

**RUNNING ADDICTION AMONG DIVISION I  
AND DIVISION II COLLEGE-AGED  
MALE AND FEMALE  
ATHLETES**

**THESIS**

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## **ABSTRACT**

### **RUNNING ADDICTION AMONG DIVISION I AND DIVISION II MALE AND FEMALE COLLEGIATE ATHLETES**

by

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**Introduction:** There is evidence that the competitive sport of college running may often develop into what is termed as a negative addiction. This negative addiction stemming from the competitive nature of running has the possibility of manifesting into harmful physiological and psychological outcomes such as body image and or eating disorders. **Purpose:** To compare running addiction, as measured by the Running Addiction Scale (Hailey & Bailey, 1982), between Division I and II male and/or female runners. **Methods:** A sample of convenience was used from surrounding Division I and Division II colleges in the state of Texas. Participants included (N= 131 males and females Division I: N=39 male and N=27 female and

Division II: N=33 male and 32 female) both scholarship and non scholarship athletes competing in events with a distance greater than one mile. The means for both males and females for age, years of competitive running, and running addiction scores were 20.32 ( $\pm 1.57$ ) years, 7.48 ( $\pm 2.15$ ), and 5.73 ( $\pm 2.01$ ). The means for males were 20.43 ( $\pm 1.66$ ) years, 7.22 ( $\pm 2.10$ ), and 5.27 ( $\pm 1.78$ ). Females were 20.18 ( $\pm 1.44$ ) years, 7.79 ( $\pm 2.19$ ), and 6.28 ( $\pm 2.14$ ), respectively. **Results:** Independent t-tests were used to compare the group means for all of the combinations of groups for college Divisions and Gender. There were significant differences between all comparisons of the running addiction scores. **Conclusion:** Division I runners showed a greater degree of addiction than Division II runners. Overall, the difference between genders was significant with female scores being the highest. However, no differences were found between genders in division II runners.

## CHAPTER I

### INTRODUCTION

It is well known that exercise has enormous positive mental and physical benefits. However, research has demonstrated that exercise can be both a physiologically and psychologically harmful fixation. As runners become habitual in their exercise regimen both positive and negative addictions can begin to arise. Hailey and Bailey (1982) began to study these addictions and developed a survey, Running Addiction Scale (RAS), to identify both the positive and negative aspects of habitual exercise in the form of running. Over the past few decades, the research of Hailey and Bailey into running addiction opened the door for many other researchers to investigate negative addiction and the maladaptive psychological pattern and problems that may follow (Aidman & Woollard, 2003; Bamber, Cockerill, Rodgers, & Carroll, 2000; Davis, Brewer & Ratusny, 1998; Hamer, Karageorghis, & Vlachopoulos, 2002).

Addiction can be defined by the behaviors that develop within the addiction. It is not the objects of addiction that determine the condition, but a particular intense and rigid relationship between the addict and the substance or activity of choice (Keane, 2004). Ultimately, it seems that addiction is a state marked by caring too much about the wrong

things and not enough about the right things, and thus it is unclear why only drugs and alcohol can be genuine objects of negative addiction.

Several researchers identify running as a positive addiction. Glasser (1976) labeled running as a positive addiction because of all the benefits for the body and mind. With so many positive benefits to running, Glasser confirmed that it can become an obsession. Yet, since receiving benefits he viewed the obsession as positive. The examination of running performed by Glasser was thought to provide psychological power and to increase life fulfillment, therefore he viewed the obsession as positive. Glasser believed that running was responsible for being able to overcome a negative addiction by starting to run as a substitute and recommended running to anyone who desired a positively addicting behavior.

Glasser was not the only researcher to view running addiction as positive. Sachs and Pargman (1979) used a qualitative study to investigate exercise addiction. They reported that when participants were deprived of their regular activity, withdrawal symptoms followed. However, this dependence on exercise was still viewed as a positive addiction because of the beneficial characteristics exercise held. Thaxton (1982) also found withdrawal symptoms among subjects, and that the addictive effects of running might be particularly useful in treating mental or emotional instability. Glasser (1976), Sachs and Pargman (1979), and Thaxton (1982) stimulated interest in viewing running as a positive addiction.

Sachs (1982) examined whether a commitment to exercise constituted a positive or negative addiction. He suggested a continuum in which exercise for the negatively addicted individual has progressed from an important aspect of the individual's life to a

controlling factor or negative addiction. Sachs concluded that the positively addicted runner resumes control over the activity, while the negatively addicted runner is controlled by the activity.

Several researchers have challenged running as a positive addiction and suggested that addiction and running are seen as negative (Morgan, 1979; Keane, 2004; Chan & Grossman, 1988). Recent research has suggested that any addiction, even running, has the potential to result in negative consequences. The belief that addiction speaks for a range of activities has led to various theories of addiction. Morgan (1979) and Davis (2000) claimed that exercise addiction needed to be viewed the same as other addictive type behaviors.

Morgan (1979) challenged the thought that habitual runners may have positive signs of addiction stating, "For an activity to be a negative addiction, two characteristics must be present. The individual must perform the activity in order to cope with the rest of their life and deprive the individual of the activity and withdrawal symptoms are present" (p. 5). Both characteristics can be found in addictive runners and that addiction becomes negative when an individual feels as if they cannot live without the experience of running or their "daily dose of running."

Morgan (1979) reported that exercise addiction may be no different than the addiction process in general. Sedentary individuals who adopt a jogging program may experience discomfort in the form of shortness of breath or muscle soreness and gradually increase their mileage from one to three miles per day. Many experience positive psychological changes such as decreased depression and anxiety along with an increase in self-esteem and numerous physiological changes of a positive nature. A

runner may then develop a tolerance to running and start to increase their time spent running per week. Morgan stated that many addicted runners no longer worry about work or family responsibilities because they have become obsessed with running. They begin to show maladaptive shifts of responsibility and priority. The findings of Morgan (1979) have been supported by other researchers who found that addicted runners will run regardless of rigorous injury or threats to one's health (Chan & Crossman, 1988).

Baekeland (1970) found negative addicted runners refused to be subjects during a study, even when offered money, because the experiment threatened their running schedule. The negative addictive experience may control a runner's consciousness and may even destroy a runner's ability to enjoy other activities (Peele, 1979).

Bummer (2002) found a significant relationship between exercise dependence and the years of running experience of individuals. The average days running per week appears to be a sign of the likelihood of an individual's dependence upon exercise. Performance in running events of increased distances are usually accompanied by an increased tendency toward running addiction (Pierce, McGowan, & Lynn, 1993). The relationship between running addiction and various psychological behaviors have been investigated. There are key similarities between anorexia nervosa, bulimia, body fat percent, and addictive running (Klein, et al, 2004; Brewerton, Stellefson, Hibbs, Hodges, & Cochrane, 1995; Estok & Rudy, 1996).

### Purpose of the Study

The purpose of this investigation is to compare differences using the Running Addiction Scale between Division I and Division II college-aged male and female athletes.

### Significance of the Study

Several studies have shown that consistent running can be associated with the process of what is termed a positive addiction. There is evidence that positive addiction, as seen in running, can often develop into what is termed by Hailey and Bailey (1982) as negative addiction. Negative addiction has the potential of leading to a maladaptive pattern that may be harmful to the runner. Few studies have examined running addiction among Division I and Division II collegiate athletes. Increasing awareness of negative addiction may be a critical step in helping to protect the athlete from both physiological and psychological detrimental consequences resulting from negative addiction. Athletes may be able to decrease the chances of a negative behavior from the beginning with the appropriate understanding of running addiction. Finally, the goal is to help determine when the athlete becomes negatively addicted, when to seek counseling in order to protect the athlete, as well as, maintaining participation in the sport.

### Hypotheses

1. There are no significant differences in running addiction measured by the Running Addiction Scale between Division I and Division II male and female college-aged athletes.
2. There are no significant differences in running addiction measured by the Running Addiction Scale between Division I college-aged male athletes and Division II college-aged male athletes.
3. There are no significant differences in running addiction measured by the Running Addiction Scale between Division I college-aged female athletes and Division II college-aged female athletes.

4. There are no significant differences in running addiction measured by the Running Addiction Scale between Division I college-aged male athletes and Division I college-aged female athletes.
5. There are no significant differences in running addiction measured by the Running Addiction Scale between Division II college-aged male athletes and Division II college-aged female athletes.

#### Limitations of the Study

1. The subjects of this study were selected from a sample of convenience and therefore may not be generalized to other populations.

#### Delimitations of the Study

1. All subjects will be selected from the State of Texas and currently “in season” training.
2. All subjects will be male and female Division I and Division II scholarship and non-scholarship collegiate athletes between 18-28 years old.
3. All subjects will have been competitive college runners competing in long distance running event greater than 1 mile.

#### Assumptions

1. The Running Addiction Scale is a valid and reliable instrument.
2. The subjects in this study answered honestly to all the questions on the questionnaire.
3. The subjects in this study were apparently healthy, but no controls were in place.

#### Operational Definitions

1. Exercise Addiction: Persons who demonstrate psychological and or physiological

- dependence upon a regularly experienced regime of running (Hailey & Bailey, 1982).
2. Addiction: The condition of being habitually or compulsively occupied with or involved in something (McArdle, Katch, & Katch, 2003).
  3. Dependence: The quality or state of being influenced or determined by or subject to another (McArdle, Katch, & Katch, 2003).
  4. Anorexia Nervosa: A serious illness often resulting in dangerous weight loss, in which a person, especially a girl or woman, does not eat, or eats too little, because they fear becoming fat (McArdle, Katch, & Katch, 2003).
  5. Bulimia: A serious eating disorder that occurs chiefly in females, is characterized by compulsive overeating usually followed by self-induced vomiting or laxative or diuretic abuse, and is often accompanied by guilt and depression (Webster, M. 2003).
  6. Eating Disorder: Any of several psychological disorders (as anorexia nervosa or bulimia) characterized by serious disturbances of eating behavior (Webster, M. 2003).
  7. Aerobic Exercise: Exercise that increases the need for oxygen (McArdle, Katch, & Katch, 2003).

## CHAPTER II

### REVIEW OF RELATED LITERATURE

#### Introduction

Men and women engage in running as a form of exercise for a variety of reasons. The motivation behind the runner is a complex issue. A number of investigators have explored the participative motives of runners (Deci & Ryan, 1985; Hamer et al. 2002; Johnsgard, 1985). A vast amount of research about running addiction has been confirmed that the factors and contributors to running addiction itself. Psychological and behavioral factors, as well as, sociocultural influences have all been identified as factors contributing to running addiction. Eating disorders have also been linked to exercise dependence. In addition, withdrawal symptoms are evident in the onset of most addictions, including running addiction (Galanter, 1993).

Research links a runner's commitment level to their addiction level (Masters & Lambert, 1989; Thaxton, 1982; Chapman & Castro, 1990). However, it has been argued that commitment and addiction are two different categories measuring two extremely different processes. While there are many benefits to running there are also several physical risks that are also associated with running. Runners with a negative addiction

may push themselves further than their capabilities. Thus, placing themselves at a high risk for injury.

### Motivation

A number of investigators have explored the participative motives of runners (Carmack & Martens, 1979; Curtis & McTeer, 1981; Deci & Ryan, 1985). Men and women have different reasons to start and to continue running. Individuals might begin running for one reason, then change reasons as they become more “addicted.” Running involves several physical risks that many runners ignore because an addicted runner’s motivation or drive to reach a running goal pushes them forward at all costs. Runners represent an unusual group of motivated individuals.

#### *Intrinsic and Extrinsic Motivation*

Many runners are motivated extrinsically, by participating to gain a reward, while intrinsic runners are motivated by the pure pleasure and satisfaction. There is a link between the reason an individual is motivated to run and the level of running addiction present. Deci and Ryan’s (1985) Self-Determination Theory, distinguished between intrinsically and extrinsically motivating behaviors. Deci and Ryan discussed four types of extrinsic motivation: external regulation, introjected regulation, identified regulation, and integrated regulation. Behavior is externally regulated when people participate for reasons external to the activity. Introjected regulation, which is participating because of pressures or other controlling behaviors, was also identified. Behavior that is deemed significant and highly valued to the participant is known as identified regulation. And behavior that is a choice a participant makes, such as a need, is known as integrated regulation.

Deci and Ryan (1985) learned that the self determined forms of motivation produce more positive behaviors. Therefore, claiming that the more non-self determined forms of motivation, such as introjected or external, cause the exercise dependence to be stronger in a participant. In contrast, the more self determined forms of motivation would usually not have a connection with exercise dependence.

Expanding upon the Self-Determination Theory, Hamer, Karageorghis, and Vlachopoulos (2002) also conducted a study investigating motivation linked to exercise dependence. The study involved 188 volunteers from a variety of amateur sport clubs, such as running, swimming, cycling, and a triathlon club. The Behavioral Regulation in Exercise Questionnaire (Mullan, Markland, & Ingledew, 1997) was given to all subjects to help classify participation motivation. Subjects were also given the Running Addiction Scale, developed by Hailey and Bailey (1982), to help identify characteristics of running addiction.

The results of the study were in agreement with Deci and Ryan (1985) in that the strongest predictor of exercise dependence was found to be in introjected regulation. This implies that activities which are performed because of guilt or anxiety are closely linked to exercise dependence. The study revealed that the main reason participants participated in an activity was due to intrinsic and identified reasons, rather than from external motives. Studies have also demonstrated that doing exercise for enjoyment is the least endorsed reason reported among adult men and women (Davis, Fox, Brewer, & Ratusny, 1995).

Bittiker (1977) touched upon the motivational problem with running in a piece titled "Runner's Gluttony" in which he commented,

We may begin running “just to stay in shape” but soon are seduced by the sense of clarity, energy, and self-esteem accompanying the daily run. Having achieved reasonable conditions, we run farther and faster in an attempt to find our peak. It is at this point that our tragic flaw emerges. Our gluttony may once again conquer us (p. 10).

Runners are motivated to run for various reasons. Deci and Ryan (1985) discussed four types of extrinsic motivation. It is important to note that a participant’s motivation has a direct effect on whether a participant is dependent upon exercise and a participant’s motivation for running is directly related to exercise dependence (Deci & Ryan, 1985; Hamer et al, 2002).

### *Gender Differences*

Numerous studies have examined the motivation of running between men and women. Men and women begin and maintain running for different reasons. The factors that initiated running originally could cease, while new motives for continuing running emerge.

Estok and Rudy (1987) found that initially women had a different motivation for running. Women in the study reported that they began to run because their significant other was involved with running as a form of exercise. However, once women started running on a regular basis, they were motivated to continue running on their own. Women reported greater benefits from running than men in terms of opportunities to meet people, relief from depression, and feeling less shy (Summers, Machine, & Sargent, 1983). Harris (1991) reported that women were likely to initiate and continue running as a way to help control their weight and stay fit. These are all intrinsic motivations for

running. Morgan, O'Connor, Sparling, and Pate (1987) found that female long distance runners were motivated to remain in their sport primarily by intrinsic factors. Barrel, Chamberlain, Evans, Holt, and MacKean (1989) discussed the experience of freedom, relaxation, the challenge of improvement, and getting away from daily routines as motives for running.

Johnsgard (1985) investigated the motivation of long distance runners, examined the current motives for running by both sexes, and looked at what began their running experience. One hundred and forty nine males and thirty one females from all over the United States participated in the study. The participants were given two Test of Endurance Athlete Motives (TEAM) forms to complete. Two days later, the participants were given two of the same forms to fill out again, testing reliability of the test.

The results revealed that motivation for running varies between the group's age and changes with running experience. Runners began for a specific reason, however, continued for another reason or reward. Strong motives for beginning to run for males were found to be the cardiovascular and general fitness which follow regular endurance training. The competitive aspect of running was also a strong motive for males because they want to know how they are doing in relation to other competitors. Females' current motives for running were found to be mood-regulating aspects of running. The elevated mood and reduced tension which follow endurance training and the psychological experience while training were remarkably higher for females versus males. Females enjoyed being alone, clearing their head, and experiencing themselves and the world around them while running (Masters, Ogles, & Jolton, 1993).

Males and females showed that cardiovascular and general fitness, as well as being able to control one's appetite and weight are both initial and current running motives for running. Yet, as experience grows, these motives are found to be of less importance. Running as a means to stop or control anti-life habits, such as smoking and drinking, were not found to be an important motive for beginning to run, with only a small percentage of runners running due to addiction. Weight control was found to be of more importance to younger females than older females. The study by Masters and Ogles, and Jolton (1993) found that motives for running are for "physical fitness, and weight control, to reduce tension and elevate mood, and to feel better about themselves" (p. 142). Running experience was found to have a direct correlation with motives for running. As the stronger initial motives for running decline, new motives become more powerful with running experience (Master et al., 1993).

There is evidence that desires to change a body shape or weight preoccupation are strong initiators in beginning exercising among individuals (Davis, Brewer, & Ratusny, 1998). The study found that females may be motivated to exercise for increased energy expenditure or as an attempt to achieve a desired body image. Carmack and Martens (1979) identified seven categories runners gave for running including: physical health, psychological health, self-image, affiliation, achievement, rewards, social influence, and availability. Curtis and McTeer (1981), in their study of 587 marathoners, summarized that most runners began running as a way of improving their physical or emotional health, but then move on to marathon running as part of a need for additional challenges or personal achievements. Summers and colleagues (Summers et al. 1983; Summers, Sergeant, Levey, & Murray, 1982) found goal achievement, a test of personal worth, and

physical health to be the most frequently reported reasons for running a marathon, while increasing the level of fitness was reported most frequently as the reason for initially beginning to run as a form of exercise.

Ogles, Masters, and Richardson (1995) examined the differences in motives in running between obligatory runners and recreational runners. Obligatory runners were characterized by an emphasis on reaching recognizable success, whereas recreational runners were more concerned with the physical well being and weight control. Runners involved in a Midwestern marathon, half marathon, or one of three 5K/10K races were subjects in the study. A total of 610 runners returned a packet of questionnaires within two days of the race (marathon  $n = 310$ ; half marathon  $n = 168$ ; 5K/10K  $n = 132$ ). The packet of questionnaires included the Motivation of Marathoners Scales (Masters et al. 1993) and a demographic and training information form. Behavioral conditions were used to distinguish between the obligatory runner and recreational runner.

The authors concluded that male obligatory runners were more likely to endorse competition and recognition as motives for running, while the male recreational runners endorsed more of a general health concern. Women runners were more focused on weight concerns, affiliation, life meaning, and self esteem as motives for running. Recognizable success was the distinguishing characteristic separating obligatory and recreational runners. Obligatory and recreational male runners did not differ in their endorsement of psychological coping as a reason for running. Runners in both groups were equally as likely to run as a way of coping with troubling emotions such as anxiety and as a way of easing tension.

Runners endorse different reasons for running. As a group, runners more heavily endorse developing and maintaining a level of fitness and health, including weight benefits, as reasons for running. Certain motives may lead to enhanced chances of continued participation in running over a longer period of time. As would be assumed, beginning runners are not as influenced by the notion of personal best, but participate more for general health benefits, while experienced runners endorse the achievement of running goals as the most pressing reason for running.

### *Physical Risks*

Motivation for running may be associated with injuries because those addicted may dissociate while running, ignore potentially dangerous warning signs of injury, and push themselves beyond their capabilities (Morgan, 1979). Such behaviors may place the runner at increased risk for injury. Running excessively can lead to several types of injuries.

Estok and Rudy (1987) investigated the physical risks reported by 108 male and 112 female marathon participants in Ohio. The survey instrument for the study was developed by modifying a previous instrument by Rudy and Estok (1983). One of the research questions that was addressed in the study was: "Is there a difference in incidence or kind of self-reported physical injuries by male and female marathon runners?" (Estok & Rudy, 1987, p. 81). While the researchers expected to find differences in the injuries reported by gender, the study indicated no major differences in the reported occurrences. Female runners did report more knee, hip, and heel pain injuries, but none were significantly higher than males. There were also no significant differences in male and females in the injury category of stress fractures. However, the authors did indicate a

35% and 47% rate for shin splints in men and women. Females reported higher injuries in bone fractures, whereas the males reported more metatarsal fractures.

Rudy and Estok (1987) stated that the study was conducted after an intense training time for the subjects, which could explain why there was such a high incidence of musculoskeletal injuries reported by both men and women. The data indicated a large percentage (45%) of knee injuries and shin splints (41%) as a result of training of running for both sexes. The results of the study indicated that there were no more significant physical risks involved from women running than men.

Some other injuries seen in runners were inflammation of the supporting structures of the arch, shin splints, and occasionally “compartment syndrome,” which can lead to the death of a leg muscle. The most common injuries were identified as stress fractures in the bones of the feet, tendonitis, especially in the Achilles’ tendon, knee injuries and back injuries (Morgan, Roberts, Brand, & Feinerman, 1970). Chan and Grossman (1988) examined habitual runners and came to the conclusion that exercise-dependent individuals were compelled to run even when it is socially or medically contraindicated.

There is a relationship between running addiction and running injuries. Many runners are motivated for various reasons, forgetting the physical risks involved in the activity. Addiction to running is a factor that pushes runners beyond their endurance level, beyond the point where an effective adaptive response can be made.

The explanation of why individuals are motivated to run in the first place differs greatly from one person to the next. The motivation to continue with a running routine also varies. Intrinsic and extrinsic are two extremely different motivations for running.

Addicted runners may not monitor their body signals well and may run when injured. This could explain the relationship between injuries and runners. Running that is motivated by an addictive mechanism has the potential to overpower the sensible, beneficial approach to exercise.

### Factors Associated with Running Addiction

The majority of researchers investigating exercise dependence have suggested factors that contribute to or are associated with running addiction. Sachs (1982) defined running addiction as an addiction of a psychological and/or physiological dependence on regular exercise that is characterized by withdrawal symptoms after 24 to 36 hours without exercise. Three main factors associated with running addiction are psychological factors, behavioral factors, and sociocultural factors.

#### *Psychological Factors*

The factors of running addiction are well documented, including psychological factors. Much of the existing research has focused on psychological characteristics associated with running addiction. For example, both positive and negative characteristics can be identified in running addiction.

Glasser (1976) associated positive psychological attributes with running addiction, including high levels of self-confidence and satisfaction. While regular habitual exercise has been found to constructively influence psychological well being, research examining running addicted individuals has reported a number of disconcerting psychological characteristics. Results suggested, for example, a positive relationship between running addiction and anxiety (Morgan, 1979; Rudy & Estok, 1989), in striking contrast to research which supported decreases in anxiety among seemingly non-addicted

runners (Hayden & Allen, 1984). Negative responses include irritability, feelings of guilt, anxiety, restlessness when unable to run, and neglect of family, social and work obligations, and relationships (Rudy & Estok, 1983; Carmack & Martens, 1979).

Women may experience more psychological benefits from running including enhanced self esteem, reduced anxiety, and feeling good about themselves than their counterparts (Ogles et al. 1995).

Running addiction has been noted to be positively associated with compulsiveness and rigidity, and negatively associated with self esteem (Kagen & Squires, 1985; Estok & Rudy, 1996). While these studies imply a negative basis for running addiction, the results have been disputed elsewhere. Blumenthal, Rose, and Chang (1985) reported that even the most addicted runner in their sample offered no indication of significant psychopathology. The authors found that addicted runners present positive psychological measures and those psychological measures among habitual exercisers fall within established norms.

Numerous studies have investigated the psychological effects of vigorous exercise, including anxiety reduction and enhanced self worth. Running involves negative and positive responses from both men and women. It is obvious that further research is needed to determine the extent to which running addiction can be viewed as positive characteristics or disturbing psychological characteristics.

### *Behavioral Factors*

Several studies have attempted to characterize aspects which reflect running addiction have focused primarily on the characteristics of running behavior. It seems evident that certain behaviors will lead one into the realm of running addiction. Exercise

dependence has been associated with parameters of exercise volume such as the frequency and duration of exercise maintained.

Hailey and Bailey (1982) investigated for the first time, in a quantitative assessment, the negative aspects of running addiction and at what point those characteristics can be identified as negative. Hailey and Bailey (1982) developed the Running Addiction Scale to grade the psychological characteristics associated with negative addiction. The scale is a questionnaire evaluating the motivational, emotional, and behavioral components of negative addiction. The questionnaire measured psychological rather than physiological aspects of negative addiction. The authors strategically designed the format of the questionnaire so that the subject taking it would not be able to identify their addiction level. The questionnaire was designed to ask the subject questions about their own personal running routine and the effects of running on their social life.

Sixty male volunteers who completed a five-mile run were the subjects of Hailey and Bailey's (1982) initial study. The authors found that the longer males had been running, the more negatively addicted they had become and the likelihood they would suffer withdrawal symptoms. The authors concluded a linear relationship between the length of running history and exercise dependence, which was suggested as demonstrating a progression through the stages of the development of addiction.

A study performed by Mathers and Walker (1999) examined whether exercisers were more extraverted than those who do not exercise. Subjects completed the Commitment to Physical Exercise Scale (Corbin, Nielson, Borsdorf, & Laurie, 1987) and the Negative Addiction Scale (Hailey & Bailey, 1982), allowing Mathers and Walker to

group them into different categories. A questionnaire examining extraversion and introversion levels was also distributed.

The criteria for inclusion in the groups were as follows:

- Group 1 (low commitment to exercise) scored 40 points or lower out of 60 on the Commitment to Physical Exercise Scale (the recommended cut-off) and 0 points out of 12 on the Negative Addiction Scale. Group 1 consisted of 4 men and 8 women (mean age = 19 years).
- Group 2 (high commitment to exercise, non-addicted) scored more than 40 points on the Commitment to Physical Exercise Scale and 0, 1, or 2 out of 12 on the Negative Addiction Scale. Group 2 consisted of 3 men and 9 women (mean age = 20 years).
- Group 3 (high commitment to exercise and addiction to exercise) scored more than 40 points on the Commitment to Physical Exercise Scale and 5 or more out of 12 on the Negative Addiction Scale. Group 3 consisted of 3 men and 9 women (mean age = 22 years) (Mathers & Walker, 1999).

The authors gave little support to the statement that people who are addicted to some activity are more extraverted than those who are not addicted. However, the exercisers as a group had significantly higher extraversion scores than the non exercisers. These findings imply that it is not psychological dependence on exercise that is associated with extraversion, but simply the want to exercise regularly. Kagen and Squires (1985) disagreed with the results, claiming that extraverted individuals are more likely to develop an exercise addiction.

Furst and Germone (1993) tested a total of 187 volunteers, consisting of 97

runners and 90 exercisers from a local health club to study the relationships between gender, age, years of experience, and addiction to running. The subjects were divided into groups of runners and exercisers. Subjects were asked to complete two surveys: (1) Running Addiction Scale (Hailey & Bailey, 1982) and (2) a demographic questionnaire. Gender and age showed no relevant differences between runners and exercisers.

The results of Furst and Germone (1993) agreed with the findings of Hailey and Bailey (1982). There were no major discrepancies between the runners and the exercisers. The author's final conclusion was the scores on the addiction scale were higher the longer someone participated in an activity, whether it was running or exercising. Therefore, the authors demonstrated that regardless of the type of activity, it does depend on the length of time the activity has been performed. This study provided evidence that people who participate in physical activity longer than one year are more addicted to their activity than are those who participate less than a year. Sachs and Pargman (1981) stated that it takes runners from two months to one year to become addicted. Pierce et al. (1993) concurred with the previous findings by demonstrating that participation in competitive events of increasing distance was accompanied by a linear increase in running addiction scores.

Yates (1991) contended that the obligatory runner runs as a way of establishing an identity in the midst of ongoing conflict, and that the obligatory runner is a perfectionist, anxious, and may have depressive symptoms. Addiction, commitment, compulsiveness, perfectionism, and achievement have all been hypothesized to guide or at least contribute to zealous running behaviors (Barrel, Chamberlain, Evans, Holt, & MacKean, 1989).

Chapman and Castro (1990) found that males tested above the norm for compulsiveness and obsessive behaviors, while females are above the average in interpersonal sensitivity and hostility. The authors found that the duration of an average run and frequency of running are linked to the Running Addiction Score. The score showed that addicted runners are apt to run for long durations and they do so frequently. The results indicated a shocking correlation between positive personality characteristics and addiction, and long duration running and high frequency. Low interpersonal sensitivity and phobic scores were associated with high addiction scores and high run frequencies.

The study by Chapman and Castro (1990) described the addicted male runner as one who runs quite often and for long distances, who is low in interpersonal sensitivity and who has low levels of obsessed anxiety. This reveals that running addiction is linked to positive psychological characteristics. The findings explain why positive and upbeat individuals can become addicted to running (Chapman & Castro, 1990). The authors of the study confirmed that the Running Addiction Scale (Hailey & Bailey, 1982) is a valid scale to measure running addiction. The Running Addiction Scale is a better way to measure true addiction than to measure for running enjoyment and commitment as in the Commitment to Running Scale. Thus, making the Running Addiction Scale a valid instrument in the examination of running addiction.

Kagen and Squires (1985) examined whether habitual exercisers demonstrate a personality profile similar to individuals with other dependencies, such as alcoholism. The instrument used in the study measured traits and characteristics common to a wide range of dependencies. The authors reported scores for addictive runners were equivalent

to or in excess of an alcoholic classification score. Kagen and Squires (1985) concluded that individuals were capable of becoming addicted to a regular schedule of running. Behavioral commonalities between running addiction and other syndromes of dependent behavior supported this conclusion and include a denial of problems precipitated by running behavior, adherence to running despite contraindications, and a domination by running of significant priorities such as work, family, and interpersonal relationship (Chan & Grossman, 1988; Morgan, 1979; Roberts & Elliot, 1991).

There are various studies that examine the behavioral factors associated with running addiction. Previous studies have shown that behavioral factors, such as length of years running, have a direct correlation with the negative aspects of running. Furst and Germone (1983) revealed that it did not matter what type of activity an individual takes part in because it depends on the duration of time the activity has been executed.

#### *Sociocultural Factors*

While the nature of running addiction has not been resolved, evidence exists to suggest that sociocultural factors represent a pattern of the addiction. Sociocultural factors have been proposed as a responsibility in the progression of running addiction. Women may have poorer emotional health prior to the onset of exercise. Women are hypothesized to have poorer mental health due to sociocultural expectations and role limitations. Limited outside roles are compounded by higher rates of emotional problems (McGrath, Keita, Strickland, & Russo, 1990). Eating disorders have also been linked to sociocultural factors.

Pierce, McGowan, and Lynn (1993) also used Hailey and Bailey's (1982) Negative Addiction Scale on marathon runners. The major discovery in the study was

that female marathon runners reported significantly higher exercise dependence scores than the male runners. Masters and Lambert (1989) found that a lower social approval of physical activity for women could turn into a higher perceived addiction among women. Men tended to train more (Callen, 1983), while women reported higher levels of addiction (Summers et al. 1983).

Summers et al. (1983) found that females display higher addiction levels at comparable training loads when compared to males. Rudy and Estok (1987) studied the training habits in men and women runners. The subjects were all high intensity marathon runners. While it is commonly accepted that men and women train their bodies differently, the data suggests that there is little difference in running habits based on gender. The number of days running per week and the speed were the only factors related to gender, with women running more often and men running faster.

### *Eating Disorders*

Many studies have examined the psychological aspects of exercise addiction. The most consistent findings have been the repeated direct correlation between exercise addiction and body image concerns. This includes symptoms of eating disorders. Studies have found repeatedly that excessive exercisers of both genders share several psychological characteristics with eating disorder patients: perfectionism, addictive personality traits, and greater depression, anxiety, and fatigue (Brehm & Steffen, 1998; Estok & Rudy, 1996; Ogden, Veale, & Summers, 1997).

Several studies were reviewed that found that the relationship between diet concerns and exercise addiction is stronger among women than men. However, men are not excluded from exercise addiction. Yates, Leehey, and Shisslak (1983) suggested that

habitual running is the male analogue of an eating disorder. The motivation for their exercising is focused largely on body image and weight concerns. Pope, Katz, and Hudson (1993) classified a subgroup of body builders who display a type of body-image disturbance, known as Body Dysmorphic Disorder, and whose weight lifting regime consumes huge amounts of their time and interferes with their normal daily life.

Bamber, Cockerill, and Carroll (2001) found higher levels of psychological morbidity in people with symptoms of eating disorders, particularly when they were associated with exercise dependence. Davis (1997) stated that approximately 80% of female patients with anorexia nervosa, and 50% with bulimia nervosa exercise excessively during some phase of their disorder. Davis, Kennedy, Ralevski, and Dionne (1994) found that a large proportion of patients with a disorder were involved in competitive sports or a regular exercise program before they ever began to diet. This suggests that physical activity can play a central role in the pathogenesis of eating disorders. Davis and Claridge (1998) demonstrated that both obsessional and addictive personality characteristics are present in adolescent and adult anorexia patients who exercise excessively during a weight loss phase of their disorder.

Klein et al. (2004) also investigated anorexia nervosa as it was linked to exercise dependence. The study involved women who were patients at the General Clinical Research Unit at the New York State Psychiatric Institute, being treated for anorexia nervosa. The authors of the study found that 48% of the women exhibited symptoms consistent with exercise dependence in the previous month.

Exercise holds addictive properties in persons with anorexia nervosa.

Compulsive exercisers tend to be dissatisfied with their body appearance so they exercise

to control their weight, while non-compulsive exercisers are more likely to vomit and use laxatives and have a higher binge eating frequency. Higher level runners are more likely to have an eating disorder linked with running addiction and lower in body fat. A major point of impact is that women who run 30+ miles a week are at a higher risk for anorexia nervosa (Klein et al. 2004).

Sociocultural factors have been related to running addiction. These factors contribute substantially to the addicted runner. Sociocultural factors can also influence the pathogenesis of eating disorders and their possible association with running addiction. Subsequent research has suggested that running addiction and eating disorders are linked to one another with the majority of anorexia nervosa patients struggling with exercise addiction before, during, or after various stages of the disorder.

### Habituation

A distinctive quality of acquired dependence is habituation, arising from continual exposure to a stimulating agent (Solomon, 1980). Several accounts of habitual running have suggested a habituation effect as evidenced by a need on the part of the dependent runners to increase intensity or duration of exercise to achieve satisfaction. Once a runner has formed a continual habit of running each day it transforms into a commitment to running. Researchers argue that commitment and running are not the same process and cannot be measured in the same way. Committed and addicted runners develop withdrawal symptoms when they are deprived of running (Solomon, 1980).

### *Commitment to Running*

Commitment has been linked to addiction. Many runners are committed to running at first, but their behavior soon evolves into a negative addiction. Several studies

investigate commitment to running versus addiction to running. Previous studies have shown that one can be committed to running, yet not addicted (Thaxton, 1982; Bamber et al. 2001).

Masters and Lambert (1989) examined the commitment to running, along with gender differences in a sample of marathon runners. Subjects were mailed a packet of questionnaires, such as training and demographic information and surveys to complete. The Commitment to Running Scale developed by Carmack and Martens (1979) was used and sent out in the study. The commitment to running score is based on discomfort experienced when a run is missed, length of average run, and perceived addiction to running. All subjects were instructed to return the packet within ten days of the marathon for the packet to be valid for the study.

As in previous research, the study found that training hours, finish time, and training years were all linked to an individual's commitment level of running. Men and women did not vary regarding to training hours, training years, number of previous marathons, training miles, or finish time. Women did score much higher on the commitment to running than their male counterparts did. Training years, training hours, and finish time were directly related to a male's commitment to running, whereas for females, the variables were not linked to their commitment to running. It is notable that women scored higher on the Commitment to Running Scale, yet did not vary on any of the behavioral variables.

Not all researchers agree that a runner's commitment level is representative of their addiction level. Summers et al. (1983) also used the Commitment to Running Scale (Carmack & Martens, 1979) in their study. The authors found that a runner's

commitment to running was higher among runners who scored themselves as addicted to running and had been running regularly for more than one year. The authors argued that one's addiction to running and commitment to running represents two different concepts.

Thaxton (1982) reported that commitment and addiction are two extremely different processes and that the Commitment to Running Scale (Carmack & Martens, 1979) is not reliable when measuring running addiction. Commitment to running is viewed as an incentive or an intention to continue running because of the satisfaction and enjoyment, while an addiction to running is viewed as a push or a process that forces an individual to run in spite of obstacles. Thaxton (1982) found that there was no correlation between a runner's commitment and his/her self-reported addiction scores. Bamber et al. (2001) stated that the difference in a committed runner and an addicted runner is that the committed runner enjoys and is strengthened by the exercise, whereas the addicted runner no longer takes pleasure in the exercise.

Chapman and DeCastro (1990) also examined the distinction between running addiction and running commitment. The authors also investigated the behavioral distinctiveness associated with running addiction. The authors included 50 males and females from the Georgia State University Road Runners Club. The subjects received the Running Addiction Scale (Hailey & Bailey, 1982) and Commitment to Running Scale (Carmack & Martens, 1979) to complete and return. The scores on all of the questionnaires suggested that the Running Addiction Scale is a valid measure of running addiction because it correlated strongly with self-rated addiction and moderately with discomfort for both male and female runners. The scores also revealed that the Running Addiction Scale and the Commitment to Running Scale were not the same, measuring

different characteristics of individuals. The Running Addiction Scale matched the self-rated addiction in females, but the Commitment to Running Scale did not. However, the same cannot be said of males. The Running Addiction Scale and the Commitment to Running Scale both corresponded with the self-rated addiction scores by males. This demonstrated that addiction and commitment may be the same for males, but they are of a different extent for females. Females may be committed to running without becoming addicted.

The studies reviewed revealed that commitment to running and addiction to running are two different processes requiring two different instruments of measurement. Males and females differ in commitment level and addiction levels. The Running Addiction Scale (Hailey & Bailey, 1982) is a reliable and consistent instrument to measure running addiction.

### *Exercise Withdrawal Symptoms*

Once the running habit is formed and the runner is addicted to running, individuals cannot live without the activity. Addicted runners develop withdrawal symptoms, similar to drug addiction, and the level of habituation is linked to the severity of symptoms. Exercise deprivation which causes withdrawal symptoms in runners is said to be present in, if not responsible for, the onset of most addictions.

Thaxton (1982) studied the negative impact of exercise deprivation on habitual runners. In his study, 33 habitual runners were examined. Half of the runners abstained from running for 24 hours, while the other half maintained their regular running routine. Subjects who missed their run reported a higher level of depression to those who

continued running. Thaxton concluded that even a minor interruption of training has a negative impact on the mood of a runner.

Thaxton (1982) and Aidman and Woollard (2003) examined the association between self-reported exercise addiction among competitive runners and their emotional and psychological response to a one-day deprivation from scheduled training.

Participants in the study were voluntary club-level runners who reported an average of 7.5 years of training and ran at least five times a week.

The study included 60 runners (30 male and 30 female). Participants received the Running Addiction Scale (Chapman & De Castro, 1990), and Profile of Mood States survey (McNair, Lorr, & Droppelman, 1971) two days prior to the experiment. Subjects were notified that some type of change to their regular running schedule would be required. Subjects were informed that they might have to go without training for one day with less than 24 hours notice. The experimental group consisted of 15 males and 15 females who received the notice forcing them to abstain from scheduled running. The 15 male and 15 female participants left, the control group, continued their running schedule as usual. The Profile of Mood States was given to both groups after the first 24 hours of the test.

The results are consistent with previous research (Morgan, 1979; Morris, Steinberg, Sykes, & Monti, 1988; Thaxton, 1982). The authors found that there were differences in the mood and heart rates in the experimental group only. The differences were linked to the experimental treatment, which was deprivation from the normal scheduled training runs. The level of differences among the experimental group was found to be associated with an individual's level of running addiction. The extent of the

shift in tension had the strongest correlation. There was an increase in tension reported by the runners with high addiction scores when they were forced to miss a scheduled training run. The increase in anger was the next strongest link, followed by increases in depression level. The control group showed no signs of differences in their anxiety or mood level. The experimental group reported increases in fatigue, while the control group reported significantly lower levels of fatigue.

The list of authors demonstrates that the majority of regular runners are likely to experience some degree of negative emotional and physiological symptoms when they are forced to miss a scheduled run. This is evident in the fact that there were noticeable results in the two groups after only one day of exercise deprivation. The study also found that the level of symptoms is connected to the self-reported running addiction (Thaxton, 1982).

Crossman, Jamieson, and Henderson (1999) found that a scheduled layoff from training resulted in more distress among male athletes as evaluated against female counterparts. Carmack and Martens (1979) revealed that 74% of a large sample of runners reported feelings of discomfort when they missed a run. These runners described their feelings of discomfort in five specific sensations: anxiousness, irritability or depression, the losing of training, letting self down, and sluggishness. Using an in-depth interview approach, Sachs and Pargman (1979) also found that runners felt anxious, restless, and irritated when they could not run.

In a similar manner, Robbins and Joseph (1985) found that more than 50% of a sample of runners reported some sort of deprivation sensation, including irritability, restlessness, frustration, depression, guilt, and general fatigue when they could not run for

some reason. Summers et al. (1982) asked non-elite marathoners about their feelings when they had to miss a scheduled run. The results showed that 47% of the runners felt that they let themselves down, 38% felt guilty, and 36% felt irritable, depressed, or in a bad mood.

The length of exercise deprivation is an important factor in predicting withdrawal symptoms in the exercise addict (Thaxton, 1982; Sachs & Pargman, 1979). Prolonged abstinence is sure to create extreme symptoms. Morris, Steinberg, Sykes, and Salmon (1990) observed emotional disturbances, sleep problems, and doubts about one's coping ability within one week of exercise deprivation.

Exercise addicts who are forced to stop running for a period of time often become depressed, anxious, and extremely irritable. Interpersonal relations often begin to decay in the home, work, and social settings. The depression and anxiety are normally accompanied by restlessness, insomnia, and a generalized fatigue state. Tics frequently develop. Muscle tension, and soreness occurs. There is often a decrease in appetite, constipation or irregularity become common, and in general, the many benefits frequently seen with vigorous exercise are reversed (Morgan, 1979; Aidman & Woollard, 2003).

Forming a running habit is not a terrible thing, but when the habit becomes addicting and withdrawal symptoms emerge when exercise is denied, the habit is no longer positive. Research indicates that individuals can be committed to running without being addicted. There is a difference between the two, with commitment being viewed as a positive behavior and addiction as a negative behavior. It seems evident that habitual running may develop into legitimate syndromes of dependence.

## Summary

The results cited, which studied running addiction among both males and females, suggest that while running may start off as a positive addiction, it can quickly turn into a negative, addicting behavior. Individuals may run for extrinsic or intrinsic reasons, yet research showed that running for extrinsic reasons does increase the running addiction level among participants. Men and women are motivated to start running for very different reasons. The motivations to continue to run begin to change for both genders. There are several physical risk factors involved with running. Negative addicted runners will continue to run through pain and suffering.

Several studies examined the psychological, behavioral, and sociocultural factors as being linked to running addiction. The Running Addiction Scale, by Hailey and Bailey (1982) was developed to test one's running addiction level. There is evidence that demonstrates the longer an individual participates in an activity, the higher chance of one becoming addicted. Studies show that one's addiction level can be linked to the years of experience of the activity. Exercise dependence was found to be a commonly reoccurring behavior among anorexia nervosa patients.

Many individuals form a running habit for health reasons and soon become committed to running, but for many the commitment turns to addiction. This negative addiction is noticeably present when individuals suffer withdrawal symptoms when deprived of exercise. Thaxton (1982) suggested that it can take as little as 24 hours of exercise deprivation to produce withdrawal symptoms. The majority of the studies about commitment to running agreed that an individual's commitment level and addiction level

are two different concepts. Studies demonstrate that one can be committed to running, without being addicted.

Findings were conclusive that running addiction can happen to all levels of runners. The key seems to be one of moderation and keeping one's running program in perspective (Morgan, 1979). The previous research has not considered investigating the running addiction levels of Division I and Division II male and female college aged athletes. There has been no research on the running addiction levels of a Division I athlete compared to the running addiction levels of a Division II athlete.

## CHAPTER III

### METHODS

#### Subjects

This study was approved by the Institutional Review Board (IRB) of Texas State University-San Marcos (Appendix A). The subjects were volunteers chosen from a sample of convenience from Division I and Division II schools in the State of Texas. (Division 1: 39 male and 27 female and Division II: 33 male and 32 female). The subjects consisted of both, scholarship and non-scholarship runners currently in their respective athletic training seasons. Subjects were selected based upon the following criteria: 1) between the ages of 18-28 years; 2) currently competing in collegiate running events with distances exceeding one mile; 3) apparently healthy; 4) classified as a Division I or Division II athlete.

#### Data Collection Procedures

Division I and Division II schools in Texas were contacted to determine willingness to participate. The Division I schools involved in the study were The University of Texas at Austin, Texas A&M University, and Texas State University – San Marcos. The Division II schools involved in the study were Abilene Christian University, Texas A&M Commerce, Tarleton State University, Angelo State University, and West Texas A&M. Each packet consisted of a consent form (Appendix B), Running

Addiction Scale (Appendix C), and a Subject Data Form (Appendix D). The forms were either mailed or administered to the athletes at the previously mentioned schools. Mailed questionnaires included specific instructions for the coach to administer to the athletes. Surveys were completed and mailed back via a self-addressed envelope. Instructions to participants were as follows: (1) subjects were monitored and given no more than fifteen minutes to fill out questionnaire packets; (2) subjects were not allowed to speak to each other once the packets were distributed; (3) subjects read, signed, and dated the consent form approved by the Texas State University-San Marcos IRB; (4) subjects completed the Subject Data Form and RAS; (5) immediately following completion of all questionnaires, forms were sealed in a confidential packet and mailed back to the researcher.

#### Instrumentation

1. Consent Form- document approved by Texas State University-San Marcos IRB (Appendix B) that educated the participants about risks, benefits, and their involvement in the study.
2. Running Addiction Scale- a systematic scoring system for classifying subjects as having an addiction to running (Hailey & Bailey, 1982). The Running Addiction Scale (Appendix C) addressed traits of an individual who may be associated with negative addiction to exercise, more specifically in the field of running. The questionnaire was based on assessments of emotional, motivational, physical and psychological aspects associated with the individual's own personal application of running and the effects of running on their personal and social life. The questionnaire included areas of motivation to run, running commitment,

psychological experiences derived from running, and the interpersonal and social outcomes of their degree of commitment. Participants were asked to respond to several of the questions using a five point Likert Scale ranging from strongly agree to strongly disagree. Composite scores greater than 5.2 were considered as the cut-off for having a running addiction. (Hailey & Bailey, 1982). The (RAS) is a 14-point scoring system strategically designed so that the allocated marks are not at all identifiable for the participant who conducts the survey. “The questionnaire is based around assessments of emotional, motivational, physical and psychological aspects associates with the individual’s own personal application of running and the effects of their regime on their social and interpersonal surroundings” (Hailey & Bailey, 1982).

3. Subject Data Form-The Subject Data Form is a questionnaire for classifying subjects as Division I or Division II scholarship or non-scholarship runners currently in their athletic training seasons (Appendix D). The Subject Data Form required the subjects to answer questions regarding their age, sex, and prior competitive running experience.

#### Statistical Analysis

SPSS® version 10.0 for Windows™ was used to analyze all descriptive data between the two groups. Independent t-tests were used to compare the running addiction score means for groups separated by division and/or gender. For the independent t-test between school division comparisons a two-tailed test was used to determine the level of significance between division and gender. The alpha level was set at 0.05 for all tests as the criterion value to determine the presence or absence of significant differences. The

dependent variable was the differences in the RAS. The independent variables were Division I schools, Division II schools, and male and female athletes. This was used to determine if Division I runners were significantly different in running addiction when in comparison to Division II runners, as well as comparing male runners to female runners. Levene's test for equality of variances was used for all t-tests to determine equal variances were used for all between group comparisons.

## CHAPTER IV

### RESULTS

#### Introduction

This chapter reports the analysis for the dependent variables in Division I and Division II collegiate male and female athletes with subsequent discussion of the results that were significant to the stated hypotheses. The purpose of this study was to compare the running addiction scores among Division I and Division II male and female collegiate athletes. The two groups were categorized by division of school and tested on gender and running addiction scores.

#### Descriptive Statistics of Subjects

Data were collected from both Division I and Division II male and female collegiate athletes from the state of Texas. Subjects were administered the Running Addiction Scale and Subject Data Form classifying subjects by division and gender. There were a total of 131 subjects (Division I: 39 males and 27 females and Division II: 33 males and 32 females). The combined mean values for both males and females for age, years of competitive running, and running addiction scores were 20.32 ( $\pm 1.57$ ) years, 7.48 ( $\pm 2.15$ ), and 5.73 ( $\pm 2.01$ ), respectively (Table I). The mean values and standard deviations for age and years of competitive running for the male subjects were 20.43

( $\pm 1.66$ ) years, 7.22 ( $\pm 2.10$ ), and 5.27 ( $\pm 1.78$ ), respectively (Table I). For the females, the means and standard deviations for these same variables were 20.18 ( $\pm 1.44$ ) years, 7.79 ( $\pm 2.19$ ), and 6.28 ( $\pm 2.14$ ), respectively (Table I).

The tables below are used to illustrate the difference in all measures of group means for the running addiction scores for school division and gender. The tables illustrated below report standard error of the means ( $\pm$  SE) for all of the between group mean comparisons. The standard error of the mean is described as the standard deviation of a sampling distribution of the means.

**Table 1**  
**Descriptive Statistics of all Subjects**

	<b>N</b>	<b>Age (y <math>\pm</math> SD)</b>	<b>Years of Competitive Running (y <math>\pm</math> SD)</b>	<b>Running Addiction Score (s <math>\pm</math> SD)</b>
<b>Males</b>	72	20.43 $\pm$ 1.66	7.22 $\pm$ 2.10	5.27 $\pm$ 1.78
<b>Females</b>	59	20.18 $\pm$ 1.44	7.79 $\pm$ 2.19	6.28 $\pm$ 2.14
<b>Group</b>	131	20.32 $\pm$ 1.57	7.48 $\pm$ 2.15	5.73 $\pm$ 2.01

### Hypotheses

Hypotheses were tested to determine if there were significant differences among running addiction scores between the two groups. Independent t-tests were used to analyze the data to determine if group differences existed in running addiction scores between divisions and gender. The alpha level was set at 0.05 for all tests as the criterion value to determine the presence or absence of significant differences existed.

### Results of Hypothesis 1

HO<sub>1</sub>= There are no significant differences in running addiction measured by the Running Addiction Scale between Division I and Division II male and female collegiate runners.

Comparison of the means ( $\pm$  SE) revealed significant differences between Division I and Division II collegiate male and female runners running addiction scores ( $t=4.963$ ,  $df=1$ ,  $p=.000$ ) (See Table II). Division I male and female athletes received much higher running addiction score means than did Division II male and female athletes.

**Table 2**  
**Descriptive Statistics of Division I and**  
**Division II Male and Female Athletes**

	N	RAS (Mean)	RAS (Std. Deviation)	RAS (Std. Error Mean)
<b>Division I Athletes</b>	66	6.53	$\pm 1.93$	.23
<b>Division II Athletes</b>	65	4.92	$\pm 1.77$	.21

### Results of Hypothesis 2

HO<sub>2</sub>= There are no significant differences in running addiction measured by the Running Addiction Scale between Division I collegiate male runners and Division II collegiate male runners.

Comparison of the means ( $\pm$  SE) revealed significant differences between Division I collegiate male runners and Division II collegiate male runners running addiction scores ( $t=2.95$ ,  $df=1$ ,  $p=.004$ ) (Table III). Division I male athletes received higher running addiction score means than did Division II male athletes.

**Table 3**  
**Descriptive Statistics of Division I and**  
**Division II Male Athletes**

	N	RAS (Mean)	RAS (Std. Deviation)	RAS (Std. Error Mean)
<b>Division I Males</b>	31	5.82	± 1.73	.27
<b>Division II Males</b>	33	4.63	± 1.65	.28

Results of Hypothesis 3

HO<sub>3</sub>= There are no significant differences in running addiction measured by the Running Addiction Scale between Division I collegiate female runners and Division II collegiate female runners.

Comparison of the means (± SE) revealed significant differences between Division I collegiate female runners and Division II collegiate female runners running addiction scores ( $t = .4.92$ ,  $df = 1$ ,  $p = .000$ ) (Table IV). Division I female athletes received much higher running addiction score means than did Division II female athletes.

**Table 4**  
**Descriptive Statistics of Division I and**  
**Division II Female Athletes**

	N	RAS (Mean)	RAS (Std. Deviation)	RAS (Std. Error Mean)
<b>Division I Females</b>	27	7.55	± 1.76	.33
<b>Division II Females</b>	32	5.21	± 1.86	.32

### Results of Hypothesis 4

HO<sub>4</sub>= There are no significant differences in running addiction measured by the Running Addiction Scale between Division I collegiate male runners and Division I collegiate female runners.

Comparison of the means ( $\pm$  SE) revealed significant differences between Division I collegiate male runners and Division I collegiate female runners running addiction scores ( $t = -3.976$ ,  $df = 1$ ,  $p = .000$ ) (Table V). Division I female athletes received much higher running addiction score means than did Division I male athletes.

**Table 5**  
**Descriptive Statistics of Division I**  
**Male and Female Athletes**

	<b>N</b>	<b>RAS (Mean)</b>	<b>RAS (Std. Deviation)</b>	<b>RAS (Std. Error Mean)</b>
<b>Division I Males</b>	39	5.82	$\pm 1.73$	.27
<b>Division I Females</b>	27	7.55	$\pm 1.76$	.33

### Results of Hypothesis 5

HO<sub>5</sub>= There are no significant differences in running addiction measured by the Running Addiction Scale between Division II collegiate male runners and Division II collegiate female runners.

Comparison of the means ( $\pm$  SE) revealed no significant differences between Division II collegiate male runners and Division II collegiate female runners running addiction scores ( $t = -1.33$ ,  $df = 1$ ,  $p = .187$ ) (Table VI). Division II male athletes and Division II female athletes received comparable running addiction score means.

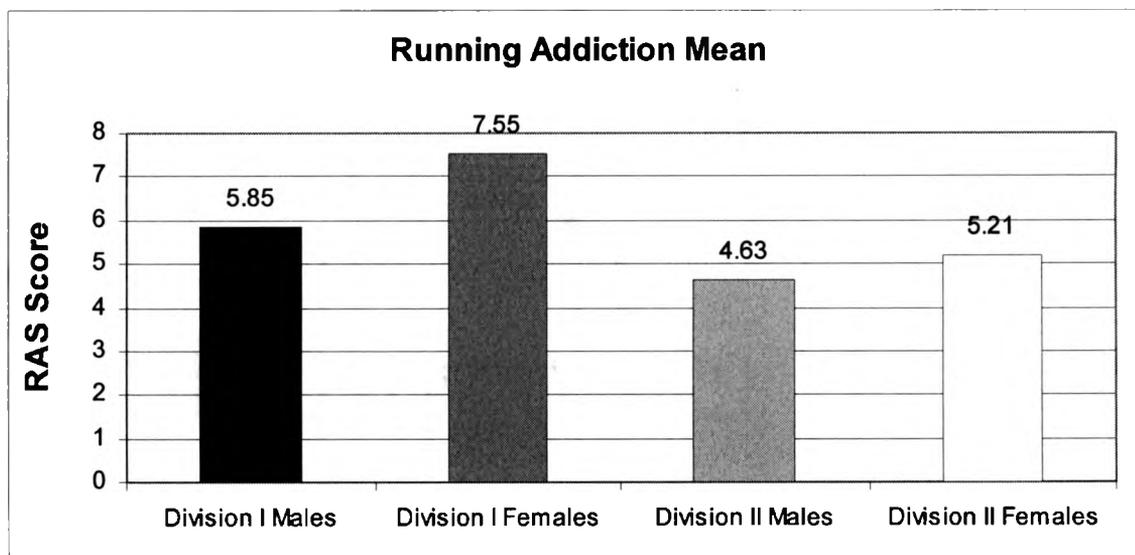
**Table 6**  
**Descriptive Statistics of Division II**  
**Male and Female Athletes**

	N	RAS (Mean)	RAS (Std. Deviation)	RAS (Std. Error Mean)
<b>Division II Males</b>	33	4.63	± 1.65	.28
<b>Division II Females</b>	32	5.21	± 1.86	.32

### Discussion of Results

The purpose was to determine if running addiction scores differed between Division I and Division II collegiate male and female athletes. The running addiction score means reported were large enough to be significantly different for several variables for the two groups (Figure 1). Division I females athletes (7.55) received the highest running addiction score means with Division II males (5.85) receiving the next highest running addiction score means. Division II females (5.21) received the third highest running addiction score means closely following the Division I males. Division II males (4.63) received the lowest running addiction score means out of any of the groups. According to the running addiction score means, Division I male and female athlete are considered more addicted to running than Division II male and female athletes. Female athletes also received higher running addiction scores means overall than did male athletes.

**Figure 1**  
**Running Addiction Means among Division and Gender**



## CHAPTER V

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

#### Summary

The purpose of this study was to compare running addiction differences using the Running Addiction Scale (Hailey & Bailey, 1982) between Division I and Division II college-aged male and female athletes. The study also examined the differences in running addiction between male and female college-aged athletes. One hundred and thirty one male and female collegiate athletes completed the Running Addiction Scale.

#### Conclusions

Within the limitations of this research, it is concluded that Division I athletes are addicted to a greater degree than Division II athletes, as well as female athletes have an increased rate of addiction when compared to males. There were significant differences between Division I and Division II male and female collegiate athletes, Division I collegiate male athletes and Division II male collegiate athletes, Division I female collegiate athletes and Division II female collegiate athletes, and Division I male collegiate athletes and Division I female collegiate athletes. The null hypothesis was rejected for the variables of gender and Running Addiction Score. There were no significant differences between Division II male and Division II female collegiate

runners. Division II male and female athletes received extremely similar running addiction score means.

Division I athletes compete at a higher, more competitive performance level than Division II athletes which has indications that Division I athletes may experience a greater amount of pressure to perform well. Deci and Ryan (1985) found that introjected motivation, which includes participation because of pressures or other controlling behaviors, can cause any type of addiction to be stronger in individuals. Division II athletes run more for recreation and pleasure, while for Division I athletes may be more competitive and focused on gaining honors and awards. Hamer, Karageorghis, and Vlachopoulos (2002) confirmed the findings of Deci and Ryan (1985), which found that the strongest predictor of running addiction was introjected regulation. This implies that activities which are performed because of guilt or anxiety are closely linked to running addiction. Division I athletes may feel extreme guilt if they do not perform to the coaches' expectation level. Division I athletes often know they must continue to be successful to maintain their scholarship. They deal with the stress of knowing that spectators, as well as athletes are watching them perform. There is probably more at stake for a Division I athlete than a Division II athlete. Half of the Division II athletes in the study were not on scholarship which means they were probably running more for internal rewards and enjoyment.

Female athletes overall were addicted to a greater extent than male athletes. Females reported greater benefits to running than men in terms of opportunities to meet people, relief from depression, and feeling less shy (Summers, Machine, & Sargent, 1983). In today's society, females also feel they have to maintain a certain body image

which is an indication of why they have a greater addiction level than males. A person's physical appearance is important to many people. Females feel this pressure on a daily basis simply by turning on the television or reading magazines. Davis, Brewer and Ratusny (1980) found that females may be motivated to run for increased energy expenditure or as an attempt to achieve a desired body image. Females are likely to run as a way to control their weight and stay fit. The elevated mood and reduced tension which follow training and the psychological experience while training were found to be remarkably higher for females versus males (Johnsgard, 1985). Summer et al. (1983) found that females display higher addiction levels at comparable training loads when compared to males. Many addicted female runners unfortunately turn to eating disorders to help them maintain the suggested female body image. Research has suggested that running addiction and eating disorders are closely linked (Pope, Katz, & Hudson, 1993; Davis, 1997; Bamber, Cockerill, & Carroll, 2001).

While the actual number of runners who fall in the running addiction category is not known, there is considerable evidence that negative addiction in runners is becoming a problem (Deci & Ryan, 1985; Hamer et al. 2002; Johnsgard, 1985). Previous research examining differences between males and females on exercise dependence has resulted in equivocal findings. Several studies have found that the relationship between weight and diet concerns and exercise dependence is stronger among women than men (Summers, Machine, & Sargent, 1983). Similar to the current investigation, other research suggests, that female athletes exhibit higher exercise dependence scores than do males (Carmack & Marten, 1979; Pierce, McGowan, & Lynn, 1993).

Master and Lambert (1989) proposed that a lower social approval of physical activity for women than men might precipitate a higher perceived addiction among women who persevere despite the cost. For example, women may have such motives for exercise participation as increased energy expenditure or an attempt to achieve a desired body image. This is supported by research which indicates that women are significantly more inclined to distort their own body image than are men (Bamber, Cockerill, & Carroll, 2001; Davis, 1997; Davis & Claridge, 1998).

When running begins to dominate the lives of runners so that they have little or no regard to physical injuries and interactions outside the running arena, the behavior can hardly be viewed as positive. This study has identified that the levels of running addiction in Division I athletes and Division II athletes is different. Further examination in the area of exercise addiction may allow fitness leaders, researchers, and coaches to identify persons who are engaging in harmful acts and who may need clinical intervention. By being aware and knowledgeable, the coaches may be able to intervene and help the individuals confront addictive behaviors before they cause injury or other negative effects.

#### Recommendations

It is recommended that further studies should be conducted comparing recreational runners to competitive runners of the same age group. This may reveal running addiction differences among the two running groups. There is a need for investigating subjects in a larger area, outside the state of Texas to help improve the strength of the study. A single running addiction test only gives a limited perspective of

one's running addiction. Testing throughout one's running years would improve the validity of the study and may need to be addressed for future research.

**APPENDIX A**

**Consent Form**

**Running Addiction Among Division I and Division II Male and Female College Age  
Long Distance Running Athletes**

**Statement of Informed Consent**

**Purpose of Study:** The purpose of the study is to identify and compare running addiction among Division I and Division II male and female college aged long distance running athletes. The study investigates exercise dependence, length of years running, gender differences in running, characteristics of running addiction, and psychological behaviors linked to running addiction.

**Description of the Test:** Upon agreeing to participate in the research study, questionnaires will be distributed, taking approximately 10 to 15 minutes to complete. The questionnaire is based around assessments of emotional, motivational, physical and psychological aspects associated with running.

**Risks:** There are no risks associated with participation in this research study.

**Benefits:** The results obtained from this research study will be added to the continually growing body of evidence about running addiction. Identifying running addiction characteristics and behaviors will be able to further prevent running addiction. By being aware and knowledgeable, coaches can intervene and help athletes confront the problem. Athletes need this information to help cope and possibly even maintain their participation in the sport.

**Subjects Rights:** If you have read this form and have decided to participate in this study, please understand your participation is voluntary and you have the right to withdraw your consent at any time without penalty. Your individual privacy will be maintained in all published and written data resulting from the study. Only you, the researcher, and the thesis supervisor will be privy to the data that is collected. All the raw data will be kept in confidence and you will not be identified by name in the study, nor will your school be identified. All of your responses from this study will be confidential and anonymous. If you have questions about your rights as a study participant, or are dissatisfied at any time with any aspect of this study, you may contact Dr. Tom Gustafson at (512) 245-2972 or Tia Wallace at (512) 353-3241. If you wish to participate in this study, please sign and date on the signature line below. Your signature indicates that you have read the above and agree to participate in this study.

Participant's Name: \_\_\_\_\_ Date: \_\_\_\_\_

Researcher's Name: \_\_\_\_\_ Date: \_\_\_\_\_

Thesis Supervisor's Name: \_\_\_\_\_ Date: \_\_\_\_\_

## APPENDIX B

### Running Addiction Scale

**Running Addiction Scale.**

**Circle the appropriate response that best describes your running behavior.**

**1.) During an average week I run**

- a) everyday      b) 6 days      c) 5 days      d) 4 days      e) it varies

**2.) On the days that I don't run I usually feel**

- a) tense      b) guilty      c) no different from other days  
d) other (please specify) \_\_\_\_\_

**3.) Since I have been running my interest and enjoyment in social activities has**

- a) increased b) decreased      c) stayed the same
- 

**4.) On the days that I don't run I feel depressed and mentally sluggish.**

- 1      2      3      4      5  
strongly agree      strongly disagree

**5.) On the days I don't run I feel deprived.**

- 1      2      3      4      5  
strongly agree      strongly disagree

**6.) If I stopped running, my physical health would decline significantly.**

- 1      2      3      4      5  
strongly agree      strongly disagree

**7.) Running is my primary form of exercise.**

- 1      2      3      4      5  
strongly agree      strongly disagree

**8.) I experience the "runner's high" on most of my runs.**

- 1      2      3      4      5  
strongly agree      strongly disagree

9.) **Running is a common topic of conversation for me.**

1      2      3      4      5  
strongly agree      strongly disagree

10.) **It is important for all runners to take some time off from their regular running regime.**

1      2      3      4      5  
strongly agree      strongly disagree

11.) **Running has influenced my lifestyle.**

1      2      3      4      5  
strongly agree      strongly disagree

12.) **My interest in running has caused some family or interpersonal tensions.**

1      2      3      4      5  
strongly agree      strongly disagree

13.) **Circle all of the responses that apply to your running behavior.**

- a) I run at approximately the same time every day.
- b) I run in unfavorable environments (rain, cold, heat).
- c) I have a consistent weekly running schedule involving the same pattern of running.
- d) I run whatever time of 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 other daily activities around what time I want to run.
- h) I am usually disciplined and do run on days that I really 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 for myself.
- k) I feel that if I don't maintain self-discipline I would stop running completely tomorrow.

Please turn the survey in when you have finished answering all the questions. Thank you for taking the time to complete the Running Addiction Scale.

**APPENDIX C**

**Subject Data Form**

### Subject Data Form

(1) Gender:    Male            Female    (please circle)

(2) Subject Age: \_\_\_\_\_ (please print)

(3) Name of University: \_\_\_\_\_  
(please print)

(4) Running Event(s): \_\_\_\_\_  
(please print)            (What events do you compete in?)

(5) Status Level:    Scholarship            Partial            Non-Scholarship  
(please circle)

(6) I have been running competitively for the past \_\_\_\_\_ years.

(7) Have you had any injuries within the past five months that prevented you from running for more than two weeks?    Yes    No    (please circle)

(8) Circle the event that you feel you are best at:

Mile            5K            10K            Marathon

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