/her abilities. Rather, it seems that the more ‘addicted’ the individual is, the more grandiose his/her perception of physical capabilities might be. This is supported by the significant positive correlations found between the PSE scales and the NPI (see Appendix 11.). Furthermore, Robbins and Joseph (1985) posit that through exercise, the ‘addicted’ exerciser gains control over bodily functions and the ability to achieve in previously unimagined or unattainable ways. As a result, the activity provides the individual with a renewed sense of self-efficacy on a daily basis.

As discussed in 7.2.1.1, the sex differences on the PSE scale fall away when examining the two groups of exercisers only (i.e. excluding the non-exercisers), thus highlighting the assertion that physical self-efficacy is enhanced through exercise. Furthermore, a significant two-way interaction between exercise addiction and sex (without age as a covariate) was found on the PPA subscale of the PSE scale. Albeit only approaching significance with age as a covariate, it seems to be a point worthwhile discussing. The results indicate that the ‘addicted’ female exercisers score higher on the PPA subscale than the ‘addicted’ males. It is postulated that again, this subscale may be tapping into a more grandiose sense of abilities and that, the extent of the involvement in physical exercise will determine the individual’s sense of physical ability.

### 7.3.2. Narcissism and Exercise Addiction:

#### Hypothesis:

*Exercise addiction and narcissism will be positively related. More specifically, addicted runners and aerobics exercisers will score higher on measures of narcissism than non-addicted exercisers.*

The above hypothesis was supported by this study with the ‘addicted’ exercisers scoring higher than the ‘non-addicted’ exercisers on the NPI total score and the Entitlement, Exploitativeness and Self-Sufficiency subscales. It therefore seems that individuals who are ‘addicted’ to exercise have a tendency to be more narcissistic than ‘non-addicted’ exercisers. The higher scores on the subscales, as noted above, suggest that ‘addicted’ exercisers have a very strong need for achievement and independence and will deny the need for interpersonal relationships where s/he could become vulnerable (Self-Sufficiency subscale). This again supports Miller’s (1992) assertion that more narcissistic individuals will seek self-affirmation through activities with little risk of interpersonal vulnerability. The results are also in accordance with those of Anderson *et al.* (1997) who found that the personality disposition of addicted runners correlates with the Schizotypal personality characterised by social detachment, a preference for privacy and isolation and unobtrusive aloofness associated with a tendency for behavioural eccentricities and low self-esteem.

Rather than conforming to societal norms, the ‘addicted’ exercisers will tend to have attributes of rebelliousness and exhibit a lack of empathy, consideration and tolerance for others (Exploitativeness and Entitlement subscales). This alludes to the lack of control the ‘addicted’ person has over his/her activities and where the activity (i.e. exercise) controls the individual’s social and work life to the extent that interpersonal relationships may fail and work responsibilities are secondary to the exercise activity. It seems that any form of interpersonal relationship is considered by the narcissist as being solely a means of gaining acknowledgement and praise. The ‘addicted’ exerciser’s needs and feelings are of primary importance, negating those of others. S/he will exercise regardless of social or interpersonal engagements and expects recognition and compliments from those with who s/he interacts.

The results suggest that exercisers in general may have a more healthy presence of narcissistic tendencies as described by Pulver (1986) and Raskin and Novacek (1989) while the ‘addicted’ exerciser tends towards the more unhealthy end of the continuum. It seems that the ‘addicted’ exerciser obtains high scores on two of the three (i.e. Exploitativeness and Entitlement) subscales

which are considered to have more potential for psychological maladjustment (Raskin & Novacek, 1989) and perhaps these individuals' high self-regard is merely a defence against unpleasurable affect-self representation linkages (Pulver, 1986). This may be an explanation for the higher PPA score obtained by the more addicted exerciser. The results obtained by this study lead to the postulation that the individual who has the tendency to be addicted to exercise may be more narcissistic as a result of a poor sense of self-esteem. It seems that s/he will defend against these feelings of incompetence by becoming involved in exercise and will thereby feel entitled to express a more grandiose picture of their perceived physical abilities.

A significant two-way interaction was found between addiction and group (runners and aerobics) for the Authority subscale where the 'addicted' runners scored much higher than the 'non-addicted' runners. This was in contrast to the aerobics exercisers whose difference on this measure was marginal and the 'non-addicted' exercisers scored higher than the 'addicted' exercisers. The results again support the study by Anderson *et al.* (1997) indicating that 'addicted' runners are more likely to present a grandiose, dominant and assertive self in order to manage hostility around the threat of vulnerability in interpersonal relationships and to regulate a fragile self-esteem than the 'addicted' aerobics exercisers.

#### **7.4. DIFFERENCES BETWEEN FOUR QUADRANTS OF RUNNERS AS DETERMINED BY LEVEL OF ADDICTION AND COMMITMENT ON MEASURES OF PHYSICAL SELF-EFFICACY AND NARCISSISM:**

The following section discusses the results obtained when exploring differences between the runners only, who were divided into four categories according to their level of addiction and commitment. As reflected by the exploratory hypothesis number 7., the aim was to explore differences between the four quadrants in terms of narcissism and physical self-efficacy. As mentioned in chapter six, the small number of cases in quadrant B. is of concern when interpreting the results of the analyses. However, it is interesting to note that the fact that Quadrant B has so few subjects, supports the assertion by Sachs & Pargman (1997) that this quadrant is the least stable of all four, and that runners will not remain in this quadrant for any length of time (see 2.7.5). Hence, it is not surprising to find so few runners in this quadrant.

Again, the use of the median split of 25 as the cut-off point to determine 'committed' and 'non-committed' exercisers, is a source of concern, particularly as there are no other studies with which to compare this point. However, as mentioned in chapter five, although informed by the literature (Sachs & Pargman, 1997; Joseph & Robbins, 1981), the construct of this measure is preliminary

and requires further psychometric exploration.

**Exploratory Hypothesis:**

*Differences on measures of physical self-efficacy and narcissism will be explored between the four groups of runners as distinguished by levels of addiction and commitment to running.*

**7.4.1. Physical Self-Efficacy and Levels of Running Addiction and Commitment:**

With regard to physical self-efficacy and commitment and addiction to exercise, PPA was the only significant variable measured by the PSE scale. PPA was not only able to discriminate between the four groups of subjects, but it was also significantly different between the groups. It appears from the results that quadrant C, the subjects of which exhibit low addiction and low commitment and who do not necessarily experience withdrawal symptoms, are less likely to have a heightened sense of physical ability than the other three quadrants. These results are consistent regard to self-efficacy theory and exercise in that if one does not have a high sense of perceived physical ability, one is less likely to engage in exercise with extreme commitment. In turn, as commitment has been shown to be a predictor of running addiction, they will be less likely to become addicted to the activity.

**7.4.2. Narcissism and Levels of Running Addiction and Commitment:**

When comparing the four quadrants on the NPI, the Self-Sufficiency subscale exhibits significant results. As with the PPA, it too, is able to discriminate between the four groups. It appears that the subjects in quadrant A who's lifestyles centre on regular running and who seek psychological well-being through their running, have a significantly higher sense of self-sufficiency than the other three quadrants. Quadrant A consists of runners who are highly 'addicted' and highly 'committed' and the differences can be explained in terms of the theories of narcissism and its relationship to exercise addiction. These individuals, as discussed in 7.3.2. are less likely, as a result of their activity, to engage in interpersonal relationships which may reveal their vulnerability. Instead, they may immerse themselves in their activity, and others are sought out merely as sources of praise and acknowledgement for their achievements.

**7.5. PREDICTORS OF EXERCISE ADDICTION:**

The multiple regression analyses reveals three predictors for exercise addiction, for the runners, aerobics exercisers and the two groups combined. When considering exercise addiction in general, PSPC, commitment and self-sufficiency are significant predictors.

It is of interest that there was only one common predictor (i.e. PSPC) for the runners and the aerobics exercisers. Commitment and Self-Sufficiency were further predictors of running addiction, while PPA and Vanity were significant predictors for aerobics addiction. Again, this seems to point to the differences between the two forms of exercise and again indicates that research into running and aerobics addiction should be conducted separately. The fact that commitment to running is the most significant predictor of running addiction is congruent with Sachs and Pargman's (1997) Model of Participation in Running which includes commitment and asserts that addiction to running should be viewed through a two-factor, as opposed to a unidimensional model. It also seems apparent that the narcissistic construct of vanity is of greater importance amongst the aerobics exercisers which has been discussed in 7.2.2.

Of statistical interest is that the stepwise multiple regression procedures enter PSPC as a common predictor of addiction for all three sets of subjects (i.e. runners, aerobics exercisers and runners and aerobics exercisers combined), however PSPC did not play a significant role in the three-way ANCOVAs which compared the 'addicted' and 'non-addicted' exercisers. These results do not coincide with Keppel and Zedeck's (1989) position regarding ANOVA and Multiple Regression and brings into question the two method's interchangeability as discussed in 6.3.2.

It is considered important for the above results to be seen in light of the differing response rates and demographic and descriptive information:

#### **7.6. RESPONSE RATE:**

Of note were the differing response rates between the three groups. The response rate of runners (66%) was higher than the aerobics exercisers (50%). Based on subjective evaluation during the data collection, the author perceived the aerobics group to be more suspicious and defensive with regard to the study and the questionnaires. On the whole the runners seemed to be more amicable and amenable, showing genuine interest in the study and the implications for their activity.

It should be noted, that although the response rate for the non-exercisers was high (70%), the author found it extremely difficult to recruit subjects for this group, particularly males. Hence the low number of subjects in this group. If, as Lasch (1979) and De la Torre (1995) assert, we live in a narcissistic culture which has become preoccupied with body functioning and how it manifests in physical appearance, it may be that fewer people are willing to admit to not engaging in any form of exercise. Such an admission is conceivably less socially desirable, particularly for a male who's traditional role has been more physically oriented than the female's.

## **7.7. DEMOGRAPHICS:**

A brief discussion with regard to the male-female ratio as well as the age of the subjects in terms of their significance to this study follows.

### **7.7.1. Sex:**

The group of runners consisted of a higher percentage of males (63%) than females while the aerobics exercisers consisted of a higher percentage of females (66%). This sample's male-female ratio for running is similar to that of other studies of the same nature (Anderson *et al.*, 1997; Gill, Henderson & Pargman, 1995; Furst & Germone, 1993; Robbins & Joseph, 1985) and there is a tendency for studies on aerobics exercise to recruit women only for their samples (e.g. Crawford & Eklund, 1994; Sonstroem, Harlow & Josephs, 1994; Plummer & Young, 1987; Eickhoff, Thorland & Ansorge, 1983). Despite the emergence of a feminist consciousness, it appears that there is an assumption that running is more a male-dominated sport, while aerobics is often associated with dance and hence generally attracts more females than males. An extremely high proportion of the non-exercising group were female (69%) which may be understood as discussed in 7.6. A similar male-female ratio for non-exercisers is reflected by Anderson *et al.*, (1997).

### **7.7.2. Age:**

The results showed significant age differences between groups and sex. As mentioned in chapter six, these differences are not ideal, however, the rigorous recruitment of subjects meant there was a possibility of age-differences between groups and sex. Due to the fact that age correlated with one of the variables being measured, i.e. narcissism (see Appendix 10.), it needed to be taken into account by means of including it as a covariate in the analyses. A detailed discussion about reasons for selecting this particular method for accounting for age, can be found in 6.3.2.

## **7.8. DESCRIPTIVE STATISTICS:**

What follows is a discussion of the psychometric instruments employed for the purposes of this study in terms of the population's score means compared with that of other studies which have utilised the same instruments. A discussion regard the reliability and validity of each scale can be found in Chapter Five.

### **7.8.1. The Narcissistic Personality Inventory (NPI):**

When comparing the mean total NPI score of this study's sample with that of Raskin & Terry's (1988) American sample and Labuschagne's (1997) South African sample, no significant differences were found. However, a comparison between scores obtained on the subscales elicited five

significant results between the present study's sample and the American sample, with only one significant difference between subscale scores being found when compared to the South African sample. Without elaborating on explanations for each subscale, suffice it to understand the many differences with regard to the American sample in terms of culture. In terms of Lasch's (1979) argument regarding the development of a 'me' generation, it seems that the American culture may indoctrinate narcissism to a greater degree than the white South African culture.

### **7.8.2. The Physical Self-Efficacy Scale (PSE):**

The mean scores obtained by the present study for the PSE scale and its subscales were compared with those of an American (Ryckman *et al.*, 1982) and a Japanese (Cusumano & Robinson, 1989) sample. All the scores obtained by the present study were significantly different to the other two samples except for the Perceived Physical Ability (PPA) subscale compared with Ryckman *et al.* (1982). Cusumano & Robinson (1989) explained significant differences between their sample's scores and those of an American sample in a similar manner as is found in 7.7.1. Their understanding of the differences was culturally based with prior research showing that Japanese tend to have a lower body image than Westerners (Lerner, Iwawaki, Chihara & Sorell, 1980, cited in *ibid.*) Similarly, the differences in scores for this study suggest cultural differences with this study's sample of South Africans having a lower sense of physical self-efficacy than the American sample, but higher physical self-efficacy than the Japanese sample.

### **7.8.3. The Negative Addiction Scale (NAS):**

Significant differences were found between mean scores obtained on the NAS by the present study's sample and those of two American samples (Hailey & Bailey, 1982; Furst & Germone(b), 1993) and a South African sample (Anderson *et al.*, 1997). However, this sample's mean score was comparable with that of Furst & Germone(a) (1993). Although the Anderson *et al.* (*ibid.*) and Hailey and Bailey (*ibid.*) scores are not associated with length of involvement in the activity, a possible explanation for the differences in scores may be due to the subject's length of running history. According to previous research (Furst & Germone, 1993; Hailey & Bailey, 1982), those individuals with a longer history of involvement in physical activity obtained higher addiction scores. This sample's mean time for being involved in running or aerobics exercise was between 2 - 5 years and hence, it is conceivable that this sample is comparable with Furst and Germone's(a) (1993) sample who had exercised for up to six years. Conversely it is to be expected that the mean scores would be significantly lower than the (b) sample which had exercised for over 6 years.

## **7.9. LIMITATIONS OF THE PRESENT STUDY:**

### **7.9.1. Research Design:**

This study is cross-sectional in nature and the absence of a longitudinal study renders it difficult to determine whether the personality characteristics of the sample (i.e. narcissism and physical self-efficacy) change as a consequence of exercise involvement or whether they are antecedents of exercise participation and addiction. In other words, the results are not able to delineate a cause and effect explanation for exercise behaviour and addiction.

### **7.9.2. Research Sample:**

The current sample was mainly derived from athletic and health clubs rather than the broader community. The clubs may reflect an emphasis on more competitive and intense running and aerobics exercise, thereby biasing the sample towards those individuals who run, to some extent, for reasons of mastery and competition. Furthermore, the race and socio-economic status of the sample tends to be mainly white and middle to upper class, which negates the possible significant interaction between personality dispositions and social forces. Convenience sampling does not easily allow for the results to be generalised to those exercisers, particularly runners, who exercise predominantly for the mental health benefits and who do not join an athletic club. In addition, the small number of non-exercisers in comparison to the other groups is of some concern.

Due to the fact that age correlates significantly with the NPI score and some of the subscales, the high level of variability with regard to the age of the subjects between the groups, is not ideal. Despite the expectation of age differences as a result of the rigours of subject recruitment, and that age was accounted for by means of a covariance of analysis, these results need to be interpreted cautiously.

### **7.9.3. Psychometric Instruments:**

It should be noted that the narcissism and physical self-efficacy instruments used for this study comprised self-report measures which are often responded to by subjects in a socially desirable, rather than truthful, manner. This is particularly pertinent with regard to the construct of narcissism. Narcissism is such that it is present in an individual's behaviour rather than his/her awareness and a self-report measure such as the NPI may not be adequate to tap into an individual's subconscious.



The median splits of 3 and 25 which were used as cut-off points for addiction and commitment respectively may further have an impact on the generalisability of the results. As Sachs and Pargman (1997) state, exercise addiction is a process, rather than being just present or absent. So too, can exercise commitment be conceptualised in this way. The measures employed in this study (NAS and commitment scale from biographical questionnaires), provide no verbal anchors to indicate the relative amounts of addiction or commitment, so it is not clear at what point a person becomes addicted or committed to exercise.

Despite being employed for golfers (Sewell, Clough & Robertshaw, 1995) and for exercise in general (Furst & Germone, 1993), the use of the NAS for different types of exercise does not appear to have been validated and hence the use of this scale as a measure of aerobics exercise addiction may be considered questionable. Furthermore, the commitment scale constructed by the author, has not been psychometrically validated in any way.

The results indicate that runners and aerobics exercisers differ significantly with regard to narcissism. Hence, the collapsing of the groups of runners and aerobics and the investigation into exercise addiction in general may be problematic. It seems that one may need to conceptualise aerobics and running addiction in different ways and it would therefore be more appropriate to separate the two forms of exercise when examining addiction.

The PSE scale which was employed to measure physical self-efficacy has been criticised for being a general, as opposed to a more task-specific, measure. Again, considering that the results appear to highlight significant differences between running and aerobics exercisers, perhaps a more task-specific measure of physical self-efficacy for each type of exercise would elicit more subtle differences. Furthermore, it appears that the PPA subscale was related to the grandiose elements of the addicted exercisers. Perhaps the utilisation of a measure such as the Body Esteem scale which measures sexual attractiveness, weight control and physical condition would have yielded more significant results in line with the hypothesis that addicted exercisers have a lower sense of self-efficacy than non-addicted exercisers.

### **7.10. SUGGESTIONS FOR FURTHER RESEARCH:**

According to Maddux (1993), in order to understand a concept, researchers need to agree on its measurement. With regard to measurement of negative addiction to exercise, it seems that further studies on the utility and reliability of the NAS is warranted, particularly with regard to the cut-off points for addiction. The conceptualisation of running addiction in terms of a two-factor dynamic model as proposed by Sachs and Pargman (1997) seems to hold promise for future research in this area. However, given that exercise commitment and addiction are viewed as existing on a continuum, the stages of movement from exercise commitment to exercise addiction should be considered. Furthermore, studies on the differences and interrelatedness between these two concepts would contribute to research in this area.

It appears that a clearer distinction between addiction to different sports would be worthwhile. Perhaps the use of more qualitative techniques, such as an in-depth follow-up interview, together with validated, task-specific self-report measures would be of benefit in this regard. This would seem to have the ability to yield richer results than purely quantitative methods. Furthermore, in order to enhance our understanding of addiction with regard to different exercise, an in-depth item-analysis of the NAS for different exercisers may be useful in terms of highlighting which items fall into the 'addicted' category for each group.

The number of black South Africans who exercise appears to be on the increase. As a result of previous apartheid structures, black South Africans formed only a minority of exercisers. With the increasing development of interest in the area of mental health in the black community, a study regarding culture and exercise addiction would be of benefit. An understanding of whether or not such a phenomenon exists in the black South African culture, and to what extent, appears to be critical when examining exercise addiction in the 'new South Africa'.

Given the various criticisms directed at personality trait research in the relationship to sport, it would seem that an interactional research design would be more appropriate. An attempt should be made to view exercise in terms of a true biopsychosocial phenomenon, and to develop more dynamic models of reciprocal causation. In such research it appears that the use of a longitudinal research design would be more effective in explaining causal relationships between personality characteristics and sport and addiction in particular.

## **CHAPTER EIGHT**

### ***SUMMARY OF STUDY AND CONCLUSION***

Based on research into exercise and in particular, exercise addiction, this study focuses on narcissism and physical self-efficacy and attempts to explore their relationship to exercise and exercise addiction. A review of the documented physical and psychological benefits of exercise is offered, highlighting the lack of evidence supporting a cause and effect explanation and the mechanism through which these psychological benefits may occur. Despite reported benefits of exercise, negative aspects which are associated with long-term participation in exercise are discussed, with a focus on the complex phenomenon of exercise addiction.

Chapter two reviews the literature on exercise addiction. Initially, it was conceptualised as a positive addiction, in that it has been shown to increase psychological strength and life satisfaction. However, various studies have shown that this addiction may develop into a negative addiction where the individual suffers from both physiological and psychological withdrawal symptoms when the planned exercise is missed. The process through which the addiction develops from a positive into a negative addiction has yet to be fully explicated. A distinction between primary and secondary exercise addiction is made and a discussion about various empirical measurements of exercise addiction is offered. This study employed the Negative Addiction Scale in order to assess exercise addiction. Various causes of exercise addiction are discussed, emphasising that a number of factors need to be taken into consideration when examining this complex phenomenon.

Chapter Three introduces the concept of self-efficacy and its usefulness in research regarding exercise performance and behaviour. A summary of self-efficacy theory is offered, followed by a look at how a poor sense of self-efficacy often plays an important role in the development of an addiction. The empirical measurement of self-efficacy is discussed, with emphasis on the Physical Self-Efficacy scale which was employed for the purposes of this study. Although self-efficacy seems to delineate a relationship between exercise adoption and maintenance and exercise addiction, further psychological factors were explored.

The concept of developmental narcissism is discussed in chapter four. Narcissism is viewed as existing on a continuum with healthy, adaptive narcissism on one end and unhealthy, maladaptive narcissism on the other. It appears that this construct has evolved considerably over the years and stimulated much discussion and research around the area. Various authors suggest that a fragile self-esteem which resulted from early developmental disturbances, may manifest in narcissistic traits in later life. Furthermore, as a result of Western society's emphasis on the body and its physical appearance, there appears to be a link between narcissism and exercise. This link is extended to addiction where, without the addiction, the addict is left with an empty self and painful affects. The Narcissistic Personality Inventory is discussed in detail as the empirical measurement for narcissism used in this study. It was chosen specifically for the study in that it measures healthy as well as unhealthy narcissism.

In accordance with the presented literature, this study hypothesised that narcissism and physical self-efficacy would play a role in exercise and exercise addiction. Physical self-efficacy appears to be involved in the adoption and adherence to exercise, however it is not clear as to whether it is a precursor or an effect of exercise. It seems that, unlike physical self-efficacy, narcissism plays a role in the *type* of exercise, rather than 'exercise' *per se*, with the aerobics exercisers scoring significantly higher on this measure than the runners. The results indicate that more narcissistic people will choose an activity such as aerobics, which, by its nature feeds into one's narcissistic needs.

The assessment of 'addicted' and 'non-addicted' exercisers supports the hypothesis that addicted exercisers will tend to be more narcissistic than non-addicted exercisers, specifically with regard to the strong need for achievement and independence and a denial for the need for interpersonal relationships where s/he could become more vulnerable. Contrary to expectations, self-efficacy did not play a significant role in exercise addiction, however this may have been a result of the generality of the measure used.

Sachs and Pargman's (1997) model of running participation involving exercise commitment and addiction appears to have promise for future research in this area. Perceived Physical Ability and Self-Sufficiency are aspects of physical self-efficacy and narcissism respectively which are likely to play a role in predicting levels of running addiction and commitment. Those who are highly committed and highly addicted seem to have a high sense of self-sufficiency and those who score low on both addiction and commitment are less likely to have a heightened sense of perceived physical ability.

The results of this study, although not conclusive in light of its limitations, suggest that narcissism and physical self-efficacy play a role in the adoption and adherence of exercise. More specifically, narcissism appears to be an important variable when considering exercise addiction. The interaction with the concept of physical self-efficacy is an equivocal one, and although non-significant, the 'addicted' exercisers exhibited a higher sense of perceived physical ability than the 'non-addicted' exercisers. It seems that addiction to different types of exercise should be conceptualised in different ways, with runners and aerobics exercisers differing significantly on various measures. The complexity of the phenomenon of exercise addiction is highlighted and suggestions with regard to future research may assist in delineating this intricate process.

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# ***APPENDICES***

# ***APPENDIX 1.***



University of Natal

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Private Bag X01 Scottsville,  
Pietermaritzburg 3209 South Africa  
Telephone (0331) 2605369 Fax (0331) 2605809

June 1997

Dear Exerciser / Non-Exerciser

**RE: RESEARCH INTO EXERCISE AND MENTAL HEALTH**

I am currently completing a degree in clinical psychology at a masters level through the psychology department at the University of Natal - Pietermaritzburg. In conjunction with my supervisor, Professor Clive Basson, I have chosen to submit a thesis in the area of sport psychology with particular reference to personality and exercise intensity.

My project is part of a larger research project on exercise and health which is currently being conducted in Kwazulu-Natal. More specifically the project is attempting to look at various personal attributes of people who do and do not exercise. The results of the project will be used to inform and advise people on the value of exercise.

It would be greatly appreciated if you would take the time to fill out the attached questionnaires which should take approximately 30 minutes to complete. Note that all personal information obtained in this study is strictly confidential and will be treated as **group** rather than **individual** information (i.e. **no** names will appear in the final report). The sole reason for asking for your name is to enable us to contact you should information be incomplete.

If, at any stage, you would like personal feedback derived from the questionnaires you may send a written request to the following address:

**ZIA LEASK  
P.O. Box 8453  
EDENGLLEN  
1613**

I will contact you personally if such a request is received.

Many thanks for your time. Your contribution to this research is greatly appreciated.

Yours sincerely

**ZIA LEASK**  
Clinical Psychology Intern

P.P.

**PROFESSOR CLIVE BASSON**  
Supervisor & Senior Lecturer

## ***APPENDIX 2.***



## BIOGRAPHICAL INFORMATION - RUNNING

RESEARCH NUMBER: \_\_\_\_\_

*Please note that all information will be kept strictly confidential*

NAME: \_\_\_\_\_

(we assure you this will be used for follow-up purposes **only** in the case of missing data)

AGE: \_\_\_\_\_

SEX: Male  Female 

OCCUPATION: \_\_\_\_\_

CONTACT TELEPHONE NUMBER: \_\_\_\_\_

MARITAL STATUS: Never Married  Married  Common law partner   
or  
Divorced  Widowed  Remarried 

RATE HOW IMPORTANT EXERCISE IS IN YOUR LIFE?

- (1) A top priority  
 (2) very important  
 (3) fairly important  
 (4) unimportant

HAVE YOU EVER BEEN DIAGNOSED WITH AND/OR TREATED FOR ANOREXIA OR BULIMIA NERVOSA?

Yes  No 

WHAT TYPE(S) OF EXERCISE/SPORT DO YOU DO?

*(Please list the exercise in column A in order of importance to you, and tick relevant responses for columns B and C for all exercise)*

A. EXERCISE	B. EXERCISE FREQUENCY			C. EXERCISE INTENSITY *		
	Less than 2x/week	2-4 x /week	5+ x /week	Low	Med	High
1.						
2.						
3.						
4.						
5.						

\* Low: Never, to slightly out of breath  
 Medium: Quite out of breath  
 High: "Huffing and puffing"/faint/nauseous

HOW MANY MONTHS/YEARS HAVE YOU CONSISTENTLY DEVOTED TO RUNNING?  
*(i.e. you have not voluntarily stopped running for more than 6 weeks. An exception to this is serious illness or injury.)*

- (a) less than 6 months [ ]
- (b) 6 months to 1 year [ ]
- (c) 1 - 2 years [ ]
- (d) 2 - 5 years [ ]
- (e) 5 and more years [ ]

ON AVERAGE, HOW MANY KILOMETRES PER WEEK DO YOU NORMALLY RUN?  
*(excluding tapering weeks or months)*

\_\_\_\_\_

- (a) HOW MANY STANDARD AND/OR HALF MARATHONS HAVE YOU COMPLETED?
- (b) WHAT HAS BEEN YOUR PERSONAL BEST TIME FOR A STANDARD/AND OR HALF MARATHON?

MARATHON	(a) NUMBER COMPLETED	(b) PERSONAL BEST TIME
Standard		___ hrs ___ mins
Half		___ hrs ___ mins

WHAT TIME WOULD YOU NORMALLY EXPECT TO RUN FOR A STANDARD AND/OR HALF MARATHON?

MARATHON	TIME
Standard	___ hrs ___ mins
Half	___ hrs ___ mins

DO YOU AIM TO RUN A SPECIFIC TIME FOR EVERY RACE YOU RUN?

- Yes [ ]      No [ ]

IF YES, APPROXIMATELY HOW FAR OUT WAS YOUR ACTUAL PERFORMANCE FROM YOUR PREDICTED PERFORMANCE?

MARATHON	PREDICTED TIME	ACTUAL TIME	DIFFERENCE
Standard	___ hrs ___ mins	___ hrs ___ mins	___ hrs ___ mins
Half	___ hrs ___ mins	___ hrs ___ mins	___ hrs ___ mins

5. HOW MANY OF THE FOLLOWING MARATHONS HAVE YOU COMPLETED AND WHAT WAS YOUR PERSONAL BEST TIME?

MARATHON	NUMBER OF TIMES RUN	PERSONAL BEST TIME
Comrades		____ hrs ____ mins
Two Oceans		____ hrs ____ mins

5. WHAT ARE YOUR PRIMARY MOTIVES FOR RUNNING?  
*(Please tick the item(s) in column 1 that apply to you. Next to those that you have ticked, place in the order of importance to you in column 2. I.e. 1 = most important, etc)*

	1.	2.
(a) I enjoy it	[ ]	[ ]
(b) to socialise with other exercisers	[ ]	[ ]
(c) to improve physical fitness	[ ]	[ ]
(d) to lose weight	[ ]	[ ]
(e) it gives me a sense of control over my body	[ ]	[ ]
(f) it puts me in a good mood	[ ]	[ ]
(g) it is part of a daily routine that can't be broken	[ ]	[ ]
(h) it is my way of coping with stress	[ ]	[ ]
(i) to keep healthy	[ ]	[ ]
(j) it is a challenge	[ ]	[ ]
(k) it is something in my life that I have control over	[ ]	[ ]

HAVE YOU EVER BEEN SELECTED TO RUN FOR A TEAM IN THE FOLLOWING GROUPINGS?

Yes [ ] No [ ]

*(If yes, tick relevant groupings and state the number of times you have been selected in column 2. If no, please leave blank.)*

	1.	2.
(a) Intercity	[ ]	[ ]
(b) Regional	[ ]	[ ]
(c) Provincial	[ ]	[ ]
(d) National	[ ]	[ ]
(e) International	[ ]	[ ]

ESTIMATE YOUR PRESENT LEVEL OF FITNESS IN THE FOLLOWING AREAS:

AREA	VERY HIGH	HIGH	MEDIUM	LOW	VERY LOW
STAMINA					
STRENGTH					
SPEED					
FLEXIBILITY					

## ***APPENDIX 3.***

## BIOGRAPHICAL INFORMATION - AEROBICS

SEARCH NUMBER: \_\_\_\_\_

*Please note that all information will be kept strictly confidential*

NAME: \_\_\_\_\_

(we assure you this will be used for follow-up purposes **only** in the case of missing data)

AGE: \_\_\_\_\_

SEX: Male  Female 

OCCUPATION: \_\_\_\_\_

CONTACT TELEPHONE NUMBER: \_\_\_\_\_

MARITAL STATUS: Never Married  Married  Common law partner

or

Divorced  Widowed  Remarried

RATE HOW IMPORTANT EXERCISE IS IN YOUR LIFE?

- (1) A top priority  
 (2) very important  
 (3) fairly important  
 (4) unimportant

HAVE YOU EVER BEEN DIAGNOSED WITH AND/OR TREATED FOR ANOREXIA OR BULIMIA NERVOSA?

Yes  No 

WHAT TYPE(S) OF EXERCISE/SPORT DO YOU DO?

*(Please list the exercise in column A in order of importance to you, and tick relevant responses for columns B and C for all exercise)*

A. EXERCISE	B. EXERCISE FREQUENCY			C. EXERCISE INTENSITY *		
	Less than 2x/week	2-4 x /week	5+ x /week	Low	Med	High
1.						
2.						
3.						
4.						
5.						

\* Low: Never, to slightly out of breath  
 Medium: Quite out of breath  
 High: "Huffing and puffing"/faint/nauseous

HOW MANY MONTHS/YEARS HAVE YOU CONSISTENTLY DEVOTED TO AEROBICS?  
*(i.e. you have not voluntarily stopped aerobics for more than 6 weeks. An exception to this is serious illness or injury.)*

- (a) less than 6 months [ ]
- (b) 6 months to 1 year [ ]
- (c) 1 - 2 years [ ]
- (d) 2 - 5 years [ ]
- (e) 5 and more years [ ]

ON AVERAGE, HOW MANY CLASSES PER WEEK DO YOU ATTEND?  
*(Including Spinning)*

\_\_\_\_\_

- (a) LIST THE DIFFERENT CLASSES THAT YOU ATTEND.
- (b) RANK ORDER THE CLASSES IN TERMS OF YOUR ENJOYMENT  
*(1 = enjoy the most, etc).*
- (c) RANK ORDER THE CLASSES IN TERMS OF WHICH YOU FIND MOST INTENSE AND CHALLENGING *(1 = most intense & challenging, etc).*

(a) CLASS	(b) LEVEL OF ENJOYMENT	(c) LEVEL OF INTENSITY

- (a) HOW MANY AEROBICS COMPETITIONS HAVE YOU PARTICIPATED IN?
- (b) WHAT HAS BEEN YOUR HIGHEST POSITION?

(a) NO. OF COMPETITIONS	(b) HIGHEST POSITION

WAS THIS RESULT EXPECTED?

Yes [ ]                      No [ ]

IF NO, WHERE DID YOU PREDICT YOUR FINISHING POSITION WOULD BE?

\_\_\_\_\_

14. WHAT ARE YOUR PRIMARY MOTIVES FOR DOING AEROBICS?

*(Please tick the item(s) in column 1 that apply to you. Next to those that you have ticked, place in the order of importance to you in column 2. I.e. 1 = most important, etc)*

- |   | 1.  | 2.  |
|---|-----|-----|
| (a) I enjoy it  | [ ] | [ ] |
| (b) to socialise with other exercisers                  | [ ] | [ ] |
| (c) to improve physical fitness                         | [ ] | [ ] |
| (d) to lose weight                                      | [ ] | [ ] |
| (e) it gives me a sense of control over my body         | [ ] | [ ] |
| (f) it puts me in a good mood                           | [ ] | [ ] |
| (g) it is part of a daily routine that can't be broken  | [ ] | [ ] |
| (h) it is my way of coping with stress                  | [ ] | [ ] |
| (i) to keep healthy                                     | [ ] | [ ] |
| (j) it is a challenge                                   | [ ] | [ ] |
| (k) it is something in my life that I have control over | [ ] | [ ] |

15. HAVE YOU EVER BEEN SELECTED FOR A TEAM AS AN AEROBICS COMPETITOR IN THE FOLLOWING GROUPINGS?

Yes [ ]                      No [ ]

*(If yes, tick relevant groupings and state the number of times you have been selected in column 2. If no, please leave blank.)*

- |                   | 1.  | 2.  |
|-------------------|-----|-----|
| (a) Intercity     | [ ] | [ ] |
| (b) Regional      | [ ] | [ ] |
| (c) Provincial    | [ ] | [ ] |
| (d) National      | [ ] | [ ] |
| (e) International | [ ] | [ ] |

16. ESTIMATE YOUR PRESENT LEVEL OF FITNESS IN THE FOLLOWING AREAS:

AREA	VERY HIGH	HIGH	MEDIUM	LOW	VERY LOW
STAMINA					
STRENGTH					
SPEED					
FLEXIBILITY					

## ***APPENDIX 4.***



**BIOGRAPHICAL INFORMATION - NON-EXERCISERS**    **APPENDIX 4.**

**RESEARCH NUMBER:** \_\_\_\_\_

*Please note that all information will be kept strictly confidential*

1. NAME: \_\_\_\_\_  
(we assure you this will be used for follow-up purposes **only** in the case of missing data)
2. AGE: \_\_\_\_\_
3. SEX:        Male [  ]        Female [  ]
4. OCCUPATION: \_\_\_\_\_
5. CONTACT TELEPHONE NUMBER: \_\_\_\_\_
6. MARITAL STATUS: Never Married [  ]        Married [  ]        Common law partner [  ]  
  **or**  
  Divorced [  ]        Widowed [  ]        Remarried [  ]
7. RATE HOW IMPORTANT EXERCISE IS IN YOUR LIFE?
- (1) A top priority  
(2) very important  
(3) fairly important  
(4) unimportant
8. HAVE YOU EVER BEEN DIAGNOSED WITH AND/OR TREATED FOR ANOREXIA OR BULIMIA NERVOSA?
- Yes [  ]        No [  ]
9. HOW LONG HAS IT BEEN SINCE YOU HAVE CONSISTENTLY NOT ENGAGED IN VIGOROUS/AEROBICS PHYSICAL EXERCISE  
(i.e. you have not exercised for a period of time regardless of good health)
- (a) less than 6 months [  ]  
(b) 6 months to 1 year [  ]  
(c) 1 - 2 years [  ]  
(d) 2 - 5 years [  ]  
(e) 5 years and more [  ]
10. PLEASE COMMENT ON REASONS FOR NOT EXERCISING:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## ***APPENDIX 5.***

NAME: \_\_\_\_\_

**INSTRUCTIONS:** Make an X in the appropriate box. Mark 1 answer and please **DO NOT** skip any items.

	STRONGLY AGREE	SOMEWHAT AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	SOMEWHAT DISAGREE	STRONGLY DISAGREE
1. I have excellent reflexes						
2. I am not agile and graceful						
3. I am rarely embarrassed by my voice						
4. My physique is rather strong						
5. Sometimes I can hold up well under stress						
6. I can't run fast						
7. I have physical defects that sometimes bother me						
8. I don't feel in control when I take tests involving physical dexterity						
9. I am never intimidated by the thought of a sexual encounter						
10. People think negative things about me because of my posture						
11. I am not hesitant about disagreeing with people bigger than me						
12. I have poor muscle tone						
13. I take little pride in my ability in sports						
14. Athletic people usually do not receive more attention than me						
15. I am sometimes envious of those better looking than myself						
16. Sometimes my laugh embarrasses me						
17. I am not concerned with the impression my physique makes on others						
8. Sometimes I feel uncomfortable shaking hands because my hands are clammy						
9. My speed has helped me out of some tight spots						
0. I find that I am not accident prone						
1. I have a strong grip						
2. Because of my agility, I have been able to do things which many others could not do						

## ***APPENDIX 6.***

## NPI

NAME: \_\_\_\_\_

**INSTRUCTIONS:** In each of the following pairs of attitudes, choose the one that you **MOST AGREE** with. Mark your answer with an X in the space provided alongside the statement. Only mark **ONE ANSWER** for each attitude pair, and please **DO NOT** skip any items.

1.	(a) I have a natural talent for influencing people	(a)
	(b) I am not good at influencing people	(b)
2.	(a) Modesty doesn't become me	(a)
	(b) I am essentially a modest person	(b)
3.	(a) I would do almost anything on a dare	(a)
	(b) I tend to be a fairly cautious person	(b)
4.	(a) When people compliment me I sometimes get embarrassed	(a)
	(b) I know that I am good because everybody keeps telling me so	(b)
5.	(a) The thought of ruling the world frightens the hell out of me	(a)
	(b) If I ruled the world it would be a better place	(b)
6.	(a) I can usually talk my way out of anything	(a)
	(b) I try to accept the consequences of my behaviour	(b)
7.	(a) I prefer to blend in with the crowd	(a)
	(b) I like to be the centre of attention	(b)
8.	(a) I will be a success	(a)
	(b) I am not too concerned about success	(b)
9.	(a) I am no better or no worse than most people	(a)
	(b) I think I am a special person	(b)
10.	(a) I am not sure if I would make a good leader	(a)
	(b) I see myself as a good leader	(b)

11.	(a) I am assertive	(a)
	(b) I wish I were more assertive	(b)
12.	(a) I like having authority over other people	(a)
	(b) I don't mind following orders	(b)
13.	(a) I find it easy to manipulate people	(a)
	(b) I don't like it when I find myself manipulating people	(b)
14.	(a) I insist upon getting the respect that is due me	(a)
	(b) I usually get the respect that I deserve	(b)
15.	(a) I don't particularly like to show off my body	(a)
	(b) I like to show off my body	(b)
16.	(a) I can read people like a book	(a)
	(b) People are sometimes hard to understand	(b)
17.	(a) If I feel competent I am willing to take responsibility for making decisions	(a)
	(b) I like to take responsibility for making decisions	(b)
18.	(a) I just want to be reasonably happy	(a)
	(b) I want to amount to something in the eyes of the world	(b)
19.	(a) My body is nothing special	(a)
	(b) I like to look at my body	(b)
20.	(a) I try not to be a show off	(a)
	(b) I will usually show off if I get the chance	(b)
21.	(a) I always know what I am doing	(a)
	(b) Sometimes I am not sure of what I am doing	(b)
22.	(a) I sometimes depend on people to get things done	(a)
	(b) I rarely depend on anyone else to get things done	(b)

23.	(a) Sometimes I tell good stories	(a)
	(b) Everybody likes to hear my stories	(b)
24.	(a) I expect a great deal from other people	(a)
	(b) I like to do things for other people	(b)
25.	(a) I will never be satisfied until I get all that I deserve	(a)
	(b) I take my satisfactions as they come	(b)
26.	(a) Compliments embarrass me	(a)
	(b) I like to be complimented	(b)
27.	(a) I have a strong will to power	(a)
	(b) Power for its own sake doesn't interest me	(b)
28.	(a) I don't care about new fads and fashions	(a)
	(b) I like to start new fads and fashions	(b)
29.	(a) I like to look at myself in the mirror	(a)
	(b) I am not particularly interested in looking at myself in the mirror	(b)
30.	(a) I really like to be the centre of attention	(a)
	(b) It makes me uncomfortable to be the centre of attention	(b)
31.	(a) I can live my life in anyway I want to	(a)
	(b) People can't always live their lives in terms of what they want	(b)
32.	(a) Being an authority doesn't mean that much to me	(a)
	(b) People always seem to recognise my authority	(b)
33.	(a) I would prefer to be a leader	(a)
	(b) It makes little difference to me whether I am a leader or not	(b)
34.	(a) I am going to be a great person	(a)
	(b) I hope I am going to be successful	(b)

35.	(a) People sometimes believe what I tell them	(a)
	(b) I can make anybody believe anything I want them to	(b)
36.	(a) I am a born leader	(a)
	(b) Leadership is a quality that takes a long time to develop	(b)
37.	(a) I wish someone would someday write my biography	(a)
	(b) I don't like people to pry into my life for any reason	(b)
38.	(a) I get upset when people don't notice how I look when I go out in public	(a)
	(b) I take my satisfactions as they come	(b)
39.	(a) I am more capable than other people	(a)
	(b) There is a lot that I can learn from other people	(b)
40.	(a) I am much like everybody else	(a)
	(b) I am an extraordinary person	(b)



## ***APPENDIX 7.***

**DSM-III (APA, 1980) Diagnostic Criteria for Narcissistic Personality Disorder:**

The following are characteristic of the individual's current and long-term functioning, are not limited to episodes of illness, and cause either significant impairment in social or occupational functioning or subjective distress:

- A. Grandiose sense of self-importance or uniqueness, e.g., exaggeration of achievements and talents, focus on the special nature of one's problems.
- B. Preoccupation with fantasies of unlimited success, power, brilliance, beauty, or ideal love.
- C. Exhibitionism: the person requires constant attention and admiration.
- D. Cool indifference or marked feelings of rage, inferiority, shame, humiliation, or emptiness in response to criticism, indifference of others, or defeat.
- E. At least two of the following characteristic of disturbances in interpersonal relationships:
  - (1) entitlement: expectation of special favors without assuming reciprocal responsibilities, e.g., surprise and anger that people will not do what is wanted
  - (2) interpersonal exploitativeness: taking advantage of others to indulge own desires or for self-aggrandizement; disregard for the personal integrity and rights of others
  - (3) relationships that characteristically alternate between the extremes of overidealization and devaluation
  - (4) lack of empathy: inability to recognize how others feel, e.g., unable to appreciate the distress of someone who is seriously ill.

**DSM-IV (APA, 1994) Diagnostic Criteria for Narcissistic Personality Disorder:**

A pervasive pattern of grandiosity (in fantasy or behaviour), need for admiration, and lack of empathy, beginning by early adulthood and present in a variety of contexts, as indicated by five (or more) of the following:

- (1) has a grandiose sense of self-importance (e.g., exaggerates achievements and talents, expects to be recognised as superior without commensurate achievements)
- (2) is preoccupied with fantasies of unlimited success, power, brilliance, beauty, or ideal love
- (3) believes that he or she is "special" and unique and can only be understood by, or should associate with, other special or high-status people (or institutions)
- (4) requires excessive admiration
- (5) has a sense of entitlement, i.e., unreasonable expectations of especially favorable treatment or automatic compliance with his or her expectations
- (6) is interpersonally exploitative, i.e., takes advantage of others to achieve his or her own ends
- (7) lacks empathy: is unwilling to recognize or identify with the feelings and needs of others
- (8) is often envious of others or believes that others are envious of him or her
- (9) shows arrogant, haughty behaviours or attitudes

**DSM-III-R (APA, 1987) Diagnostic Criteria for Narcissistic Personality Disorder:**

A pervasive pattern of grandiosity (in fantasy or behaviour), lack of empathy, and hypersensitivity to the evaluation of others, beginning by early adulthood and present in a variety of contexts, as indicated by at least *five* of the following:

- (1) reacts to criticism with feelings of rage, shame, or humiliation (even if not expressed)
- (2) is interpersonally exploitative: takes advantage of others to achieve his or her own ends
- (3) has a grandiose sense of self-importance, e.g., exaggerates achievements and talents, expects to be noticed as "special" without appropriate achievement
- (4) believes that his or her problems are unique and can be understood only by other special people
- (5) is preoccupied with fantasies of unlimited success, power, brilliance, beauty, or ideal love
- (6) has a sense of entitlement: unreasonable expectation of especially favorable treatment, e.g., assumes that he or she does not have to wait in line when others must do so
- (7) requires constant attention and admiration, e.g., keeps fishing for compliments
- (8) lack of empathy: inability to recognize and experience how others feel, e.g., annoyance and surprise when a friend who is seriously ill cancels a date
- (9) is preoccupied with feelings of envy

***APPENDIX 8.***

## RUNNING SCALE

NAME: \_\_\_\_\_

**INSTRUCTIONS:** Make an X in the appropriate box

1. During an average week I run	every day	6 days	5 days	4 days	varies
2. On days that I don't run I usually feel	tense	guilty	no different from running days	other: _____	
3. Since I have been running my interest and enjoyment in social activities has	increased	decreased	stayed the same		
4. On days that I don't run I feel depressed or mentally sluggish	strongly agree	agree	uncertain	disagree	strongly disagree
5. On days that I don't run I feel deprived	strongly agree	agree	uncertain	disagree	strongly disagree
6. If I stopped running my physical health would decline significantly	strongly agree	agree	uncertain	disagree	strongly disagree
7. Running is my primary form of recreation	strongly agree	agree	uncertain	disagree	strongly disagree
8. I experience a "runners high" on most of my runs	strongly agree	agree	uncertain	disagree	strongly disagree
9. Running is a common topic of conversation for me	strongly agree	agree	uncertain	disagree	strongly disagree
10. It is important for all runners to take some time off from their regular running routine	strongly agree	agree	uncertain	disagree	strongly disagree
11. Running has influenced my lifestyle	strongly agree	agree	uncertain	disagree	strongly disagree
12. My interest in running has caused some family or interpersonal tensions	strongly agree	agree	uncertain	disagree	strongly disagree

\* PLEASE TURN OVER \*

**13. Tick all of the responses that apply to your running behaviour:**

- (a) I run at approximately the same time every day \_\_\_\_\_
- (b) I run in unfavourable conditions (rain, cold, heat) \_\_\_\_\_
- (c) I have a consistent weekly running schedule with the same pattern of running and non-running \_\_\_\_\_
- (d) I run whatever time of the day most convenient to my other daily activities \_\_\_\_\_
- (e) I have a training partner that I run with whenever possible \_\_\_\_\_
- (f) I keep a written record of my running \_\_\_\_\_
- (g) I plan my daily activities around what time I want to run \_\_\_\_\_
- (h) I am usually disciplined and do runs on days that I don't feel like doing it \_\_\_\_\_
- (i) I set weekly mileage goals for myself \_\_\_\_\_
- (j) I am able to meet the weekly mileage goals that I set \_\_\_\_\_
- (k) I feel that <sup>if</sup> I do not maintain my self-discipline, I would stop running completely tomorrow \_\_\_\_\_

## ***APPENDIX 9.***

## AEROBICS SCALE

NAME: \_\_\_\_\_

**INSTRUCTIONS:** Make an X in the appropriate box with reference to the aerobics classes you engage in (spinning included)

1. During an average week I do aerobics	every day	6 days	5 days	4 days	varies
2. On days that I don't do aerobics I usually feel	tense	guilty	no different from aerobics days	other: _____	
3. Since I have been doing aerobics my interest and enjoyment in social activities has	increased	decreased	stayed the same		
4. On days that I don't do aerobics I feel depressed or mentally sluggish	strongly agree	agree	uncertain	disagree	strongly disagree
5. On days that I don't do aerobics I feel deprived	strongly agree	agree	uncertain	disagree	strongly disagree
6. If I stopped aerobics my physical health would decline significantly	strongly agree	agree	uncertain	disagree	strongly disagree
7. Aerobics is my primary form of recreation	strongly agree	agree	uncertain	disagree	strongly disagree
8. I experience a "high" after most of my aerobics classes	strongly agree	agree	uncertain	disagree	strongly disagree
9. Aerobics is a common topic of conversation for me	strongly agree	agree	uncertain	disagree	strongly disagree
10. It is important for all aerobics exercisers to take some time off from their regular aerobics routine	strongly agree	agree	uncertain	disagree	strongly disagree
11. Aerobics has influenced my lifestyle	strongly agree	agree	uncertain	disagree	strongly disagree
12. My interest in aerobics has caused some family or interpersonal tensions	strongly agree	agree	uncertain	disagree	strongly disagree

\* PLEASE TURN OVER \*

**13. Tick all of the responses that apply to your aerobics behaviour:**

- (a) I do aerobics at approximately the same time every day \_\_\_\_\_
- (b) I do aerobics regardless of weather conditions (rain, cold, heat) \_\_\_\_\_
- (c) I have a consistent weekly aerobics schedule with the same pattern of aerobics and non-aerobics \_\_\_\_\_
- (d) I do aerobics whatever time of the day most convenient to my other daily activities \_\_\_\_\_
- (e) I have a training partner that I do aerobics with whenever possible \_\_\_\_\_
- (f) I keep a written record of my aerobics classes \_\_\_\_\_
- (g) I plan my daily activities around what time I want to do aerobics \_\_\_\_\_
- (h) I am usually disciplined and do aerobics on days that I don't feel like doing it \_\_\_\_\_
- (i) I set weekly goals for myself regarding my aerobics \_\_\_\_\_
- (j) I am able to meet the weekly goals that I set \_\_\_\_\_
- (k) I feel that <sup>if</sup> I do not maintain my self-discipline, I would stop doing aerobics completely tomorrow \_\_\_\_\_



## ***APPENDIX 10.***

Appendix 10.: Pearson Correlations for Age, Sex, Total PSE and its subscales and the Total NPI and its seven subscales for the Total Population (Groups 1, 2 and 3).

	AGE	SEX	PSE	PPA	PSPC	NPI	AUTH	EXHIB	SUP	ENT	EXPLOIT	SELFS	VANTY
AGE	1.000	-.230**	.050	-.011	.071	-.187*	-.132	-.212**	-.053	-.156	-.109	-.104	-.039
SEX	-.230**	1.000	-.118	-.152	-.137	-.079	-.159	.029	.008	-.092	-.086	-.052	.104
PSE	.049	-.185*	1.000	.820**	.794**	.357**	.301**	.195*	.171*	.096	.215*	.321**	.214*
PPA	-.011	-.152	.820**	1.000	.302**	.293**	.244**	.182*	.092	.010	.157	.267**	.204*
PSPC	.071	-.137	.794**	.302**	1.000	.271**	.227**	.120	.186*	.050	.191*	.250**	.135
NPI	-.187*	-.079	.357**	.293**	.271**	1.000	.758**	.660**	.543**	.676**	.648**	.675**	.353**
AUTH	-.132	-.159	.301**	.244**	.227**	.758**	1.000	.393**	.284**	.461**	.385**	.371**	.063
EXHIB	-.212**	.029	.195*	.182*	.120	.660**	.393**	1.000	.270**	.375**	.395**	.238**	.208*
SUP	-.053	.008	.171*	.092	.186*	.543**	.284**	.270**	1.000	.125	.179*	.287**	.301**
ENT	-.156	-.092	.096	.100	.050	.676**	.461**	.375**	.125	1.000	.433**	.432**	.083
EXPLOIT	-.109	-.086	.215*	.157	.191*	.648**	.385**	.395**	.179*	.433**	1.000	.427**	.032
SELFS	-.104	-.052	.321**	.267**	.250**	.675**	.371**	.238**	.287**	.432**	.427**	1.000	.172*
VANTY	-.039	.104	.214*	.204*	.135	.353**	.063	.208*	.301**	.083	.032	.172*	1.000

\* p < .01

\*\* p < .001

PSE : Physical Self-Efficacy (Total)  
 PPA : Perceived Physical Ability  
 PSPC : Physical Self-Presentation Confidence

NPI : Narcissistic Personality Inventory (Total)  
 AUTH: Authority  
 EXHIB: Exhibitionism

SUP : Superiority  
 ENT : Entitlement  
 EXPLOIT: Exploitativeness

SELFS: Self-Sufficiency  
 VANTY: Vanity

## ***APPENDIX 11.***

Appendix 11.: Pearson Correlations for Addiction, Age, Sex, Total PSE and its subscales and the Total NPI and its seven subscales for the Runners and Aerobics Exercisers only (Groups 1 and 2).

	ADICTON	AGE	SEX	PSE	PPA	PSPC	NPI	AUTH	EXHIB	SUP	ENT	EXPLOIT	SELFS	VANTY
ADICTON	1.000	-.112	.256**	-.123	.111	-.293**	.059	-.001	.106	-.133	.081	.117	.166	-.094
AGE	-.112	1.000	-.279**	.016	-.083	.101	-.193*	-.152	-.210*	-.008	-.226*	-.120	-.067	-.008
SEX	-.256**	-.279**	1.000	-.107	-.021	-.148	-.055	-.131	.077	.062	-.097	-.090	-.039	.057
PSE	-.123	.016	-.107	1.000	.799**	.837**	.360**	.333**	.189*	.201*	.064	.254**	.276**	.161
PPA	.111	-.083	-.021	.799**	1.000	.340**	.321**	.306**	.209*	.100	.080	.206*	.237*	.175
PSPC	-.293**	.101	-.148	.837**	.339**	1.000	.271**	.243*	.106	.224*	.027	.210*	.215*	.093
NPI	.059	-.193*	-.055	.360**	.321**	.271**	1.000	.751**	.656**	.472**	.658**	.656**	.628**	.388**
AUTH	.001	-.152	-.131	.333**	.306**	.243*	.751**	1.000	.376**	.210*	.447**	.382**	.325**	.075
EXHIB	.106	-.210*	.077	.189*	.209*	.106	.656**	.376**	1.000	.230*	.427**	.364**	.200**	.220*
SUP	-.133	-.008	.062	.201*	.100	.224*	.472**	.210*	.230*	1.000	.010	.126	.204*	.363**
ENT	.081	-.226*	-.097	.064	.080	.027	.658**	.447**	.427**	.010	1.000	.459**	.341**	.075
EXPLOIT	.117	-.120	-.090	.254**	.206*	.210*	.656**	.382**	.364**	.126	.460**	1.000	.453**	.069
SELFS	.166	-.067	-.039	.276**	.237*	.215*	.628**	.325**	.200*	.204*	.347**	.453**	1.000	.158*
VANTY	-.094	-.008	.057	.161	.175	.093	.388**	.075	.220*	.363**	.075	.069	.158	1.000

\* p < .01

\*\* p < .001

ADICTON: Addiction  
PSE : Physical Self-Efficacy (Total)  
PPA : Perceived Physical Ability

PSPC : Physical Self-Presentation Confidence  
NPI : Narcissistic Personality Inventory (Total)  
AUTH: Authority

EXHIB: Exhibitionism  
SUP : Superiority  
ENT : Entitlement

EXPLOIT: Exploitativeness  
SELFS : Self-Sufficiency  
VANTY : Vanity

## ***APPENDIX 12.***

**Means and SDs for the Physical Self-Efficacy Scale (PSE) of the Total Sample Population and by Group**

<b>PSE SCALES</b>	<b>GROUP</b>	<b>N</b>	<b>MEAN</b>	<b>SD</b>
<b>Perceived Physical Ability (PPA)</b>	Runners	104	43.70	7.39
	Aerobics Exercisers	54	45.78	7.08
	Non-Exercisers	40	37.25	9.64
	<b>POPULATION</b>	<b>198</b>	<b>42.96</b>	<b>8.34</b>
<b>Physical Self-Presentation Confidence (PSPC)</b>	Runners	107	46.93	7.97
	Aerobics Exercisers	54	46.96	7.51
	Non-exercisers	41	47.66	7.53
	<b>POPULATION</b>	<b>202</b>	<b>47.08</b>	<b>7.73</b>
<b>Total Physical Self-Efficacy (PSE)</b>	Runners	101	91.12	12.55
	Aerobics Exercisers	51	92.90	12.27
	Non-Exercisers	40	85.15	14.18
	<b>POPULATION</b>	<b>192</b>	<b>90.35</b>	<b>13.01</b>

***APPENDIX 13.***

Means and SDs for the NPI of the Total Sample Population and by Group

SCALES	GROUP	N	MEAN	SD
<b>Authority</b>	Runners	112	4.54	2.40
	Aerobics Exercisers	57	4.77	2.27
	Non-Exercisers	42	4.60	2.26
	<b>POPULATION</b>	<b>211</b>	<b>4.61</b>	<b>2.33</b>
<b>Exhibitionism</b>	Runners	112	1.28	1.43
	Aerobics Exercisers	57	1.68	1.39
	Non-Exercisers	42	1.50	1.64
	<b>POPULATION</b>	<b>211</b>	<b>1.43</b>	<b>1.47</b>
<b>Superiority</b>	Runners	112	1.79	1.36
	Aerobics Exercisers	57	2.11	1.29
	Non-Exercisers	42	1.98	1.49
	<b>POPULATION</b>	<b>211</b>	<b>1.91</b>	<b>1.37</b>
<b>Entitlement</b>	Runners	112	1.55	1.41
	Aerobics Exercisers	57	2.02	1.43
	Non-Exercisers	42	1.81	1.40
	<b>POPULATION</b>	<b>211</b>	<b>1.73</b>	<b>1.42</b>
<b>Exploitativeness</b>	Runners	112	1.33	1.21
	Aerobics Exercisers	57	1.72	1.26
	Non-Exercisers	42	1.79	1.52
	<b>POPULATION</b>	<b>211</b>	<b>1.53</b>	<b>1.31</b>
<b>Self-Sufficiency</b>	Runners	112	2.46	1.52
	Aerobics Exercisers	57	3.04	1.56
	Non-Exercisers	42	2.74	1.74
	<b>POPULATION</b>	<b>211</b>	<b>2.67</b>	<b>1.59</b>
<b>Vanity</b>	Runners	112	1.02	1.04
	Aerobics Exercisers	57	1.44	1.10
	Non-Exercisers	42	0.79	1.05
	<b>POPULATION</b>	<b>211</b>	<b>1.09</b>	<b>1.08</b>
<b>Total NPI</b>	Runners	112	13.97	6.69
	Aerobics Exercisers	57	16.77	6.12
	Non-Exercisers	42	15.19	7.28
	<b>POPULATION</b>	<b>211</b>	<b>14.97</b>	<b>6.74</b>